

**Search history**

Search 1: STAC=(electronic and two-way and valve and control\* and case) (Results 154)  
Search 2: STAC=(electronic and two-way and valve and control\* and housing) (Results 119)  
Search 3: STAC=(electronic and two-way and valve and control\* and housing) (Results 119)

**Title:** Power module and methods of operation

**Abstract:** Source: US6415749B Herein disclosed is a power module comprising an air compressor chamber, an air supply valve operable to control air flow to the air compressor chamber, a combustion chamber separate from the air compressor chamber, an air storage chamber arranged between the air compressor chamber and the combustion chamber, an actuating fluid common rail, an actuating fluid compressor chamber, an actuating fluid supply valve operable to control actuating fluid flow to the actuating fluid compressor chamber, an actuating fluid storage chamber arranged between the actuating fluid compressor chamber and the actuating fluid common rail, a hydraulically-actuatable intake valve operable to control air flow to the combustion chamber, and a hydraulically-actuatable exhaust valve operable to control exhaust gas flow from the combustion chamber. Among other things, the power module provides significantly more power output than a conventional internal combustion engine of similar size.

**Classifications:**

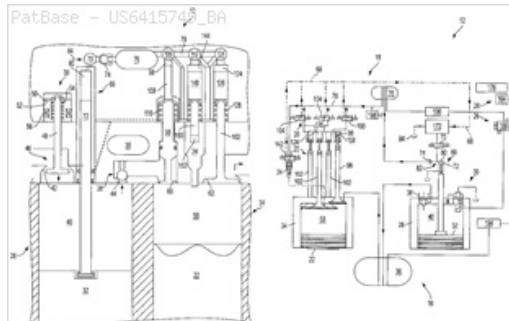
**International (IPC 8-9):** F01B1/12 F01L1/26 F01L9/02 F02B69/00 F02B75/02 (Advanced/Invention); F02B3/06 F02B33/22 F02B33/30 (Advanced/Non-invention); F01B1/00 F01L1/26 F01L9/00 F02B69/00 F02B75/02 (Core/Invention); F02B3/00 F02B33/02 (Core/Non-invention)

**International (IPC 1-7):** F01B1/12 F01L9/02 F02B33/22 F02B69/00 F02B75/02

**CPC:** Y02T10/123 F01L9/02 F01B1/12 F01L1/26 F02B3/06 F02B33/22 F02B33/30 F02B69/00 F02B75/02 F02B75/021 F02B2075/025 F02B2075/027 F02B2275/14

**European:** F01B1/12 F01L1/26 F01L9/02 F02B69/00 F02B75/02 F02B75/02C R02B275/14 R02B3/06 R02B33/22 R02B33/30 R02B75/02S2 R02B75/02S4

**US:** 123/446 123/70.00R 123/70R 123/90.12



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU200043715 A1     | 20001110         | AU20000043715      | 20000427         |
| AU200043715 A5     | 20001110         | AU20000043715D     | 20000427         |
| EP1173663 A1       | 20020123         | EP20000923624      | 20000427         |
| US6415749 BA       | 20020709         | US19990301004      | 19990427         |
| US6415749 C1       | 20091020         | US19990301004      | 19990427         |
| WO0065212 A1       | 20001102         | WO2000US11326      | 20000427         |

**Priority:**

US19990301004 19990427 WO2000US11326 20000427

**Probable Assignee:** STURMAN DIGITAL SYSTEMS LLC

**Assignee(s):** (std): DUNN RICHARD J ; STURMAN ODED EDDIE ; STURMAN ODED E

**Assignee(s):** STURMAN INDUSTRIES ; ODED EDDIE STURMAN ; RICHARD J DUNN ; STURMAN DIGITAL SYSTEMS LLC

**Inventor(s):** (std): DUNN RICHARD J ; STURMAN ODED E ; STURMAN ODED EDDIE

**Inventor(s):** ODED EDDIE STURMAN ; RICHARD J DUNN

**Designated states:** AE AL AM AT AU AZ BA BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CR CU CY CZ DE DK DM EE ES FI FR GA GB GD GE GH GM GN GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                             | Details                                                                                                                                                                                                                    |
|--------------|---------------|-------------|-------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1173663 A1 | 20020123      | LSPB        | +     | published / reissued                              |                                                                                                                                                                                                                            |
| EP1173663 A1 | 20020123      | LSSES       | +17P  | REQUEST FOR EXAMINATION FILED                     | EFFECTIVE DATE : 20011123                                                                                                                                                                                                  |
| EP1173663 A1 | 20020320      | LSAS        | RAP1  | TRANSFER OF RIGHTS OF AN EP PUBLISHED APPLICATION | OWNER NAME : STURMAN INDUSTRIES                                                                                                                                                                                            |
| EP1173663 A1 | 20050803      | LSDW        | -18D  | DEEMED TO BE WITHDRAWN                            | EFFECTIVE DATE : 20050201                                                                                                                                                                                                  |
| US6415749 BA | 20020709      | LSGT        | +     | granted / extensions (spc, cpc, pte)              |                                                                                                                                                                                                                            |
| US6415749 BA | 20020620      | LSGT        | PAT1  | Patented Case                                     |                                                                                                                                                                                                                            |
| US6415749 BA | 20060109      | LSFE        | +FPAY | FEE PAYMENT                                       | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                    |
| US6415749 BA | 20070829      | LSAS        | AS    | ASSIGNMENT                                        | OWNER NAME : STURMAN DIGITAL SYSTEMS, LLC, COLORADO<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:STURMAN, ODED E.; DUNN, RICHARD J.;<br>REEL/FRAME:019754/0624; SIGNING DATES FROM 20070615 TO 20070622 |

|              |          |      |       |                                                |                                                                                                                                                                                                                                      |
|--------------|----------|------|-------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US6415749 BA | 20071002 | LSRX | +RR   | REQUEST FOR REEXAMINATION FILED                | EFFECTIVE DATE : 20070716                                                                                                                                                                                                            |
| US6415749 BA | 20090428 | LSRE | CC    | CERTIFICATE OF CORRECTION                      |                                                                                                                                                                                                                                      |
| US6415749 BA | 20091020 | LSRX | +B1   | REEXAMINATION CERTIFICATE FIRST REEXAMINATION  | DESCRIPTION : THE PATENTABILITY OF CLAIMS 51-63 IS CONFIRMED. CLAIMS 1, 4, 9, 10, 38 AND 44 ARE CANCELLED. NEW CLAIMS 64-66 ARE ADDED AND DETERMINED TO BE PATENTABLE. CLAIMS 2, 3, 5-8, 11-37, 39-43 AND 45-50 WERE NOT REEXAMINED. |
| US6415749 BA | 20100111 | LSFE | +FPAY | FEE PAYMENT                                    | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                              |
| US6415749 BA | 20140109 | LSFE | +FPAY | FEE PAYMENT                                    | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                             |
| US6415749 BA | 20190427 | PEXP |       | Calculated Patent Term Expiry                  |                                                                                                                                                                                                                                      |
| WO0065212 A1 | 20001102 | LSPB | +     | published / reissued                           |                                                                                                                                                                                                                                      |
| WO0065212 A1 | 20011123 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE    | REF DOCUMENT NUMBER : 2000923624<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                                     |
| WO0065212 A1 | 20020123 | LSPB | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE | REF DOCUMENT NUMBER : 2000923624<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                                     |
| WO0065212 A1 | 20020228 | LSWD | REG   | REFERENCE TO NATIONAL CODE                     | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : 8642                                                                                                                                                                                 |
| WO0065212 A1 | 20040130 | LSNE | NENP  | NON-ENTRY INTO THE NATIONAL PHASE IN:          | REF COUNTRY CODE : JP                                                                                                                                                                                                                |
| WO0065212 A1 | 20050201 | LSWD | -WWW  | WIPO INFORMATION: WITHDRAWN IN NATIONAL OFFICE | REF DOCUMENT NUMBER : 2000923624<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                                     |

**Title:** DISTRIBUTOR FOR A HIGH PRESSURE FUEL SYSTEM

**Abstract:** Source: US5353766A A fuel distributor is provided which is capable of distributing fuel through plural fuel injection lines to the corresponding cylinders of a multicylinder internal combustion engine and which includes a distributor **housing** including a supply inlet passage, a plurality of fuel injection outlet passages and a plurality of distributor **valves** for providing sequential periodic fluidic communication between the supply inlet passage and the outlet passages. Each distributor **valve**, which may be cam-actuated or solenoid-actuated, is adapted to be placed in an open position to define a fuel injection period during which high pressure fuel may flow through the distributor **valve** to the respective engine cylinder and a closed position blocking fuel flow through the respective fuel injection outlet passage. Each of the distributor **valves** is adapted to receive a force from the high pressure fuel flowing from the supply inlet passage which urges the distributor **valve** into the closed position thereby providing an effective seal and minimizing leakage. The distributor may be used in a high pressure fuel system having a **control valve** positioned between a high pressure accumulator and the fuel distributor for **controlling** the flow of high pressure fuel to the distributor. The **control valve** is moveable to define a fuel injection event, occurring within the injection period provided by each distributor **valve**, during which high pressure fuel may flow from the high pressure supply means through one of the distributor **valves** to a respective engine cylinder.

**Classifications:**

**International (IPC 8-9):** F02D41/20 F02D41/38 F02M41/00 F02M41/04 F02M41/06 F02M41/14 F02M41/16 F02M45/00 F02M45/04 F02M45/12 F02M47/00 F02M47/02 F02M51/00 F02M55/02 F02M59/30 F02M59/34 F02M59/36 F02M59/44 F02M59/46 F02M63/00 F02M63/02 F04B9/06 (Advanced/Invention); F02M47/00 (Advanced/Non-invention); F02D41/20 F02D41/38 F02M41/00 F02M41/08 F02M45/00 F02M47/00 F02M47/02 F02M51/00 F02M55/02 F02M59/00 F02M59/20 F02M63/00 F04B9/02 (Core/Invention)

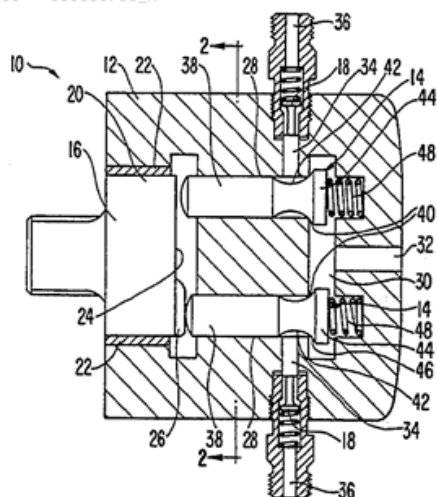
**International (IPC 1-7):** E03B65/72 F02D41/38 F02D41/40 F02M37/04 F02M41/00 F02M41/00 F02M41/04 F02M41/06 F02M41/16 F02M45/00 F02M45/02 F02M45/04 F02M47/00 F02M47/02 F02M51/00 F02M55/02 F02M59/36 F02M59/44 F02M59/46 F02M63/00 F02M63/02 F02M7/00 F04B49/00 G05D16/10

**CPC:** F02D41/3845 F02D2041/2017 F02D2041/2055 F02D2041/2058 F02D2041/224 F02D2250/02 F02M2200/04 F04B9/06 F02D41/3836 F02M41/14 F02M2200/24 F02M63/0056 F02M63/0003 F02D41/20 F02D41/3827 F02D41/408 F02D2041/225 F02D2250/31 F02M41/04 F02M41/06 F02M41/16 F02M45/04 F02M45/12 F02M51/00 F02M55/02 F02M55/025 F02M59/30 F02M59/34 F02M59/36 F02M59/44 F02M59/46 F02M59/466 F02M63/00 F02M63/0007 F02M63/0008 F02M63/0225 F02M2200/40 F04B2205/05 F04B2205/15 Y10T137/87064

**European:** F02D41/20 F02D41/38C4 F02D41/38C6 F02D41/38C6B F02M41/04 F02M41/06 F02M41/14 F02M41/16 F02M45/04 F02M45/12 F02M51/00 F02M55/02 F02M55/02B F02M59/30 F02M59/34 F02M59/36 F02M59/44 F02M59/46 F02M59/46E F02M63/00 F02M63/00C F02M63/00C3 F02M63/00C4 F02M63/00E4L F02M63/02C F04B9/06

**US:** 123/446 123/447 123/450 123/456 123/495 123/501 123/502 137/636.1 417/206

PatBase - US5353766\_R

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT178973 E         | 19990415         | AT19940917935T     | 19940506         |
| AT215178 E         | 20020415         | AT19950106632T     | 19950503         |
| AU199467859 A1     | 19941212         | AU19940067859      | 19940506         |
| AU199468282 A1     | 19941212         | AU19940068282      | 19940506         |
| AU199469458 A1     | 19941212         | AU19940069458      | 19940506         |
| BRPI9405350 A      | 19990831         | BR1994PI05350      | 19940506         |
| BRPI9501935 A      | 19951219         | BR1995PI01935      | 19950505         |
| CN1055745 C        | 20000823         | CN19941090400      | 19940506         |
| CN1056668 C        | 20000920         | CN19951007103      | 19950505         |
| CN1111065 A        | 19951101         | CN19941090400      | 19940506         |
| CN1116686 A        | 19960214         | CN19951007103      | 19950505         |
| DE69417846 D1      | 19990520         | DE19946017846      | 19940506         |
| DE69417846 T2      | 19990812         | DE19946017846T     | 19940506         |
| DE69525986 D1      | 20020502         | DE19956025986      | 19950503         |
| DE69525986 T2      | 20021219         | DE19956025986T     | 19950503         |
| EP0654122 A1       | 19950524         | EP19940917935      | 19940506         |
| EP0654122 A4       | 19960320         | EP19940917935      | 19940506         |
| EP0654122 B1       | 19990414         | EP19940917935      | 19940506         |
| EP0681100 A2       | 19951108         | EP19950106632      | 19950503         |
| EP0681100 A3       | 19980617         | EP19950106632      | 19950503         |
| EP0681100 B1       | 20020327         | EP19950106632      | 19950503         |
| EP0889233 A2       | 19990107         | EP19980118101      | 19940506         |
| EP0889233 A3       | 20000202         | EP19980118101      | 19940506         |
| GB2283533 A1       | 19950510         | GB19950000015      | 19940506         |
| GB2283533 B2       | 19960710         | GB19950000015      | 19940506         |
| GB2284024 A1       | 19950524         | GB19950000014      | 19940506         |
| GB2284024 B2       | 19970402         | GB19950000014      | 19940506         |
| GB9500014 A0       | 19950308         | GB19950000014      | 19940506         |
| GB9500015 A0       | 19950308         | GB19950000015      | 19940506         |
| JP2865588 B2       | 19990308         | JP19950109836      | 19950508         |
| JP7509042 T2       | 19951005         | JP19940525609T     | 19940506         |
| JP8042382 A2       | 19960213         | JP19950109836      | 19950508         |
| MX9403372 A1       | 19950131         | MX19940003372      | 19940506         |
| US5353766 A        | 19941011         | US19930117697      | 19930908         |
| US5404855 A        | 19950411         | US19940268669      | 19940630         |
| US5678521 A        | 19971021         | US19960633510      | 19960417         |
| US5983863 A        | 19991116         | US19950362449      | 19950616         |

|              |          |               |          |
|--------------|----------|---------------|----------|
| WO9427039 A1 | 19941124 | WO1994US05107 | 19940506 |
| WO9427040 A1 | 19941124 | WO1994US05106 | 19940506 |
| WO9427041 A1 | 19941124 | WO1994US05108 | 19940506 |

**Priority:**

|               |          |               |          |               |          |
|---------------|----------|---------------|----------|---------------|----------|
| EP19940917935 | 19940506 | US19930057489 | 19930506 | US19940268669 | 19940630 |
| US19940238859 | 19940506 | US19930057510 | 19930506 | US19930117697 | 19930908 |
| WO1994US05107 | 19940506 | US19960633510 | 19960417 | US19950362449 | 19950616 |
| WO1994US05106 | 19940506 | WO1994US05106 | 19940506 | WO1994US05108 | 19940506 |

**Probable Assignee:** CUMMINS ENGINE IP INC

**Assignee(s):** (std): CUMMINS ENGINE CO INC ; PATAKI ARPAD M ; DOSZPOLY BELA ; LANE JOHN D ; KRAUS RICHARD D ; PERR JULIUS P ; GULUK ALEXANDER G ; PETERS LESTER L ; BEALE DELANO W ; CAVANAGH MARK S ; COMINGS ENGINE CO LTD ; SWANK BRYAN W ; SHIELDS KENT V ; SAH JY JEN FRANK

**Assignee(s):** CUMMINS ENGINE CO ; COMINGS ENGINE CO ; DELANO W ; CUMMINS ENGINE IP INC ; KAMINSU ENJIN CO INC ; CUMMINS ENGINE COMPANY INC ; CUMMINS ENGINE CO INC COLUMBUS IND US ; DELANO W BEALE

**Inventor(s):** (std): BAI MAO YEN ; BRYAN W SWANK ; CAVANAGH M S ; CAVANAGH MARK ; CAVANAGH MARK S ; CAVANGH MARK S ; DABURIYU BIIRU DERANO ; DABURYU BIIRU DERANO ; DAIKAR J ; DAIKER JEFFREY ; DAIL J ; DELANO BEALE W ; DELANO W ; DELANO W BEALE ; DOSZPOLY BELA ; FRIDHOLM GREG ; GEORGE STUDDTMAN ; GREG FRIDHOLM ; GULUK ALEXANDER ; GULUK ALEXANDER G ; GURETSUGU FURAI DOHORUMU ; JEFFREY DAIKER ; JIEFURII DAIKAA ; JIYONASAN EI SUTABUNHAIMU ; JIYOOJI SUTATSUDOMAN ; JONASAN EI SUTAHNHAIMU ; JONATHON A STAVNHEIM ; JULIUS P PERR ; MEYER WILLIAM ; PATAKI A M ; PATAKI ARPAD ; PATAKI ARPAD M ; PERR JULIUS ; PERR JULIUS P ; PETERS LASTER I ; PETERS LESTER ; PETERS LESTER L ; KRAUS RICHARD ; KRAUS RICHARD D ; LANE JOHN ; LANE JOHN D ; LESTER L PETERS ; SAH FRANK JY JEN ; SAH JY JEN ; SAH JY JEN FRANK ; SANG ZHONG ; SCOTT A THOMPSON ; SHIELDS KENT ; SHIELDS KENT V ; STAHHEIM J A ; STAVNHEIM JONATHAN A ; STAVNHEIM JONATHON A ; STUDDTMAN GEORGE ; SUKOTSUTO EI TONPUSON ; SWANK B W ; SWANK BRYAN ; MAAKU JII TOOMASU ; MARK G THOMAS ; SWANK BRYAN W ; THOMAS MARK G ; THOMPSON A ; THOMPSON S A ; THOMPSON SCOTT A ; UIRIAMU MEIYAA ; W BEALE DELANO ; WILLIAM MEYER ; YEN BAI M ; YEN BAI MAO ; ZHONG SANG ; ZON SAN

**Inventor(s):** THOMPSON SA ; BEALE W DELANO ; MARK S CAVANAGH ; LASTER I PETERS ; JOOJI SUTATSUDOMAN ; JEFURII DAIKAA ; FRANK JY JEN SAH ; SAH JY JEN FRANK COLUMBUS IN 47203 US ; M S CAVANAGH ; RICHARD D KRAUS ; S A THOMPSON ; JY JEN FRANK SAH ; KENT V SHIELDS ; JOHN D LANE ; J A STAHHEIM ; J DAIKAR ; J DAIL ; DOSZPOLY BELA COLUMBUS IN 47201 US ; BELA DOSZPOLY ; A M PATAKI ; ALEXANDER G GULUK ; ARPAD M PATAKI ; B W SWANK

**Designated states:** AT AU BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CZ DE DK ES FI FR GA GB GE GN GR HU IE IT JP KG KP KR KZ LI LK LU LV MC MD MG ML MN MR MW NE NL NO NZ PL PT RO RU SD SE SI SK SN TD TG TJ TT UA US UZ VN

**Legal status (INPADOC)**

View legal status timeline

| Patent        | Date recorded | Event group | Code  | Event                                                                   | Details                                                                                   |
|---------------|---------------|-------------|-------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| AT178973 E    | 19990415      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                           |
| AT178973 E    | 19991015      | LSLE        | -RER  | CEASED AS TO PARAGRAPH 5 LIT. 3 LAW INTRODUCING PATENT TREATIES         |                                                                                           |
| AT178973 E    | 20140506      | PEXP        |       | Calculated Patent Term Expiry                                           |                                                                                           |
| AT215178 E    | 20020415      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                           |
| AT215178 E    | 20150503      | PEXP        |       | Calculated Patent Term Expiry                                           |                                                                                           |
| BRPI9405350 A | 19990831      | LSPB        | +     | published / reissued                                                    |                                                                                           |
| BRPI9405350 A | 20000425      | LSGT        | +FF   | DECISION: INTENTION TO GRANT                                            |                                                                                           |
| BRPI9405350 A | 20020514      | LSGT        | +FG9A | PATENT OR CERTIFICATE OF ADDITION GRANTED                               |                                                                                           |
| BRPI9405350 A | 20080916      | LSAS        | B25D  | REQUESTED CHANGE OF NAME OF APPLICANT APPROVED                          | OWNER NAME : CUMMINS INC. (US)<br>DESCRIPTION : ALTERADO DE: CUMMINS ENGINE COMPANY, INC. |
| BRPI9405350 A | 20100803      | LSFE        | B24C  | PATENT ANNUAL FEE: CALLING FOR RESTORATION                              | DESCRIPTION : REFERENTE A 9A,10A,11A,12A,13A,14A15A E 16A ANUIDADES.                      |
| BRPI9405350 A | 20140826      | LSLE        | -B24H | LAPSE BECAUSE OF NON-PAYMENT OF ANNUAL FEES (DEFINITELY: ART 78 IV LPI) |                                                                                           |
| BRPI9501935 A | 19951219      | LSPB        | +     | published / reissued                                                    |                                                                                           |
| BRPI9501935 A | 20001226      | LSGT        | +FF   | DECISION: INTENTION TO GRANT                                            |                                                                                           |
| BRPI9501935 A | 20010417      | LSGT        | +FG9A | PATENT OR CERTIFICATE OF ADDITION GRANTED                               |                                                                                           |
| BRPI9501935 A | 20080916      | LSAS        | B25D  | REQUESTED CHANGE OF                                                     | OWNER NAME : CUMMINS INC.                                                                 |

|               |          |      |       |                                                                                                      |                                                                                                                                                                                                           |
|---------------|----------|------|-------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |          |      |       | NAME OF APPLICANT<br>APPROVED                                                                        | (US)<br>DESCRIPTION : ALTERADO DE:<br>CUMMINS ENGINE COMPANY,<br>INC.                                                                                                                                     |
| BRPI9501935 A | 20110405 | LSFE | B24C  | PATENT ANNUAL FEE:<br>CALLING FOR<br>RESTORATION                                                     | DESCRIPTION : REFERENTE A<br>8A,9A,10A,11A,12A,13A,14A,15A<br>E 16A ANUIDADES                                                                                                                             |
| BRPI9501935 A | 20140325 | LSLE | -B24H | LAPSE BECAUSE OF<br>NON-PAYMENT OF<br>ANNUAL FEES<br>(DEFINITIVELY: ART 78<br>IV LPI)                |                                                                                                                                                                                                           |
| CN1055745 C   | 20000823 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                                              |                                                                                                                                                                                                           |
| CN1055745 C   | 19951101 | LSPB | +C06  | PUBLICATION                                                                                          |                                                                                                                                                                                                           |
| CN1055745 C   | 20000823 | LSGT | +C14  | GRANT OF PATENT OR<br>UTILITY MODEL                                                                  |                                                                                                                                                                                                           |
| CN1055745 C   | 20140702 | LSLE | -C17  | CESSATION OF PATENT<br>RIGHT                                                                         |                                                                                                                                                                                                           |
| CN1055745 C   | 20140506 | PEXP |       | Calculated Patent Term<br>Expiry                                                                     |                                                                                                                                                                                                           |
| CN1056668 C   | 20000920 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                                              |                                                                                                                                                                                                           |
| CN1056668 C   | 19960214 | LSPB | +C06  | PUBLICATION                                                                                          |                                                                                                                                                                                                           |
| CN1056668 C   | 20000920 | LSGT | +C14  | GRANT OF PATENT OR<br>UTILITY MODEL                                                                  |                                                                                                                                                                                                           |
| CN1056668 C   | 20030702 | LSLE | -C19  | LAPSE OF PATENT<br>RIGHT DUE TO NON-<br>PAYMENT OF THE<br>ANNUAL FEE                                 |                                                                                                                                                                                                           |
| CN1056668 C   | 20150505 | PEXP |       | Calculated Patent Term<br>Expiry                                                                     |                                                                                                                                                                                                           |
| CN1111065 A   | 19951101 | LSPB | +     | published / reissued                                                                                 |                                                                                                                                                                                                           |
| CN1116686 A   | 19960214 | LSPB | +     | published / reissued                                                                                 |                                                                                                                                                                                                           |
| DE69417846 D1 | 20000511 | LSGT | +8364 | NO OPPOSITION<br>DURING TERM OF<br>OPPOSITION                                                        |                                                                                                                                                                                                           |
| DE69417846 D1 | 20030515 | LSAS | 8327  | CHANGE IN THE<br>PERSON/NAME/ADDRESS<br>OF THE PATENT OWNER                                          | OWNER NAME : CUMMINS INC.,<br>COLUMBUS, IND., US                                                                                                                                                          |
| DE69417846 T2 | 19990812 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                                              |                                                                                                                                                                                                           |
| DE69417846 T2 | 20140506 | PEXP |       | Calculated Patent Term<br>Expiry                                                                     |                                                                                                                                                                                                           |
| DE69525986 D1 | 20030313 | LSLE | -8339 | CEASED/NON-PAYMENT<br>OF THE ANNUAL FEE                                                              |                                                                                                                                                                                                           |
| DE69525986 T2 | 20021219 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                                              |                                                                                                                                                                                                           |
| DE69525986 T2 | 20150503 | PEXP |       | Calculated Patent Term<br>Expiry                                                                     |                                                                                                                                                                                                           |
| EP0654122 A1  | 19950524 | LSPB | +     | published / reissued                                                                                 |                                                                                                                                                                                                           |
| EP0654122 A1  | 19950712 | LSES | +17P  | REQUEST FOR<br>EXAMINATION FILED                                                                     | EFFECTIVE DATE : 19950516                                                                                                                                                                                 |
| EP0654122 A1  | 19960320 | LSES | +A4   | DESPATCH OF<br>SUPPLEMENTARY<br>SEARCH REPORT                                                        | EFFECTIVE DATE : 19960202                                                                                                                                                                                 |
| EP0654122 A1  | 19970528 | LSES | +17Q  | FIRST EXAMINATION<br>REPORT                                                                          | EFFECTIVE DATE : 19970415                                                                                                                                                                                 |
| EP0654122 A1  | 19990414 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : NL<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 19990414 |
| EP0654122 A1  | 19990414 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : LI<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 19990414 |
| EP0654122 A1  | 19990414 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA                                                    | REF COUNTRY CODE : AT<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A                                                                                                                            |

|              |          |      |       |                                                                                                                         |                                                                                                                                                                                                           |
|--------------|----------|------|-------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO                                                                         | TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 19990414                                                                                   |
| EP0654122 A1 | 19990414 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO                    | REF COUNTRY CODE : SE<br>DESCRIPTION : THE PATENT HAS<br>BEEN ANNULLED BY A DECISION<br>OF A NATIONAL AUTHORITY<br>EFFECTIVE DATE : 19990414                                                              |
| EP0654122 A1 | 19990414 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO                    | REF COUNTRY CODE : BE<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 19990414 |
| EP0654122 A1 | 19990414 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO                    | REF COUNTRY CODE : CH<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 19990414 |
| EP0654122 A1 | 19990414 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO                    | REF COUNTRY CODE : ES<br>DESCRIPTION : THE PATENT HAS<br>BEEN ANNULLED BY A DECISION<br>OF A NATIONAL AUTHORITY<br>EFFECTIVE DATE : 19990414                                                              |
| EP0654122 A1 | 19990414 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO                    | REF COUNTRY CODE : GR<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 19990414                                                                                           |
| EP0654122 A1 | 19990415 | LSNP | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                                         | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                                                                                                                                        |
| EP0654122 A1 | 19990505 | LSGT | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                                         | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : FG4D                                                                                                                                                      |
| EP0654122 A1 | 19990506 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO                    | REF COUNTRY CODE : LU<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 19990506                                                                                           |
| EP0654122 A1 | 19990614 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO                    | REF COUNTRY CODE : IE<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 19990614                                                                                           |
| EP0654122 A1 | 19990714 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO                    | REF COUNTRY CODE : PT<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 19990714 |
| EP0654122 A1 | 19990714 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO                    | REF COUNTRY CODE : DK<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 19990714 |
| EP0654122 A1 | 19990901 | LSLE | -NLV1 | NL: LAPSED OR<br>ANNULLED DUE TO<br>FAILURE TO FULFILL<br>THE REQUIREMENTS OF<br>ART. 29P AND 29M OF<br>THE PATENTS ACT |                                                                                                                                                                                                           |
| EP0654122 A1 | 19991015 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                                         | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                                        |
| EP0654122 A1 | 20000405 | LSGT | +26N  | NO OPPOSITION FILED                                                                                                     |                                                                                                                                                                                                           |
| EP0654122 A1 | 20000503 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                                         | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : MM4A                                                                                                                                                      |
| EP0654122 A1 | 20010418 | LSFE | +PGFP | POSTGRANT: ANNUAL                                                                                                       | REF COUNTRY CODE : FR                                                                                                                                                                                     |

|              |          |      |       |                                                                                                      |                                                                                                                                                                                                           |
|--------------|----------|------|-------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | FEES PAID TO<br>NATIONAL OFFICE                                                                      | PAYMENT DATE : 20010418<br>YEAR OF FEE PAYMENT : 08                                                                                                                                                       |
| EP0654122 A1 | 20030131 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : FR<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20030131                                                                                           |
| EP0654122 A1 | 20030228 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                      | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST                                                                                                                                                        |
| EP0654122 A1 | 20080102 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : IT<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 19990414 |
| EP0654122 A1 | 20090831 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20090528<br>YEAR OF FEE PAYMENT : 16                                                                                                                              |
| EP0654122 A1 | 20091130 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20090528<br>YEAR OF FEE PAYMENT : 16                                                                                                                              |
| EP0654122 A1 | 20100831 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20100527<br>YEAR OF FEE PAYMENT : 17                                                                                                                              |
| EP0654122 A1 | 20101130 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20100525<br>YEAR OF FEE PAYMENT : 17                                                                                                                              |
| EP0654122 A1 | 20110831 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20110525<br>YEAR OF FEE PAYMENT : 18                                                                                                                              |
| EP0654122 A1 | 20110930 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20110527<br>YEAR OF FEE PAYMENT : 18                                                                                                                              |
| EP0654122 A1 | 20120731 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20120529<br>YEAR OF FEE PAYMENT : 19                                                                                                                              |
| EP0654122 A1 | 20120831 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20120525<br>YEAR OF FEE PAYMENT : 19                                                                                                                              |
| EP0654122 A1 | 20130731 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20130528<br>YEAR OF FEE PAYMENT : 20                                                                                                                              |
| EP0654122 A1 | 20130731 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20130530<br>YEAR OF FEE PAYMENT : 20                                                                                                                              |
| EP0654122 A1 | 20140507 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                      | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R071<br>REF DOCUMENT NUMBER :<br>69417846<br>COUNTRY OF REF DOCUMENT :<br>DE                                                                              |
| EP0654122 A1 | 20140528 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                      | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : PE20<br>EXPIRY DATE : 20140505                                                                                                                            |
| EP0654122 A1 | 20140731 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE BECAUSE<br>OF EXPIRATION OF<br>PROTECTION<br>EFFECTIVE DATE : 20140505                                                                                       |
| EP0654122 A1 | 20140829 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE BECAUSE<br>OF EXPIRATION OF<br>PROTECTION<br>EFFECTIVE DATE : 20140507                                                                                       |
| EP0654122 B1 | 19990414 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                                              |                                                                                                                                                                                                           |
| EP0654122 B1 | 20140506 | PEXP |       | Calculated Patent Term<br>Expiry                                                                     |                                                                                                                                                                                                           |
| EP0681100 A2 | 19951108 | LSPB | +     | published / reissued                                                                                 |                                                                                                                                                                                                           |

|              |          |       |       |                                                                                       |                                                                                                                                                                                            |
|--------------|----------|-------|-------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP0681100 A2 | 19980812 | LSSES | +17P  | REQUEST FOR EXAMINATION FILED                                                         | EFFECTIVE DATE : 19980616                                                                                                                                                                  |
| EP0681100 A2 | 19990630 | LSSES | +17Q  | FIRST EXAMINATION REPORT                                                              | EFFECTIVE DATE : 19990517                                                                                                                                                                  |
| EP0681100 A2 | 20020327 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : NL<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20020327 |
| EP0681100 A2 | 20020327 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : GR<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20020327 |
| EP0681100 A2 | 20020327 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : FR<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20020327 |
| EP0681100 A2 | 20020327 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : CH<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20020327 |
| EP0681100 A2 | 20020327 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : AT<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20020327 |
| EP0681100 A2 | 20020327 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : LI<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20020327 |
| EP0681100 A2 | 20020327 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : BE<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20020327 |
| EP0681100 A2 | 20020328 | LSNP  | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                                                                                                                         |
| EP0681100 A2 | 20020503 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : IE<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20020503                                                                               |
| EP0681100 A2 | 20020503 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : LU<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20020503                                                                               |
| EP0681100 A2 | 20020515 | LSGT  | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : FG4D                                                                                                                                       |
| EP0681100 A2 | 20020627 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : SE<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20020627 |

|              |          |      |       |                                                                                                          |                                                                                                                                                                                            |
|--------------|----------|------|-------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP0681100 A2 | 20020627 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : PT<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20020627 |
| EP0681100 A2 | 20020627 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20020627                                                                               |
| EP0681100 A2 | 20020627 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : DK<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20020627 |
| EP0681100 A2 | 20020902 | LSLE | -NLV1 | NL: LAPSED OR ANNULLED DUE TO FAILURE TO FULFILL THE REQUIREMENTS OF ART. 29P AND 29M OF THE PATENTS ACT |                                                                                                                                                                                            |
| EP0681100 A2 | 20020925 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : ES<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20020925 |
| EP0681100 A2 | 20020930 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                         |
| EP0681100 A2 | 20021203 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20021203                                                                               |
| EP0681100 A2 | 20030219 | LSLE | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                                            | EFFECTIVE DATE : 20020627                                                                                                                                                                  |
| EP0681100 A2 | 20030319 | LSGT | +26N  | NO OPPOSITION FILED                                                                                      | EFFECTIVE DATE : 20021230                                                                                                                                                                  |
| EP0681100 A2 | 20030319 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : MM4A                                                                                                                                       |
| EP0681100 A2 | 20080102 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : IT<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20020327 |
| EP0681100 B1 | 20020327 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                                     |                                                                                                                                                                                            |
| EP0681100 B1 | 20150503 | PEXP |       | Calculated Patent Term Expiry                                                                            |                                                                                                                                                                                            |
| EP0889233 A2 | 19990107 | LSPB | +     | published / reissued                                                                                     |                                                                                                                                                                                            |
| EP0889233 A2 | 20010516 | LSDW | -18D  | DEEMED TO BE WITHDRAWN                                                                                   | EFFECTIVE DATE : 20000803                                                                                                                                                                  |
| GB2283533 A1 | 19950510 | LSPB | +     | published / reissued                                                                                     |                                                                                                                                                                                            |
| GB2283533 A1 | 20041229 | LSLE | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                                                         | EFFECTIVE DATE : 20040506                                                                                                                                                                  |
| GB2283533 B2 | 19960710 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                                     |                                                                                                                                                                                            |
| GB2283533 B2 | 20140506 | PEXP |       | Calculated Patent Term Expiry                                                                            |                                                                                                                                                                                            |
| GB2284024 A1 | 19950524 | LSPB | +     | published / reissued                                                                                     |                                                                                                                                                                                            |
| GB2284024 A1 | 20130130 | LSLE | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                                                         | EFFECTIVE DATE : 20120506                                                                                                                                                                  |

|              |          |      |       |                                      |                                                                                                                                                                                                                          |
|--------------|----------|------|-------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB2284024 B2 | 19970402 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                          |
| GB2284024 B2 | 20140506 | PEXP |       | Calculated Patent Term Expiry        |                                                                                                                                                                                                                          |
| JP2865588 B2 | 19990308 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                          |
| JP2865588 B2 | 20150508 | PEXP |       | Calculated Patent Term Expiry        |                                                                                                                                                                                                                          |
| JP7509042 T2 | 19951005 | LSPB | +     | published / reissued                 |                                                                                                                                                                                                                          |
| JP8042382 A2 | 19960213 | LSPB | +     | published / reissued                 |                                                                                                                                                                                                                          |
| MX9403372 A1 | 19950131 | LSPB | +     | published / reissued                 |                                                                                                                                                                                                                          |
| MX9403372 A1 | 20140228 | LSWD | -FA   | ABANDONMENT OR WITHDRAWAL            |                                                                                                                                                                                                                          |
| US5353766 A  | 19941011 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                          |
| US5353766 A  | 19930908 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : CUMMINS ENGINE COMPANY, INC., INDIANA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:PETERS, LESTER L.; YEN, BAI MAO; PERR, JULIUS P.; REEL/FRAME:006686/0934<br>EFFECTIVE DATE : 19930831 |
| US5353766 A  | 19940929 | LSGT | PAT1  | Patented Case                        |                                                                                                                                                                                                                          |
| US5353766 A  | 19980410 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                  |
| US5353766 A  | 20011011 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : CUMMINS ENGINE IP, INC., MINNESOTA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:CUMMINGS ENGINE COMPANY, INC.; REEL/FRAME:013868/0374<br>EFFECTIVE DATE : 20001001                        |
| US5353766 A  | 20020410 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                  |
| US5353766 A  | 20060411 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                 |
| US5353766 A  | 20130908 | PEXP |       | Calculated Patent Term Expiry        |                                                                                                                                                                                                                          |
| US5404855 A  | 19950411 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                          |
| US5404855 A  | 19950331 | LSGT | PAT1  | Patented Case                        |                                                                                                                                                                                                                          |
| US5404855 A  | 19981012 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                  |
| US5404855 A  | 20011011 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : CUMMINS ENGINE IP, INC., MINNESOTA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:CUMMINGS ENGINE COMPANY, INC.; REEL/FRAME:013868/0374<br>EFFECTIVE DATE : 20001001                        |
| US5404855 A  | 20021011 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                  |
| US5404855 A  | 20061011 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                 |
| US5404855 A  | 20140630 | PEXP |       | Calculated Patent Term Expiry        |                                                                                                                                                                                                                          |
| US5678521 A  | 19971021 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                          |
| US5678521 A  | 19971007 | LSGT | PAT1  | Patented Case                        |                                                                                                                                                                                                                          |
| US5678521 A  | 20010420 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                  |
| US5678521 A  | 20011011 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : CUMMINS ENGINE IP, INC., MINNESOTA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:CUMMINGS ENGINE COMPANY, INC.; REEL/FRAME:013868/0374<br>EFFECTIVE DATE : 20001001                        |
| US5678521 A  | 20050421 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                  |
| US5678521 A  | 20090421 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                 |

|              |          |      |       |                                                |                                                                                                                                                                                                                                                            |
|--------------|----------|------|-------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US5678521 A  | 20160417 | PEXP |       | Calculated Patent Term Expiry                  |                                                                                                                                                                                                                                                            |
| US5983863 A  | 19991116 | LSGT | +     | granted / extensions (spc, cpc, pte)           |                                                                                                                                                                                                                                                            |
| US5983863 A  | 19950320 | LSAS | AS    | ASSIGNMENT                                     | OWNER NAME : CUMMINS ENGINE COMPANY, INC., INDIANA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:CAVANAGH, MARK S.; SWANK, BRYAN W.; PATAKI, ARPAD M.; AND OTHERS;<br>REEL/FRAME:007621/0482;<br>SIGNING DATES FROM 19950125 TO 19950306 |
| US5983863 A  | 19991104 | LSGT | PAT1  | Patented Case                                  |                                                                                                                                                                                                                                                            |
| US5983863 A  | 20011011 | LSAS | AS    | ASSIGNMENT                                     | OWNER NAME : CUMMINS ENGINE IP, INC., MINNESOTA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:CUMMINGS ENGINE COMPANY, INC.;<br>REEL/FRAME:013868/0374<br>EFFECTIVE DATE : 20001001                                                       |
| US5983863 A  | 20030515 | LSFE | +FPAY | FEE PAYMENT                                    | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                    |
| US5983863 A  | 20070516 | LSFE | +FPAY | FEE PAYMENT                                    | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                    |
| US5983863 A  | 20110516 | LSFE | +FPAY | FEE PAYMENT                                    | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                                                   |
| US5983863 A  | 20150616 | PEXP |       | Calculated Patent Term Expiry                  |                                                                                                                                                                                                                                                            |
| WO9427039 A1 | 19941124 | LSPB | +     | published / reissued                           |                                                                                                                                                                                                                                                            |
| WO9427039 A1 | 19960229 | LSWD | REG   | REFERENCE TO NATIONAL CODE                     | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : 8642                                                                                                                                                                                                       |
| WO9427039 A1 | 19960306 | LSNE | NENP  | NON-ENTRY INTO THE NATIONAL PHASE IN:          | REF COUNTRY CODE : CA                                                                                                                                                                                                                                      |
| WO9427040 A1 | 19941124 | LSPB | +     | published / reissued                           |                                                                                                                                                                                                                                                            |
| WO9427040 A1 | 19960306 | LSNE | NENP  | NON-ENTRY INTO THE NATIONAL PHASE IN:          | REF COUNTRY CODE : CA                                                                                                                                                                                                                                      |
| WO9427040 A1 | 19960307 | LSWD | REG   | REFERENCE TO NATIONAL CODE                     | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : 8642                                                                                                                                                                                                       |
| WO9427041 A1 | 19941124 | LSPB | +     | published / reissued                           |                                                                                                                                                                                                                                                            |
| WO9427041 A1 | 19950121 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE    | REF DOCUMENT NUMBER : 1994917935<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                                                           |
| WO9427041 A1 | 19950524 | LSPB | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE | REF DOCUMENT NUMBER : 1994917935<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                                                           |
| WO9427041 A1 | 19950616 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE    | REF DOCUMENT NUMBER : 08362449<br>COUNTRY OF REF DOCUMENT : US                                                                                                                                                                                             |
| WO9427041 A1 | 19960306 | LSNE | NENP  | NON-ENTRY INTO THE NATIONAL PHASE IN:          | REF COUNTRY CODE : CA                                                                                                                                                                                                                                      |
| WO9427041 A1 | 19960307 | LSWD | REG   | REFERENCE TO NATIONAL CODE                     | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : 8642                                                                                                                                                                                                       |
| WO9427041 A1 | 19990414 | LSGT | +WWG  | WIPO INFORMATION: GRANT IN NATIONAL OFFICE     | REF DOCUMENT NUMBER : 1994917935<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                                                           |

**Title:** MANUALLY-OPENED AND LATCHABLE WITH ONLY RESIDUAL MAGNETISM, **TWO-WAY** TWO-POSITION FLUID **CONTROL VALVE** ASSEMBLY AND METHODS OF OPERATION

**Abstract:** Source: US2004149947A Herein disclosed is a 2-way 2-position fluid **control valve** assembly operable to manually open and automatically block fluid flow therethrough. The fluid **control valve** assembly includes a **valve** and an electromagnetic actuator having an armature and a pole piece. The **valve** is biased to its closed position whereat the armature is spaced away from the pole piece. The armature is manually movable to contact the pole piece while opening the **valve**. The armature and the pole piece are latchable together, with only residual magnetism, only when there is zero air gap or substantially zero air gap between the armature and the pole piece. When latched, the armature and the pole piece remain in that state until they are delatched by canceling at least enough of the residual magnetism so that the biased **valve** closes while the armature moves away from the pole piece. Methods of operating the **control valve** assembly are also disclosed. The subject invention advantageously provides a **two-way** two-position fluid **control valve** assembly for automatically shutting off fluid flow in various household and commercial applications. The **control valve** assembly advantageously features simplicity of design and operation, energy efficiency, reliability, and relatively low cost to manufacture.

**Classifications:**

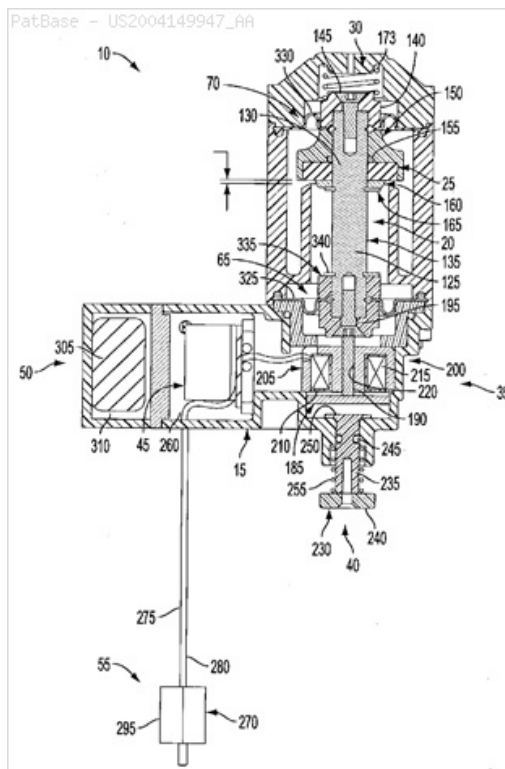
**International (IPC 8-9):** F16K11/24 F16K31/05 (Advanced/Invention); F16K11/10 F16K31/05 (Core/Invention)

**International (IPC 1-7):** F16K31/02 F16K31/06

**CPC:** F16K11/24 F16K31/05

**European:** F16K11/24 F16K31/05

**US:** 251/129.05 251/129.16 251/68 251/74



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU2003282681 AA    | 20040830         | AU20030282681      | 20031027         |
| US2004149947 AA    | 20040805         | US20030356177      | 20030201         |
| US6820856 BB       | 20041123         | US20030356177      | 20030201         |
| WO04070244 A1      | 20040819         | WO2003US31520      | 20031027         |

**Priority:**

US20030356177 20030201 WO2003US31520 20031027

**Probable Assignee:** STURMAN DIESEL PRODUCTS LLC

**Assignee(s):** (std): GRILL BENJAMIN ; STURMAN BG LLC

**Assignee(s):** STURMAN DIESEL PRODUCTS LLC

**Inventor(s):** (std): GRILL BENJAMIN

**Inventor(s):** BENJAMIN GRILL

**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code | Event                | Details                                                                 |
|-----------------|---------------|-------------|------|----------------------|-------------------------------------------------------------------------|
| AU2003282681 AA | 20051020      | LSLE        | -MK6 | APPLICATION LAPSED   | SECTION 142(2)(F)/REG. 8.3(3) - PCT APPLIC. NOT ENTERING NATIONAL PHASE |
| US2004149947 AA | 20040805      | LSPB        | +    | published / reissued |                                                                         |
| US6820856 BB    | 20041123      | LSGT        | +    | granted / extensions | (spc, cpc, pte)                                                         |

|               |          |      |       |                                                                                  |                                                                                                                                                                                                                        |
|---------------|----------|------|-------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US6820856 BB  | 20030201 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : STURMAN BG,<br>LLC, COLORADO<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:GRILL,<br>BENJAMIN;<br>REEL/FRAME:013730/0783<br>EFFECTIVE DATE :<br>20030131                 |
| US6820856 BB  | 20030219 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : STURMAN BG,<br>LLC, COLORADO<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:GRILL,<br>BENJAMIN;<br>REEL/FRAME:013762/0815<br>EFFECTIVE DATE :<br>20030211                 |
| US6820856 BB  | 20080523 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                |
| US6820856 BB  | 20120523 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                |
| US6820856 BB  | 20121231 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : STURMAN DIESEL<br>PRODUCTS, LLC,<br>COLORADO<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:STURMAN BG,<br>LLC;<br>REEL/FRAME:029550/0654<br>EFFECTIVE DATE :<br>20121126 |
| US6820856 BB  | 20161123 | LSLE | -LAPS | LAPSE FOR FAILURE TO<br>PAY MAINTENANCE FEES                                     |                                                                                                                                                                                                                        |
| US6820856 BB  | 20161219 | LSLE | -PEX1 | Patent Expired Due to<br>NonPayment of<br>Maintenance Fees Under<br>37 CFR 1.362 |                                                                                                                                                                                                                        |
| US6820856 BB  | 20170110 | LSLE | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE                              | EFFECTIVE DATE :<br>20161123                                                                                                                                                                                           |
| US6820856 BB  | 20230615 | PEXP |       | Calculated Patent Term<br>Expiry (PTA 134 days)                                  |                                                                                                                                                                                                                        |
| WO04070244 A1 | 20040819 | LSPB | +     | published / reissued                                                             |                                                                                                                                                                                                                        |
| WO04070244 A1 | 20070105 | LSNE | NENP  | NON-ENTRY INTO THE<br>NATIONAL PHASE IN:                                         | REF COUNTRY CODE : JP                                                                                                                                                                                                  |
| WO04070244 A1 | 20070105 | LSWD | -WWW  | WIPO INFORMATION:<br>WITHDRAWN IN<br>NATIONAL OFFICE                             | COUNTRY OF REF<br>DOCUMENT : JP                                                                                                                                                                                        |

**Title:** ELECTRONICALLY-CONTROLLED FLUID INJECTOR SYSTEM HAVING PRE-INJECTION PRESSURIZABLE FLUID STORAGE CHAMBER AND DIRECT-OPERATED CHECK

**Abstract:** Source: US5551398A An improved electronically-controlled fluid injector system comprises a fluid storage chamber and a direct-operated check. Pressurization of fluid in the storage chamber begins before the start of fluid injection. Fluid injection begins by hydraulically unbalancing the check. Fluid injection sharply ends by hydraulically balancing the check to allow a biasing device to close the check. The present invention provides improved control of several fluid injection parameters, including higher peak fluid injection capability and less fluid injection pressure drop at the end of injection, resulting in improved engine performance and lower emissions, noise, and wear.

**Classifications:**

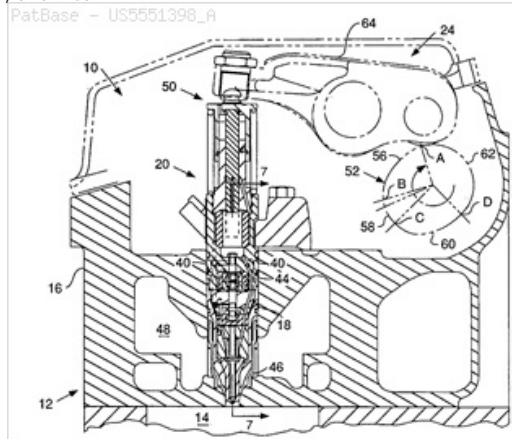
**International (IPC 8-9):** F02M45/04 F02M47/02 F02M51/00 F02M57/02 F02M59/10 F02M59/36 F02M59/46 (Advanced/Invention); F02M45/00 F02M47/02 F02M51/00 F02M57/00 F02M59/00 F02M59/20 (Core/Invention)

**International (IPC 1-7):** F02M37/04 F02M47/00 F02M47/02 F02M51/00 F02M57/02 F02M59/46 F02M63/00

**CPC:** Y02T10/123 F02M45/04 F02M63/0047 F02B2275/14 F02M47/027 F02M57/02 F02M57/023 F02M59/102 F02M59/366 F02M59/466 F02M63/0015 F02M63/0017 F02M63/0049 F02M63/0061 F02M63/0064

**European:** F02M47/02D F02M57/02 F02M57/02C1 F02M59/10B F02M59/36D F02M59/46E F02M59/46E2 F02M63/00E10B F02M63/00E10F F02M63/00E2B F02M63/00E2B1 F02M63/00E4G F02M63/00E4H R02B275/14

**US:** 123/446 123/496 123/500 123/506 239/585.2 239/88



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CA2145709 AA       | 19951114         | CA19952145709      | 19950328         |
| DE19517578 A1      | 19951116         | DE19951017578      | 19950512         |
| DE19517578 B4      | 20081211         | DE19951017578      | 19950512         |
| GB2289313 A1       | 19951115         | GB19950006193      | 19950327         |
| GB2289313 B2       | 19980930         | GB19950006193      | 19950327         |
| GB2320288 A1       | 19980617         | GB19980001375      | 19950327         |
| GB2320288 B2       | 19980930         | GB19980001375      | 19950327         |
| GB2320289 A1       | 19980617         | GB19980001379      | 19950327         |
| GB2320289 B2       | 19980930         | GB19980001379      | 19950327         |
| GB2320290 A1       | 19980617         | GB19980001383      | 19950327         |
| GB2320290 B2       | 19980930         | GB19980001383      | 19950327         |
| GB2320291 A1       | 19980617         | GB19980001387      | 19950327         |
| GB2320291 B2       | 19980930         | GB19980001387      | 19950327         |
| GB2320292 A1       | 19980617         | GB19980001389      | 19950327         |
| GB2320292 A8       | 19980708         | GB19980001389      | 19950327         |
| GB2320292 B2       | 19980930         | GB19980001389      | 19950327         |
| GB9506193 A0       | 19950517         | GB19950006193      | 19950327         |
| GB9801375 A0       | 19980318         | GB19980001375      | 19950327         |
| GB9801379 A0       | 19980318         | GB19980001379      | 19950327         |
| GB9801383 A0       | 19980318         | GB19980001383      | 19950327         |
| GB9801387 A0       | 19980318         | GB19980001387      | 19950327         |
| GB9801389 A0       | 19980318         | GB19980001389      | 19950327         |
| JP7310623 A2       | 19951128         | JP19950112973      | 19950511         |
| US5551398 A        | 19960903         | US19950438858      | 19950510         |
| US5628293 A        | 19970513         | US19950524144      | 19950831         |

**Priority:**

CA19952145709 19950328 GB19950006193 19950327 US19950438858 19950510  
US19950524144 19950831 US19940242501 19940513

**Probable Assignee:** CATERPILLAR INC

**Assignee(s):** (std): CATERPILLAR INC

**Assignee(s):** CATERPILLAR INC PEORIA ILL US ; GIBSON DENNIS H ; HEFLER GREGORY W ; SHINOGLER RONALD D ; SOMMARS MARK F ; CANNON HOWARD N

**Inventor(s):** (std): GIBSON DENNIS H ; HEFLER GREGORY W ; SHINOGLER RONALD D ; SOMMARS MARK F ; RONARUDO DEII SHINOOGURU ; GUREGORII DABURIYUU HEFURAA ; MAAKU EFU SOOMAAZU ; DENISU EICHI GIBUSON ; CANNON HOWARD N

**Inventor(s):** HOWARD N CANNON ; GREGORY W HEFLER ; DENNIS H GIBSON ; RONALD D SHINOGLER ; MARK F SOMMARS

**Agent(s):** KIRBY EADES GALE BAKER; SHISHIDO KAICHI; MURAKOSO HIROO; TAKEUCHI HIDETO; OHTSUKA FUMIAKI; IMASHIRO TOSHIO; NAKAMURA MINORU; OGAWA NOBUO

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                | Details |
|--------------|---------------|-------------|-------|----------------------|---------|
| CA2145709 AA | 19951114      | LSPB        | +     | published / reissued |         |
| CA2145709 AA | 20000328      | LSLE        | -FZDE | DEAD                 |         |

|               |          |       |       |                                                                 |                                                                      |
|---------------|----------|-------|-------|-----------------------------------------------------------------|----------------------------------------------------------------------|
| DE19517578 A1 | 19951116 | LSPB  | +     | published / reissued                                            |                                                                      |
| DE19517578 A1 | 20020606 | LSSES | +8110 | REQUEST FOR EXAMINATION PARAGRAPH 44                            |                                                                      |
| DE19517578 A1 | 20090604 | LSGT  | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                         |                                                                      |
| DE19517578 A1 | 20100325 | LSLE  | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                            |                                                                      |
| DE19517578 B4 | 20081211 | LSGT  | +     | granted / extensions (spc, cpc, pte)                            |                                                                      |
| DE19517578 B4 | 20150512 | PEXP  |       | Calculated Patent Term Expiry                                   |                                                                      |
| GB2289313 A1  | 19951115 | LSPB  | +     | published / reissued                                            |                                                                      |
| GB2289313 A1  | 20101124 | LSLE  | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                | EFFECTIVE DATE : 20100327                                            |
| GB2289313 B2  | 19980930 | LSGT  | +     | granted / extensions (spc, cpc, pte)                            |                                                                      |
| GB2289313 B2  | 20150327 | PEXP  |       | Calculated Patent Term Expiry                                   |                                                                      |
| GB2320288 A1  | 19980617 | LSPB  | +     | published / reissued                                            |                                                                      |
| GB2320288 A1  | 20101124 | LSLE  | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                | EFFECTIVE DATE : 20100327                                            |
| GB2320288 B2  | 19980930 | LSGT  | +     | granted / extensions (spc, cpc, pte)                            |                                                                      |
| GB2320288 B2  | 20150327 | PEXP  |       | Calculated Patent Term Expiry                                   |                                                                      |
| GB2320289 A1  | 19980617 | LSPB  | +     | published / reissued                                            |                                                                      |
| GB2320289 A1  | 20101124 | LSLE  | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                | EFFECTIVE DATE : 20100327                                            |
| GB2320289 B2  | 19980930 | LSGT  | +     | granted / extensions (spc, cpc, pte)                            |                                                                      |
| GB2320289 B2  | 20150327 | PEXP  |       | Calculated Patent Term Expiry                                   |                                                                      |
| GB2320290 A1  | 19980617 | LSPB  | +     | published / reissued                                            |                                                                      |
| GB2320290 A1  | 20101124 | LSLE  | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                | EFFECTIVE DATE : 20100327                                            |
| GB2320290 B2  | 19980930 | LSGT  | +     | granted / extensions (spc, cpc, pte)                            |                                                                      |
| GB2320290 B2  | 20150327 | PEXP  |       | Calculated Patent Term Expiry                                   |                                                                      |
| GB2320291 A1  | 19980617 | LSPB  | +     | published / reissued                                            |                                                                      |
| GB2320291 A1  | 20101124 | LSLE  | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                | EFFECTIVE DATE : 20100327                                            |
| GB2320291 B2  | 19980930 | LSGT  | +     | granted / extensions (spc, cpc, pte)                            |                                                                      |
| GB2320291 B2  | 20150327 | PEXP  |       | Calculated Patent Term Expiry                                   |                                                                      |
| GB2320292 A1  | 19980617 | LSPB  | +     | published / reissued                                            |                                                                      |
| GB2320292 A1  | 20101124 | LSLE  | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                | EFFECTIVE DATE : 20100327                                            |
| GB2320292 B2  | 19980930 | LSGT  | +     | granted / extensions (spc, cpc, pte)                            |                                                                      |
| GB2320292 B2  | 20150327 | PEXP  |       | Calculated Patent Term Expiry                                   |                                                                      |
| JP7310623 A2  | 19951128 | LSPB  | +     | published / reissued                                            |                                                                      |
| JP7310623 A2  | 20020806 | LSWD  | -A300 | WITHDRAWAL OF APPLICATION BECAUSE OF NO REQUEST FOR EXAMINATION | TEXT : JAPANESE INTERMEDIATE CODE: A300<br>EFFECTIVE DATE : 20020806 |
| US5551398 A   | 19960903 | LSGT  | +     | granted / extensions (spc, cpc, pte)                            |                                                                      |

|             |          |      |       |                                      |                                                                                                                                                                                    |
|-------------|----------|------|-------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US5551398 A | 19950711 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : CATERPILLAR INC., ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR: CANNON, HOWARD N.;<br>REEL/FRAAME:007556/0657<br>EFFECTIVE DATE : 19950705 |
| US5551398 A | 19960628 | LSGT | PAT1  | Patented Case                        |                                                                                                                                                                                    |
| US5551398 A | 19970114 | LSRE | CC    | CERTIFICATE OF CORRECTION            |                                                                                                                                                                                    |
| US5551398 A | 19991116 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                            |
| US5551398 A | 20040226 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                            |
| US5551398 A | 20080221 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                           |
| US5551398 A | 20150510 | PEXP |       | Calculated Patent Term Expiry        |                                                                                                                                                                                    |
| US5628293 A | 19970513 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                    |
| US5628293 A | 19970502 | LSGT | PAT1  | Patented Case                        |                                                                                                                                                                                    |
| US5628293 A | 20000821 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                            |
| US5628293 A | 20040929 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                            |
| US5628293 A | 20080918 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                           |
| US5628293 A | 20150831 | PEXP |       | Calculated Patent Term Expiry        |                                                                                                                                                                                    |

Title: **ELECTRONIC CONTROL** SYSTEM FOR A VEHICLE

**Abstract:** Source: US2010222955A An **electronic control** system for a vehicle having plural device actuators, each device being configured to provide an output signal indicative of its actuation status, the vehicle also having inputs for requesting actuation of the respective devices and generating corresponding actuation request signals, and vehicle condition sensors for providing vehicle condition signals indicative of vehicle parameters such as speed and tilt or the status of vehicle components; the system comprising: a slave **controller** associated with each device; and a master **controller**; the master and slave **controllers** all being connected to receive the vehicle condition signals, the master **controller** being connected to receive the actuation request signals and to receive the status output signals from all the devices and being in **two-way** data communication with all the slave **controllers**, and each slave **controller** being connected to receive a corresponding actuation request signal and to receive power from the master **controller** and to provide power to its respective device; each slave **controller** being responsive to an actuation request signal requesting actuation of its device to send a slave request signal to the master **controller**, and the master **controller** being responsive to the slave request signal provide a master consent signal to the slave **controller** only if it has independently received the same actuation request signal and it determines that it is safe and appropriate to do so, and to supply power to the slave **controller**; and the slave **controller** being responsive to the master consent signal and the relevant vehicle condition signals and the respective status output signal to supply power to the device to **control** the actuation of the device only in the event that it determines that it is safe and appropriate to do so.

**Classifications:**

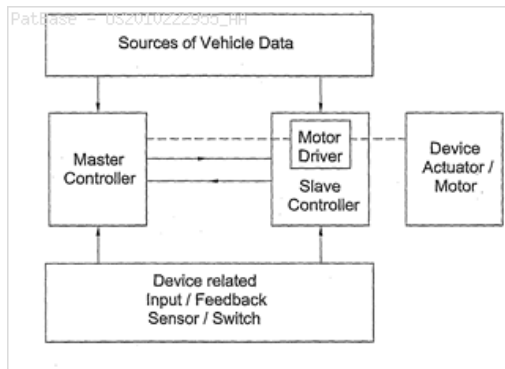
**International (IPC 8-9):** B60R16/02 B60R16/023 B60R25/02  
B60W10/00 B60W10/20 B60W10/30 E05B65/12 (Advanced/Invention);  
B60R16/02 B60R25/02 B60W10/00 B60W10/20  
B60W10/30 (Core/Invention)

**International (IPC 1-7):** B60R25/02

**CPC:** B60R16/0231 B60R16/023

**European:** B60R16/023 B60R16/023D E05B65/12D

**US:** 701/29 701/31.4 701/31.400P



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT441559 E         | 20090915         | AT20070700363T     | 20070111         |
| CN101370693 A      | 20090218         | CN200780002854     | 20070111         |
| DE602007002274 D1  | 20091015         | DE200760002274T    | 20070111         |
| EP1976734 A1       | 20081008         | EP20070700363      | 20070111         |
| EP1976734 B1       | 20090902         | EP20070700363      | 20070111         |
| GB200601343 A0     | 20060301         | GB20060001343      | 20060123         |
| GB2435939 A1       | 20070912         | GB20060001343      | 20060123         |
| IN05792DN2008 A    | 20081024         | IN2008DN05792      | 20080703         |
| US2010222955 AA    | 20100902         | US20070160077      | 20070111         |
| WO07083085 A1      | 20070726         | WO2007GB00073      | 20070111         |

**Priority:**

GB20060001343 20060123 WO2007GB00073 20070111

**Probable Assignee:** CHEVALIER JOHN P

**Assignee(s):** (std): CHEVALIER JOHN P ; CHEVALIER JOHN PHILLIP ; PHILLIP CHEVALIER JOHN

**Assignee(s):** JOHN PHILLIP CHEVALIER

**Inventor(s):** (std): CHEVALIER JOHN PHILLIP ; PHILLIP CHEVALIER JOHN

**Inventor(s):** JOHN PHILLIP CHEVALIER

**Agent(s):** MAURY RICHARD PHILIP; JENNINGS NIGEL ROBIN; DICKSTEIN SHAPIRO LLP

**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MD MG MK ML MN MR MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

**Legal status (INPADOC)**

View legal status timeline

| Patent        | Date recorded | Event group | Code | Event                | Details                                                  |
|---------------|---------------|-------------|------|----------------------|----------------------------------------------------------|
| AT441559 E    | 20090915      | LSGT        | +    | granted / extensions | (spc, cpc, pte)                                          |
| AT441559 E    | 20100315      | LSLE        | -RER | CEASED AS TO         | PARAGRAPH 5 LIT. 3<br>LAW INTRODUCING<br>PATENT TREATIES |
| AT441559 E    | 20270111      | PEXP        |      | Calculated Patent    | Term Expiry                                              |
| CN101370693 A | 20090218      | LSPB        | +    | published / reissued |                                                          |
| CN101370693 A | 20090218      | LSPB        | +C06 | PUBLICATION          |                                                          |
| CN101370693 A | 20090930      | LSDW        | -C02 | DEEMED               | WITHDRAWAL OF                                            |

|                   |          |       |       | PATENT APPLICATION<br>AFTER PUBLICATION<br>(PATENT LAW 2001)                                                            |                                                                                                                                                                                                           |
|-------------------|----------|-------|-------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DE602007002274 D1 | 20100923 | LSGT  | +8364 | NO OPPOSITION<br>DURING TERM OF<br>OPPOSITION                                                                           |                                                                                                                                                                                                           |
| EP1976734 A1      | 20081008 | LSPB  | +     | published / reissued                                                                                                    |                                                                                                                                                                                                           |
| EP1976734 A1      | 20081008 | LSSES | +17P  | REQUEST FOR<br>EXAMINATION FILED                                                                                        | EFFECTIVE DATE : 20080618                                                                                                                                                                                 |
| EP1976734 A1      | 20090915 | LSNP  | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                                         | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                                                                                                                                        |
| EP1976734 A1      | 20090930 | LSGT  | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                                         | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE :<br>FG4D                                                                                                                                                   |
| EP1976734 A1      | 20100201 | LSLE  | -NLV1 | NL: LAPSED OR<br>ANNULLED DUE TO<br>FAILURE TO FULFILL<br>THE REQUIREMENTS<br>OF ART. 29P AND 29M<br>OF THE PATENTS ACT |                                                                                                                                                                                                           |
| EP1976734 A1      | 20100225 | LSRV  | -LTIE | LT: INVALIDATION OF<br>EUROPEAN PATENT<br>OR PATENT<br>EXTENSION                                                        | EFFECTIVE DATE : 20090902                                                                                                                                                                                 |
| EP1976734 A1      | 20100430 | LSLE  | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO                    | REF COUNTRY CODE : CY<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1      | 20100430 | LSLE  | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO                    | REF COUNTRY CODE : EE<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1      | 20100430 | LSLE  | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO                    | REF COUNTRY CODE : ES<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20091213 |
| EP1976734 A1      | 20100430 | LSLE  | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO                    | REF COUNTRY CODE : FI<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1      | 20100430 | LSLE  | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO                    | REF COUNTRY CODE : LT<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1      | 20100430 | LSLE  | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO                    | REF COUNTRY CODE : LV<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1      | 20100430 | LSLE  | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO                    | REF COUNTRY CODE : NL<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1      | 20100430 | LSLE  | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO                    | REF COUNTRY CODE : PL<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO                                                                                 |

|              |          |      |       |                                                                                                      |                                                                                                                                                                                                           |
|--------------|----------|------|-------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | TO EPO                                                                                               | PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902                                                                                                                              |
| EP1976734 A1 | 20100430 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : SE<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1 | 20100430 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : SI<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1 | 20100630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : PT<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20100104 |
| EP1976734 A1 | 20100630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : RO<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1 | 20100630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : SK<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1 | 20100630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : CZ<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1 | 20100630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : IS<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20100102 |
| EP1976734 A1 | 20100630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : AT<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1 | 20100630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : BE<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1 | 20100630 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20100107<br>YEAR OF FEE PAYMENT : 04                                                                                                                              |
| EP1976734 A1 | 20100730 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : DK<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |

|              |          |      |       |                                                                                                      |                                                                                                                                                                                                           |
|--------------|----------|------|-------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1976734 A1 | 20100811 | LSGT | +26N  | NO OPPOSITION<br>FILED                                                                               | EFFECTIVE DATE : 20100603                                                                                                                                                                                 |
| EP1976734 A1 | 20100930 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : MC<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT<br>OF DUE FEES<br>EFFECTIVE DATE : 20100131                                                                                        |
| EP1976734 A1 | 20101022 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                      | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST<br>EFFECTIVE DATE : 20100930                                                                                                                           |
| EP1976734 A1 | 20110531 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : FR<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT<br>OF DUE FEES<br>EFFECTIVE DATE : 20100201                                                                                        |
| EP1976734 A1 | 20110531 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : IE<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT<br>OF DUE FEES<br>EFFECTIVE DATE : 20100111                                                                                        |
| EP1976734 A1 | 20110531 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : GR<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20091203 |
| EP1976734 A1 | 20110630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : IT<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1 | 20110831 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                      | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                                        |
| EP1976734 A1 | 20110928 | LSLE | -GBPC | GB: EUROPEAN<br>PATENT CEASED<br>THROUGH NON-<br>PAYMENT OF<br>RENEWAL FEE                           | EFFECTIVE DATE : 20110111                                                                                                                                                                                 |
| EP1976734 A1 | 20111031 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : LI<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT<br>OF DUE FEES<br>EFFECTIVE DATE : 20110131                                                                                        |
| EP1976734 A1 | 20111031 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : CH<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT<br>OF DUE FEES<br>EFFECTIVE DATE : 20110131                                                                                        |
| EP1976734 A1 | 20111130 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT<br>OF DUE FEES<br>EFFECTIVE DATE : 20110111                                                                                        |
| EP1976734 A1 | 20111229 | LSDW | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                      | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE :<br>R119<br>REF DOCUMENT NUMBER :<br>602007002274<br>COUNTRY OF REF<br>DOCUMENT : DE<br>EFFECTIVE DATE : 20110802                                          |
| EP1976734 A1 | 20120928 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : LU<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT<br>OF DUE FEES<br>EFFECTIVE DATE : 20100111                                                                                        |
| EP1976734 A1 | 20120928 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | REF COUNTRY CODE : HU<br>DESCRIPTION : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20100303 |

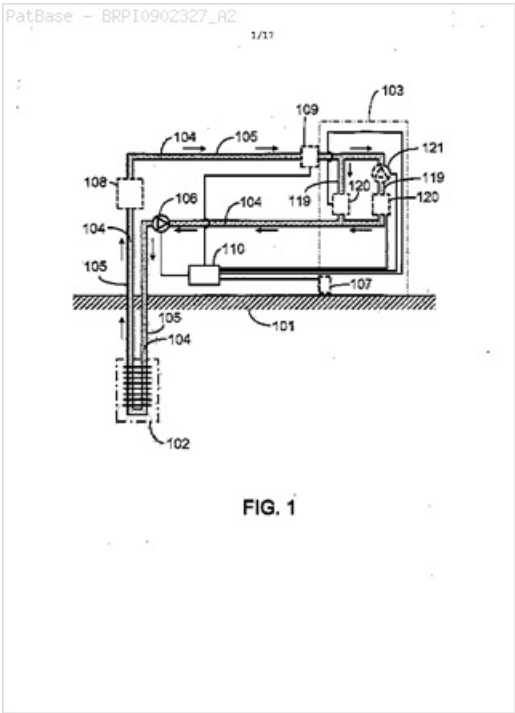
|                 |          |      |       |                                                                                                  |                                                                                                                                                                                            |
|-----------------|----------|------|-------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1976734 A1    | 20120928 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO            | REF COUNTRY CODE : BG<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1    | 20121031 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO            | REF COUNTRY CODE : TR<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20090902 |
| EP1976734 A1    | 20130628 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO            | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20110802                                                                               |
| EP1976734 B1    | 20090902 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                             |                                                                                                                                                                                            |
| EP1976734 B1    | 20270111 | PEXP |       | Calculated Patent Term Expiry                                                                    |                                                                                                                                                                                            |
| GB2435939 A1    | 20070912 | LSPB | +     | published / reissued                                                                             |                                                                                                                                                                                            |
| GB2435939 A1    | 20101006 | LSWD | -WAP  | APPLICATION WITHDRAWN, TAKEN TO BE WITHDRAWN OR REFUSED ** AFTER PUBLICATION UNDER SECTION 16(1) |                                                                                                                                                                                            |
| IN05792DN2008 A | 20081024 | LSPB | +     | published / reissued                                                                             |                                                                                                                                                                                            |
| US2010222955 AA | 20100902 | LSPB | +     | published / reissued                                                                             |                                                                                                                                                                                            |
| US2010222955 AA | 20111102 | LSWD | -ABD3 | Abandoned -- Failure to Respond to an Office Action                                              |                                                                                                                                                                                            |
| WO07083085 A1   | 20070726 | LSPB | +     | published / reissued                                                                             |                                                                                                                                                                                            |
| WO07083085 A1   | 20080618 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                                                      | REF DOCUMENT NUMBER : 2007700363<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                           |
| WO07083085 A1   | 20080703 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                                                      | REF DOCUMENT NUMBER : 12160077<br>COUNTRY OF REF DOCUMENT : US                                                                                                                             |
| WO07083085 A1   | 20080722 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                                                      | REF DOCUMENT NUMBER : 200780002854.1<br>COUNTRY OF REF DOCUMENT : CN                                                                                                                       |
| WO07083085 A1   | 20080724 | LSNE | NENP  | NON-ENTRY INTO THE NATIONAL PHASE IN:                                                            | REF COUNTRY CODE : DE                                                                                                                                                                      |

**Title:** INSTALACAO DE APLICACAO DE SEMICONDUTOR ADAPTADO A UM SISTEMA DE COMPENSACAO DE TEMPERATURA  
INSTALLATION OF SEMICONDUCTOR APPLICATION OF ADAPTED FOR A SYSTEM OF COMPENSATION OF TEMPERATURE  
(Machine translation)

**Abstract:** Source: BRPI0902327A INSTALACAO DE APLICACAO DE SEMICONDUTOR ADAPTADO A UM SISTEMA DE COMPENSACAO DE TEMPERATURA O proposito primario da presente invencao e prover uma instalacao de circulacao de fluido adaptada a um sistema de compensacao de temperatura e tubo de transmissao de fluido disposto em um vetor termico que existe em estado solido ou liquido na natureza em que apresenta capacidade de carga de calor comparativamente maior e mais confiavel. O fluido passa pela instalacao de aplicacao de semicondutor de estado solido ou gasoso para regular a instalacao de aplicacao de semicondutor para compensacao de temperatura, e flui de volta a instalacao de compensacao de calor disposta no vetor termico natural de calor para a instalacao de compensacao de calor que prove boa conducao de calor no vetor termico natural para prover a operacao de funcao de regulacao de compensacao de temperatura no refluxo do fluido.

**Machine translation:** INSTALLATION OF APPLICATION OF SUITABLE SEMICONDUCTOR TO a SYSTEM OF COMPENSATION OF TEMPERATURE the primary intention of the present invention and to provide an installation with suitable fluid circulation to a system of compensation of temperature and pipe of fluid transmission made use in a thermal vector that exists in solid state or I eliminate in the nature where it presents load capacity of bigger and comparatively more trustworthy heat. The fluid one passes for the installation of application of semiconductor of solid or gaseous state to regulate the installation of application of semiconductor for compensation of temperature, and flows in return the installation of compensation of heat made use in the natural thermal vector of heat for the installation of compensation of heat that proves good conduction of heat in the natural thermal vector to provide the operation with function of regulation of compensation of temperature in reflux of the fluid.

**Classifications:**  
**International (IPC 8-9):** F24J3/00 F28D1/02 (Advanced/Invention)  
**CPC:** Y02B30/765 Y02E10/10 Y02B10/40  
**European:** Y02B30/76D Y02E10/10



Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| BRPI0902327 A2     | 20110301         | BR2009PI02327      | 20090619         |

**Priority:**  
BR2009PI02327 20090619

**Probable Assignee:** YANG TAI HER  
**Assignee(s): (std):** YANG TAI HER  
**Assignee(s):** TAI HER YANG  
**Inventor(s): (std):** YANG TAI HER  
**Inventor(s):** TAI HER YANG

Legal status (INPADOC)

[View legal status timeline](#)

| Patent         | Date recorded | Event group | Code | Event                                                                                                           | Details                      |
|----------------|---------------|-------------|------|-----------------------------------------------------------------------------------------------------------------|------------------------------|
| BRPI0902327 A2 | 20110301      | LSPB        | +    | published / reissued                                                                                            |                              |
| BRPI0902327 A2 | 20110301      | LSPB        | B03A | PUBLICATION OF AN APPLICATION: PUBLICATION OF A PATENT APPLICATION OR OF A CERTIFICATE OF ADDITION OF INVENTION |                              |
| BRPI0902327 A2 | 20151110      | LSFE        | B08E | APPLICATION FEES: REQUIREMENT FOR                                                                               | DESCRIPTION : COMPLEMENTAR A |

|                |          |      |      |                                      |                                                                                                           |
|----------------|----------|------|------|--------------------------------------|-----------------------------------------------------------------------------------------------------------|
|                |          |      |      | COMPLEMENTATION OF ANNUITY FEE       | RETRIBUICAO DA 6A ANUIDADE DE ACORDO COM A TABELA VIGENTE, REFERENTE A GUIA DE RECOLHIMENTO 221407316910. |
| BRPI0902327 A2 | 20160105 | LSFE | B08H | APPLICATION FEES: DECISION CANCELLED | DESCRIPTION : REFERENTE AO DESPACHO 8.5 NA RPI 2340 DE 10/11/2015                                         |

**Title:** SEMICONDUCTOR APPLICATION INSTALLATION ADAPTED WITH A TEMPERATURE EQUALIZATION SYSTEM

**Abstract:** Source: US2010314070A The primary purpose of the present invention is to provide an fluid circulating installation adapted with a temperature equalization system and fluid transmission duct disposed in a heat carrier existing in solid or liquid state in the nature where presents comparatively larger and more reliable heat carrying capacity. The fluid passes through the solid or gas state semiconductor application installation to regulate the semiconductor application installation for temperature equalization, and flows back to the heat equalization installation disposed in the natural heat carrier of heat for the heat equalization installation providing good heat conduction in the natural heat carrier to provide the operation of temperature equalization regulating function on the backflow of the fluid.

**Classifications:**

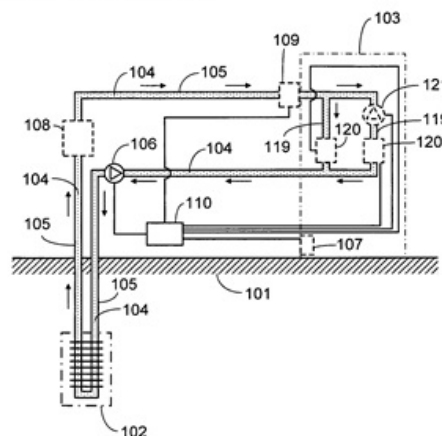
**International (IPC 8-9):** F21V29/00 F21V29/02 F21V29/56 F21V29/60 F24F5/00 F24J2/24 F24J3/06 F24J3/08 F25B27/00 F25B30/00 F28D15/02 G05D23/00 G05D23/19 G05D23/20 H01L21/02 H01L23/46 H01L31/024 H01L31/052 H02S20/10 H02S40/38 H02S40/42 H05K7/20 (Advanced/Invention); F21S9/03 F21W131/103 F21Y101/00 H01L23/473 (Advanced/Non-invention); H05K7/20 (Core/Non-invention)

**CPC:** F21V29/30 F21V29/56 F21V29/60 H01L31/024 F21V29/02 H01L31/0521 H01L21/02 F24F5/00 F24J3/06 F28D15/02 H05K7/20 F21S9/03 F21W2131/103 F21Y2101/00 F24J2/24 F24J3/083 F24J3/085 H01L23/473 H01L2924/0002 H02S20/10 H02S40/38 H02S40/425 H05K7/20927 H05K7/20945 Y02B10/40 Y02E10/125 Y02E10/14 Y02E10/44 Y02E10/50 F21Y2115/10 Y02B20/72 H01L2924/00 G05D23/19

**European:** F24J2/24 F24J3/08A2A F24J3/08B G05D23/19 H05K7/20W20 H05K7/20W90 R21S9/03 R21V29/30 R21W131/103 R21Y101/02 T01L23/473 Y02E10/12B Y02E10/14 Y02E10/44

**US:** 165/244 165/247 165/45 165/45P 165/97 236/1C 250/238 362/249.01 362/249.02 62/260

PatBase - US2010314070\_AA

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CA2669375 AA       | 20101217         | CA20092669375      | 20090617         |
| CN101932220 A      | 20101229         | CN200910148261     | 20090619         |
| CN101932220 B      | 20160120         | CN200910148261     | 20090619         |
| EP2264559 A2       | 20101222         | EP20090251928      | 20090804         |
| EP2264559 A3       | 20111221         | EP20090251928      | 20090804         |
| KR20100133877 A    | 20101222         | KR20090114482      | 20091125         |
| SG179298 A1        | 20120427         | SG20100065951      | 20100909         |
| TW201101979 A      | 20110101         | TW20090120356      | 20090618         |
| TWI489070 B        | 20150621         | TW20090120356      | 20090618         |
| US2010314070 AA    | 20101216         | US20090457505      | 20090612         |
| US2013214142 AA    | 20130822         | US20130850704      | 20130326         |
| US8448876 BB       | 20130528         | US20090457505      | 20090612         |
| US9625141 BB       | 20170418         | US20130850704      | 20130326         |

**Priority:**

CN200910148261 20090619 US20090457505 20090612 US20130850704 20130326

**Probable Assignee:** TAIHE YANG

**Assignee(s):** (std): TAIHE YANG ; YANG TAI HER

**Assignee(s):** YANG TAIHE

**Inventor(s):** (std): YANG TAI HER ; TAIHE YANG ; TAI HER YANG

**Inventor(s):** YANG TAIHE

**Agent(s):** PRATT DAVID MARTIN; WRIGHT HOWARD HUGH BURNBY; PYPRUS PTE LTD; BACON AND THOMAS PLLC

**Designated states:** AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent        | Date recorded | Event group | Code  | Event                                | Details                   |
|---------------|---------------|-------------|-------|--------------------------------------|---------------------------|
| CA2669375 AA  | 20101217      | LSPB        | +     | published / reissued                 |                           |
| CA2669375 AA  | 20140619      | LSSES       | +EEER | EXAMINATION REQUEST                  | EFFECTIVE DATE : 20140605 |
| CN101932220 A | 20101229      | LSPB        | +     | published / reissued                 |                           |
| CN101932220 A | 20101229      | LSPB        | +C06  | PUBLICATION                          |                           |
| CN101932220 A | 20160120      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL     |                           |
| CN101932220 B | 20160120      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                           |
| CN101932220 B | 20290619      | PEXP        |       | Calculated Patent Term Expiry        |                           |
| EP2264559 A2  | 20101222      | LSPB        | +     | published / reissued                 |                           |

|                 |          |      |       |                                              |                                             |
|-----------------|----------|------|-------|----------------------------------------------|---------------------------------------------|
| EP2264559 A2    | 20111221 | LSRE | RIC1  | CLASSIFICATION (CORRECTION)                  | IPC : G05D 23/19<br>20060101AFI20111118BHEP |
| EP2264559 A2    | 20111221 | LSRE | RIC1  | CLASSIFICATION (CORRECTION)                  | IPC : F24F 5/00<br>20060101ALI20111118BHEP  |
| EP2264559 A2    | 20111221 | LSRE | RIC1  | CLASSIFICATION (CORRECTION)                  | IPC : F24J 3/06<br>20060101ALI20111118BHEP  |
| EP2264559 A2    | 20111221 | LSRE | RIC1  | CLASSIFICATION (CORRECTION)                  | IPC : H05K 7/20<br>20060101ALI20111118BHEP  |
| EP2264559 A2    | 20111221 | LSRE | RIC1  | CLASSIFICATION (CORRECTION)                  | IPC : F24J 3/08<br>20060101ALI20111118BHEP  |
| EP2264559 A2    | 20120801 | LSES | +17P  | REQUEST FOR EXAMINATION FILED                | EFFECTIVE DATE : 20120621                   |
| EP2264559 A2    | 20121128 | LSES | +17Q  | FIRST EXAMINATION REPORT                     | EFFECTIVE DATE : 20121026                   |
| KR20100133877 A | 20101222 | LSPB | +     | published / reissued                         |                                             |
| KR20100133877 A | 20141023 | LSES | A201  | REQUEST FOR EXAMINATION                      |                                             |
| KR20100133877 A | 20151125 | LSES | -E902 | NOTIFICATION OF REASON FOR REFUSAL           |                                             |
| KR20100133877 A | 20160919 | LSRV | -E601 | DECISION TO REFUSE APPLICATION               |                                             |
| SG179298 A1     | 20120427 | LSPB | +     | published / reissued                         |                                             |
| TW201101979 A   | 20110101 | LSPB | +     | published / reissued                         |                                             |
| TWI489070 B     | 20150621 | LSGT | +     | granted / extensions (spc, cpc, pte)         |                                             |
| TWI489070 B     | 20290618 | PEXP |       | Calculated Patent Term Expiry                |                                             |
| US2010314070 AA | 20101216 | LSPB | +     | published / reissued                         |                                             |
| US2013214142 AA | 20130822 | LSPB | +     | published / reissued                         |                                             |
| US8448876 BB    | 20130528 | LSGT | +     | granted / extensions (spc, cpc, pte)         |                                             |
| US8448876 BB    | 20130508 | LSGT | PAT1  | Patented Case                                |                                             |
| US8448876 BB    | 20161108 | LSFE | +FPAY | FEE PAYMENT                                  | YEAR OF FEE PAYMENT : 4                     |
| US8448876 BB    | 20310712 | PEXP |       | Calculated Patent Term Expiry (PTA 760 days) |                                             |
| US9625141 BB    | 20170418 | LSGT | +     | granted / extensions (spc, cpc, pte)         |                                             |
| US9625141 BB    | 20170329 | LSGT | PAT1  | Patented Case                                |                                             |
| US9625141 BB    | 20330326 | PEXP |       | Calculated Patent Term Expiry                |                                             |

**Title:** Method and apparatus for injecting fuel using **control** fluid to **control** the injection's pressure and time

**Abstract:** Source: US5826561A An electronically-**controlled** heavy fuel oil injection system comprises a pumping chamber for pressurizing fuel and a direct-operated check for **controlling** fuel injection. A **control** fluid different from the fuel is used to operate regulating apparatus for **controlling** the fuel injection pressure and fuel injection timing. The regulating apparatus are isolated from the high viscosity, heavy fuel oil. Pressurization of fuel begins before the start of fuel injection. Fuel injection is initiated by exposing one end of the check to low pressure **control** fluid while the other end is exposed to high pressure fuel. Fuel injection is terminated by exposing the one check end to high pressure **control** fluid to hydraulically balance the check and allow a biasing device to close the check. The present invention provides improved **control** of several fuel injection parameters, including higher peak fuel injection capability and less fuel injection pressure drop at the end of injection, resulting in improved engine performance and reduced emissions, noise, and wear.

**Classifications:**

**International (IPC 8-9):** F02M47/04 F02M57/02 F02M59/10 F02M59/30 F02M59/36 F02M59/46 F02M61/18 (Advanced/Invention)

**International (IPC 1-7):** F02D19/08 F02M43/00 F02M47/00

F02M57/02 F02M59/32 F02M61/04 F02M7/00

**CPC:** F02M47/043 F02M57/02 F02M57/025 F02M59/105 F02M59/30

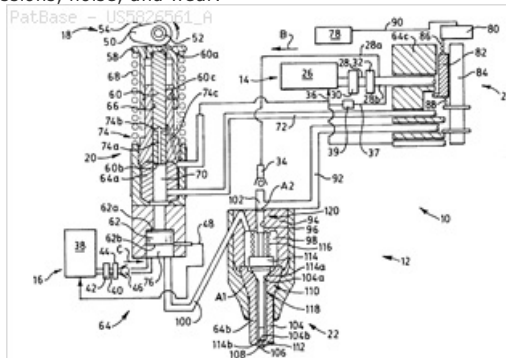
F02M59/365 F02M59/466 F02M59/468 F02M61/18 F02M2200/502

**European:** F02M47/04B F02M57/02 F02M57/02C2 F02M59/10C

F02M59/30 F02M59/36C F02M59/46E F02M59/46E2 F02M61/18

R02M200/50A

**US:** 123/381 123/446 123/467



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE19754917 A1      | 19980618         | DE19971054917      | 19971210         |
| GB2320285 A1       | 19980617         | GB19970021962      | 19971016         |
| GB2320285 B2       | 20000913         | GB19970021962      | 19971016         |
| GB9721962 A0       | 19971217         | GB19970021962      | 19971016         |
| US5826561 A        | 19981027         | US19960762504      | 19961210         |

**Priority:**

US19960762504 19961210

**Probable Assignee:** CATERPILLAR INC

**Assignee(s):** (std): CATERPILLAR INC

**Assignee(s):** CATERPILLAR INC PEORIA ILL US

**Inventor(s):** (std): MACK DAVID C ; MONCELLE MICHAEL E

**Inventor(s):** MONCELLE MICHAEL E BLOOMINGTON ILL US ; DAVID C MACK ; MACK DAVID C PONTIAC ILL US ; MICHAEL E MONCELLE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent        | Date recorded | Event group | Code  | Event                                | Details                                                                                                                                                                                           |
|---------------|---------------|-------------|-------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DE19754917 A1 | 19980618      | LSPB        | +     | published / reissued                 |                                                                                                                                                                                                   |
| DE19754917 A1 | 20050310      | LSLE        | -8141 | DISPOSAL/NO REQUEST FOR EXAMINATION  |                                                                                                                                                                                                   |
| GB2320285 A1  | 19980617      | LSPB        | +     | published / reissued                 |                                                                                                                                                                                                   |
| GB2320285 B2  | 20000913      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                   |
| GB2320285 B2  | 20171016      | PEXP        |       | Calculated Patent Term Expiry        |                                                                                                                                                                                                   |
| US5826561 A   | 19981027      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                   |
| US5826561 A   | 19961210      | LSAS        | AS    | ASSIGNMENT                           | OWNER NAME : CATERPILLAR INC., ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:MACK, DAVID C.; MONCELLE, MICHAEL E.; REEL/FRAME:008341/0390<br>EFFECTIVE DATE : 19961205 |
| US5826561 A   | 19980921      | LSGT        | PAT1  | Patented Case                        |                                                                                                                                                                                                   |
| US5826561 A   | 20020312      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                           |

|             |          |      |       |                                     |                          |
|-------------|----------|------|-------|-------------------------------------|--------------------------|
| US5826561 A | 20060328 | LSFE | +FPAY | FEE PAYMENT                         | YEAR OF FEE PAYMENT : 8  |
| US5826561 A | 20100323 | LSFE | +FPAY | FEE PAYMENT                         | YEAR OF FEE PAYMENT : 12 |
| US5826561 A | 20161210 | PEXP |       | Calculated<br>Patent Term<br>Expiry |                          |

**Title:** **Control** module for **controlling** hydraulically actuated intake/exhaust **valves** and a fuel injector

**Abstract:** Source: US5970956A A **control** module which **controls** camless hydraulically driven intake and exhaust **valves** and an hydraulically driven fuel injector of an internal combustion engine. The module contains a **valve** assembly to **control** the intake **valve**, a **valve** assembly to **control** the exhaust **valve** and a **valve** assembly to **control** the fuel injector. The **valve** assemblies preferably each contain a pair of solenoid actuated **two-way** spool **valves**. The solenoids are actuated by digital pulses provided by an **electronic** assembly within the module. The solenoid actuated spool **valves** **control** the flow of a hydraulic fluid to and from the fuel injector and the intake and exhaust **valves**. The hydraulic fluid opens and closes the intake and exhaust **valves**. The hydraulic fluid also actuates the fuel injector to eject a fuel into a combustion chamber of the engine. The **electronic** assembly of each module can be connected to a main microprocessor which provides commands to each assembly. Each **electronic** assembly processes the command, feedback signals from the hydraulically actuated devices and historical data to insure a desired operation of the fuel injector and intake and exhaust **valves**.

**Classifications:**

**International (IPC 8-9):** F01L9/02 F02M37/04 F02M37/12 F02M47/04 F02M57/02 F15B11/028 (Advanced/Invention);

F01L9/00 F02M37/04 F02M47/00 F02M57/00

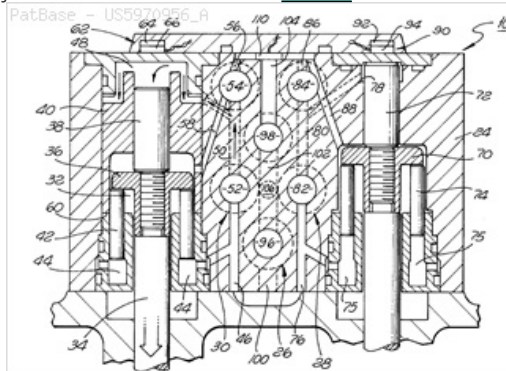
F15B11/00 (Core/Invention)

**International (IPC 1-7):** F01L9/02 F02M37/04 F02M37/12 F02M47/04 F15B11/028

**CPC:** F01L9/02 F02M57/025 F02M57/026

**European:** F01L9/02 F02M57/02C2 F02M57/02C2B

**US:** 123/508 123/90.12



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU199850990 A1     | 19980908         | AU19980050990      | 19971030         |
| CA2280525 AA       | 19990805         | CA19972280525      | 19971030         |
| CN1096558 C        | 20021218         | CN19971082110      | 19971030         |
| CN1256741 A        | 20000614         | CN19971082110      | 19971030         |
| EP0974004 A1       | 20000126         | EP19970913928      | 19971030         |
| EP0974004 A4       | 20010926         | EP19970913928      | 19971030         |
| JP2001527614 T2    | 20011225         | JP19980535707T     | 19971030         |
| US5970956 A        | 19991026         | US19970799296      | 19970213         |
| US6360728 BA       | 20020326         | US19990369497      | 19990805         |
| WO9836167 A1       | 19980820         | WO1997US19822      | 19971030         |

**Priority:**

US19970799296 19970213      US19990369497 19990805      WO1997US19822 19971030

**Probable Assignee:** STURMAN IND INC

**Assignee(s):** (std): ODED E STURMAN ; STURMAN IND INC ; STURMAN ODED E

**Assignee(s):** STURMAN INDUSTRIES ; STURMAN INDUSTRIES INC ; STURMAN IND

**Inventor(s):** (std): STURMAN ODED E ; ODED E STURMAN

**Agent(s):** RICHES MCKENZIE AND HERBERT LLP

**Designated states:** AL AM AT AU AZ BA BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CU CZ DE DK EE ES FI FR GA GB GE GH GN GR HU ID IE IL IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT UA UG US UZ VN YU ZW

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                                      | Details |
|--------------|---------------|-------------|-------|------------------------------------------------------------|---------|
| CA2280525 AA | 19990805      | LSPB        | +     | published / reissued                                       |         |
| CA2280525 AA | 19990805      | LSNP        | +AFNE | NATIONAL PHASE ENTRY                                       |         |
| CA2280525 AA | 20020930      | LSSE        | +EEER | EXAMINATION REQUEST                                        |         |
| CA2280525 AA | 20051031      | LSLE        | -FZDE | DEAD                                                       |         |
| CN1096558 C  | 20021218      | LSGT        | +     | granted / extensions (spc, cpc, pte)                       |         |
| CN1096558 C  | 20000614      | LSPB        | +C06  | PUBLICATION                                                |         |
| CN1096558 C  | 20021218      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL                           |         |
| CN1096558 C  | 20051228      | LSLE        | -C19  | LAPSE OF PATENT RIGHT DUE TO NON-PAYMENT OF THE ANNUAL FEE |         |
| CN1096558 C  | 20171030      | PEXP        |       | Calculated Patent                                          |         |

| Term Expiry     |          |      |       |                                             |                                                                                                                                                                                         |  |
|-----------------|----------|------|-------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| CN1256741 A     | 20000614 | LSPB | +     | published / reissued                        |                                                                                                                                                                                         |  |
| EP0974004 A1    | 20000126 | LSPB | +     | published / reissued                        |                                                                                                                                                                                         |  |
| EP0974004 A1    | 20000126 | LSES | +17P  | REQUEST FOR EXAMINATION FILED               | EFFECTIVE DATE : 19990907                                                                                                                                                               |  |
| EP0974004 A1    | 20010926 | LSES | +A4   | DESPATCH OF SUPPLEMENTARY SEARCH REPORT     | EFFECTIVE DATE : 20010814                                                                                                                                                               |  |
| EP0974004 A1    | 20010926 | LSRE | RIC1  | CLASSIFICATION (CORRECTION)                 | DESCRIPTION : 7F 02M 37/04 A, 7F 01L 9/02 B                                                                                                                                             |  |
| EP0974004 A1    | 20040519 | LSES | +17Q  | FIRST EXAMINATION REPORT                    | EFFECTIVE DATE : 20040405                                                                                                                                                               |  |
| EP0974004 A1    | 20050223 | LSDW | -18D  | DEEMED TO BE WITHDRAWN                      | EFFECTIVE DATE : 20040817                                                                                                                                                               |  |
| EP0974004 A1    | 20070608 | LSWD | REG   | REFERENCE TO A NATIONAL CODE                | REF COUNTRY CODE : HK<br>REF LEGAL EVENT CODE : WD<br>REF DOCUMENT NUMBER : 1025805<br>COUNTRY OF REF DOCUMENT : HK                                                                     |  |
| JP2001527614 T2 | 20011225 | LSPB | +     | published / reissued                        |                                                                                                                                                                                         |  |
| US5970956 A     | 19991026 | LSGT | +     | granted / extensions (spc, cpc, pte)        |                                                                                                                                                                                         |  |
| US5970956 A     | 20000419 | LSGT | PAT1  | Patented Case                               |                                                                                                                                                                                         |  |
| US5970956 A     | 20030425 | LSFE | +FPAY | FEE PAYMENT                                 | YEAR OF FEE PAYMENT : 4                                                                                                                                                                 |  |
| US5970956 A     | 20070426 | LSFE | +FPAY | FEE PAYMENT                                 | YEAR OF FEE PAYMENT : 8                                                                                                                                                                 |  |
| US5970956 A     | 20110425 | LSFE | +FPAY | FEE PAYMENT                                 | YEAR OF FEE PAYMENT : 12                                                                                                                                                                |  |
| US5970956 A     | 20170213 | PEXP |       | Calculated Patent Term Expiry               |                                                                                                                                                                                         |  |
| US6360728 BA    | 20020326 | LSGT | +     | granted / extensions (spc, cpc, pte)        |                                                                                                                                                                                         |  |
| US6360728 BA    | 20010504 | LSAS | AS    | ASSIGNMENT                                  | OWNER NAME : STURMAN INDUSTRIES, INC., COLORADO<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:STURMAN, ODED E.;<br>REEL/FRAME:011773/0195<br>EFFECTIVE DATE : 20010226 |  |
| US6360728 BA    | 20020308 | LSGT | PAT1  | Patented Case                               |                                                                                                                                                                                         |  |
| US6360728 BA    | 20040615 | LSRE | CC    | CERTIFICATE OF CORRECTION                   |                                                                                                                                                                                         |  |
| US6360728 BA    | 20050926 | LSFE | +FPAY | FEE PAYMENT                                 | YEAR OF FEE PAYMENT : 4                                                                                                                                                                 |  |
| US6360728 BA    | 20090928 | LSFE | +FPAY | FEE PAYMENT                                 | YEAR OF FEE PAYMENT : 8                                                                                                                                                                 |  |
| US6360728 BA    | 20130925 | LSFE | +FPAY | FEE PAYMENT                                 | YEAR OF FEE PAYMENT : 12                                                                                                                                                                |  |
| US6360728 BA    | 20190805 | PEXP |       | Calculated Patent Term Expiry               |                                                                                                                                                                                         |  |
| WO9836167 A1    | 19980820 | LSPB | +     | published / reissued                        |                                                                                                                                                                                         |  |
| WO9836167 A1    | 19990730 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE | REF DOCUMENT NUMBER : 1997913928<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                        |  |
| WO9836167 A1    | 19990805 | LSNP | ENP   | ENTRY INTO THE NATIONAL PHASE IN:           | REF COUNTRY CODE : CA<br>REF DOCUMENT NUMBER : 2280525<br>KIND CODE OF REF DOCUMENT : A<br>FORMAT OF REF DOCUMENT (F/P) : F                                                             |  |
| WO9836167 A1    | 19990805 | LSNP | ENP   | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : 2280525<br>COUNTRY OF REF DOCUMENT : CA                                                                                                                           |  |

|              |          |      |      |                                                |                                                                                                                                 |
|--------------|----------|------|------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| WO9836167 A1 | 19990809 | LSNP | ENP  | ENTRY INTO THE NATIONAL PHASE IN:              | REF COUNTRY CODE : JP<br>REF DOCUMENT NUMBER : 1998 535707<br>KIND CODE OF REF DOCUMENT : A<br>FORMAT OF REF DOCUMENT (F/P) : F |
| WO9836167 A1 | 19991216 | LSWD | REG  | REFERENCE TO NATIONAL CODE                     | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : 8642                                                                            |
| WO9836167 A1 | 20000126 | LSPB | +WWP | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE | REF DOCUMENT NUMBER : 1997913928<br>COUNTRY OF REF DOCUMENT : EP                                                                |
| WO9836167 A1 | 20040817 | LSWD | -WWW | WIPO INFORMATION: WITHDRAWN IN NATIONAL OFFICE | REF DOCUMENT NUMBER : 1997913928<br>COUNTRY OF REF DOCUMENT : EP                                                                |

**Title:** FUEL TANK COMPRISING AN AERATION SYSTEM

**Abstract:** Source: US2006144372A A fuel tank with ventilation system and activated carbon filter which, on the one hand, is connected by a first line (22) to the fuel tank and by a second line (25) to an internal combustion engine, and, on the other hand, by a third line (26) to the atmosphere, should have as simple and compact a ventilation system as possible, which fulfills all functions in full measure. To this end, a **controlled two-way valve** unit (23) is provided, whereof the first path connects the first line (22) to the third line (26) and the second path connects the second line (25) to the third line (26), and an **electronic control** unit (28) is provided, which on the input side is connected to a refueling sensor (7) and to a liquid level sensor (13) and on the output side is connected to the **controlled two-way valve** unit (23). The **controlled two-way valve** unit (23) comprises two **valves** (45, 46) accommodated in a common **housing** (40) and having closing bodies (47, 48), whereof the first (47) closes off or opens up the first path and the second (48) closes off or **controllably** opens up the second path.

**Classifications:**

**International (IPC 8-9):** B60K15/035 B60K15/077 F02D45/00 F02M25/08 F02M33/02 F02M33/04 F02M37/00

G05D9/00 (Advanced/Invention);

F02M33/02 (Advanced/Non-invention);

B60K15/03 B60K15/077 F02D45/00 F02M25/08 F02M33/00

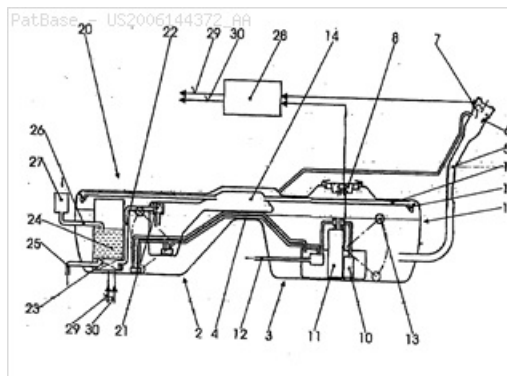
F02M37/00 G05D9/00 (Core/Invention)

**International (IPC 1-7):** B60K15/035

**CPC:** B60K15/03519

**European:** B60K15/035C

**US:** 123/516 123/519

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT6943 U1          | 20040625         | AT20030000246U     | 20030408         |
| CA2522012 AA       | 20051011         | CA20042522012      | 20040407         |
| CA2522012 C        | 20110607         | CA20042522012      | 20040407         |
| DE112004000589 D2  | 20060309         | DE200411000589     | 20040407         |
| JP2007524024 T2    | 20070823         | JP20060503949T     | 20040407         |
| JP4453086 B2       | 20100421         | JP20060503949T     | 20040407         |
| US2006144372 AA    | 20060706         | US20050552862      | 20051202         |
| US7204238 BB       | 20070417         | US20050552862      | 20051202         |
| WO04089673 A2      | 20041021         | WO2004AT00120      | 20040407         |
| WO04089673 A3      | 20050210         | WO2004AT00120      | 20040407         |

**Priority:**

AT20030000246U 20030408 WO2004AT00120 20040407

**Probable Assignee:** TESMA MOTOREN U GETRIEBE TECHNIK GMBH

**Assignee(s):** (std): PALVOELGYI SANDOR ; PALVOELGYI SANDOR ; POZGAINER GUENTHER ; POZGAINER GUNTHER ; TESMA MOTOREN U GETRIEBETEC ; TESMA MOTOREN U GETRIEBETECH ; TESMA MOTOREN GETRIEBE TECHNIK ; TESMA MOTGOREN UND GETRIEBETEC ; TESMA MOTOREN UND GETRIEBETECH

**Assignee(s):** TESMA MOTOREN UND GETRIEBE TECHNIK GMBH SINABELKIRC ; TESMA MOTOREN UND GETRIEBE TECHNIK GMBH SINABELKIRCHEN ; TESMA MOTOREN UND GETRIEBE TECHNIK GMBH ; TESMA MOTGOREN UND GETRIEBE TECHNIK GMBH ; TESMA MOTGOREN U GETRIEBE TECHNIK GMBH ; TESMA MOTOREN U GETRIEBE TECHNIK GMBH

**Inventor(s):** (std): PALVOELGYI SANDOR ; POZGAINER GUENTHER ; POZGAINER GUNTHER ; PALVOLGYI SANDOR ; POZGAINER GUENTHER DR ; PALVOELGYI SANDOR DIPL ING

**Inventor(s):** PALVOELGYI SANDOR DIPLING

**Agent(s):** BRANDT KERSTIN B; BACHMAN AND LAPOINTE PC

**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NA NE NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                | Details                   |
|--------------|---------------|-------------|-------|--------------------------------------|---------------------------|
| AT6943 U1    | 20040625      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                           |
| AT6943 U1    | 20130615      | LSLE        | -MK07 | EXPIRY                               | EFFECTIVE DATE : 20130430 |
| AT6943 U1    | 20130408      | PEXP        |       | Calculated Patent Term Expiry        |                           |
| CA2522012 AA | 20051011      | LSPB        | +     | published / reissued                 |                           |
| CA2522012 AA | 20051011      | LSNP        | +AFNE | NATIONAL PHASE ENTRY                 |                           |
| CA2522012 AA | 20090305      | LSES        | +EEER | EXAMINATION REQUEST                  |                           |

|                   |          |      |       |                                                                                           |                                                                               |
|-------------------|----------|------|-------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| CA2522012 C       | 20110607 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                                   |                                                                               |
| CA2522012 C       | 20240407 | PEXP |       | Calculated Patent Term<br>Expiry                                                          |                                                                               |
| DE112004000589 D2 | 20110317 | LSES | +8110 | REQUEST FOR<br>EXAMINATION<br>PARAGRAPH 44                                                |                                                                               |
| DE112004000589 D2 | 20110331 | LSAS | 8127  | NEW<br>PERSON/NAME/ADDRESS<br>OF THE APPLICANT                                            | OWNER NAME : MAGNA<br>STEYR FUEL SYSTEMS<br>GESMBH, SINABELKIRCHE,<br>AT      |
| DE112004000589 D2 | 20150822 | LSES | R016  | RESPONSE TO<br>EXAMINATION<br>COMMUNICATION                                               |                                                                               |
| JP2007524024 T2   | 20070823 | LSPB | +     | published / reissued                                                                      |                                                                               |
| JP4453086 B2      | 20100421 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                                   |                                                                               |
| JP4453086 B2      | 20090728 | LSES | -A131 | NOTIFICATION OF<br>REASONS FOR REFUSAL                                                    | TEXT : JAPANESE<br>INTERMEDIATE CODE:<br>A131<br>EFFECTIVE DATE :<br>20090728 |
| JP4453086 B2      | 20091112 | LSRE | A521  | WRITTEN AMENDMENT                                                                         | TEXT : JAPANESE<br>INTERMEDIATE CODE:<br>A523<br>EFFECTIVE DATE :<br>20091022 |
| JP4453086 B2      | 20091214 | LSGT | +TRDD | DECISION OF GRANT<br>OR REJECTION<br>WRITTEN                                              |                                                                               |
| JP4453086 B2      | 20091222 | LSGT | +A01  | WRITTEN DECISION TO<br>GRANT A PATENT OR TO<br>GRANT A<br>REGISTRATION<br>(UTILITY MODEL) | TEXT : JAPANESE<br>INTERMEDIATE CODE: A01<br>EFFECTIVE DATE :<br>20091222     |
| JP4453086 B2      | 20091224 | LSGT | +A01  | WRITTEN DECISION TO<br>GRANT A PATENT OR TO<br>GRANT A<br>REGISTRATION<br>(UTILITY MODEL) | TEXT : JAPANESE<br>INTERMEDIATE CODE: A01                                     |
| JP4453086 B2      | 20100212 | LSFE | +A61  | FIRST PAYMENT OF<br>ANNUAL FEES (DURING<br>GRANT PROCEDURE)                               | TEXT : JAPANESE<br>INTERMEDIATE CODE: A61<br>EFFECTIVE DATE :<br>20100121     |
| JP4453086 B2      | 20100212 | LSFE | +FPAY | RENEWAL FEE PAYMENT<br>(EVENT DATE IS<br>RENEWAL DATE OF<br>DATABASE)                     | YEAR OF FEE PAYMENT : 3                                                       |
| JP4453086 B2      | 20100212 | LSGT | +R150 | CERTIFICATE OF<br>PATENT OR<br>REGISTRATION OF<br>UTILITY MODEL                           | TEXT : JAPANESE<br>INTERMEDIATE CODE:<br>R150                                 |
| JP4453086 B2      | 20130212 | LSFE | +FPAY | RENEWAL FEE PAYMENT<br>(EVENT DATE IS<br>RENEWAL DATE OF<br>DATABASE)                     | YEAR OF FEE PAYMENT : 4                                                       |
| JP4453086 B2      | 20140212 | LSFE | +R250 | RECEIPT OF ANNUAL<br>FEES                                                                 | TEXT : JAPANESE<br>INTERMEDIATE CODE:<br>R250                                 |
| JP4453086 B2      | 20150210 | LSFE | +R250 | RECEIPT OF ANNUAL<br>FEES                                                                 | TEXT : JAPANESE<br>INTERMEDIATE CODE:<br>R250                                 |
| JP4453086 B2      | 20160209 | LSFE | +R250 | RECEIPT OF ANNUAL<br>FEES                                                                 | TEXT : JAPANESE<br>INTERMEDIATE CODE:<br>R250                                 |
| JP4453086 B2      | 20170207 | LSFE | +R250 | RECEIPT OF ANNUAL<br>FEES                                                                 | TEXT : JAPANESE<br>INTERMEDIATE CODE:<br>R250                                 |
| JP4453086 B2      | 20240407 | PEXP |       | Calculated Patent Term<br>Expiry                                                          |                                                                               |
| US2006144372 AA   | 20060706 | LSPB | +     | published / reissued                                                                      |                                                                               |
| US7204238 BB      | 20070417 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                                   |                                                                               |
| US7204238 BB      | 20051202 | LSAS | AS    | ASSIGNMENT                                                                                | OWNER NAME : TESMA<br>MOTOREN-UND<br>GETRIEBE TECHNIK GMBH,<br>AUSTRIA        |

|               |          |      |                                  |                                                      |                                                                                                                                                                           |
|---------------|----------|------|----------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |          |      |                                  |                                                      | DESCRIPTION :<br>ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:POZGAINER,<br>GUNTHER; PALVOLGYI,<br>SANDOR;<br>REEL/FRAME:017291/0174<br>EFFECTIVE DATE :<br>20051006 |
| US7204238 BB  | 20070328 | LSGT | PAT1                             | Patented Case                                        |                                                                                                                                                                           |
| US7204238 BB  | 20101008 | LSFE | +FPAY                            | FEE PAYMENT                                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                   |
| US7204238 BB  | 20141009 | LSFE | +FPAY                            | FEE PAYMENT                                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                   |
| US7204238 BB  | 20251202 | PEXP | Calculated Patent Term<br>Expiry |                                                      |                                                                                                                                                                           |
| WO04089673 A2 | 20041021 | LSPB | +                                | published / reissued                                 |                                                                                                                                                                           |
| WO04089673 A3 | 20051005 | LSNP | +WWE                             | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE    | REF DOCUMENT NUMBER :<br>2006503949<br>COUNTRY OF REF<br>DOCUMENT : JP                                                                                                    |
| WO04089673 A3 | 20051010 | LSNP | +WWE                             | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE    | REF DOCUMENT NUMBER :<br>91052004<br>COUNTRY OF REF<br>DOCUMENT : AT                                                                                                      |
| WO04089673 A3 | 20051011 | LSNP | +WWE                             | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE    | REF DOCUMENT NUMBER :<br>2522012<br>COUNTRY OF REF<br>DOCUMENT : CA                                                                                                       |
| WO04089673 A3 | 20051202 | LSNP | ENP                              | ENTRY INTO THE<br>NATIONAL PHASE IN:                 | REF DOCUMENT NUMBER :<br>2006144372<br>COUNTRY OF REF<br>DOCUMENT : US<br>KIND CODE OF REF<br>DOCUMENT : A1                                                               |
| WO04089673 A3 | 20051202 | LSNP | +WWE                             | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE    | REF DOCUMENT NUMBER :<br>10552862<br>COUNTRY OF REF<br>DOCUMENT : US                                                                                                      |
| WO04089673 A3 | 20060309 | LSNP | +WWE                             | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE    | REF DOCUMENT NUMBER :<br>112004000589<br>COUNTRY OF REF<br>DOCUMENT : DE                                                                                                  |
| WO04089673 A3 | 20060706 | LSPB | +WWP                             | WIPO INFORMATION:<br>PUBLISHED IN<br>NATIONAL OFFICE | REF DOCUMENT NUMBER :<br>10552862<br>COUNTRY OF REF<br>DOCUMENT : US                                                                                                      |

**Title:** Piston and barrel assembly with stepped top and hydraulically-actuated fuel injector utilizing same

**Abstract:** Source: US2002148444A A hydraulically actuated fuel injector has an injector body including a barrel and defining a nozzle chamber, a needle **control** chamber, and a nozzle outlet that opens to the nozzle chamber. The injector body further includes an actuation fluid inlet and an actuation fluid drain. A barrel defines an actuation fluid cavity and a piston bore, which includes an upper bore and a lower bore. Fuel is hydraulically pressurized in the nozzle chamber. A piston with a stepped top slides in the piston bore and moves in between a retracted position and an advanced position. A needle **valve** member in the nozzle chamber moves between an open position and a closed position. The needle **valve** member includes a closing hydraulic surface exposed to pressure in the needle **control** chamber. A needle **control valve** including an actuator is attached to the injector body and moves between an off position in which the needle **control** chamber is opened to a source of high pressure fluid and an on position in which the needle **control** chamber is opened to a low pressure passage. An actuation fluid **control valve** opens and closes the actuation fluid cavity.

**Classifications:**

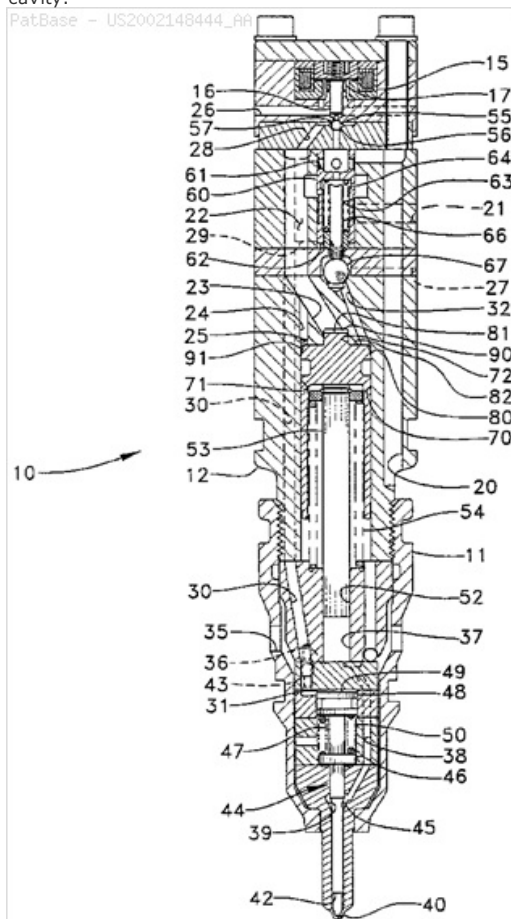
**International (IPC 8-9):** F02G5/00 F02M45/04 F02M45/08 F02M47/00 F02M47/02 F02M47/04 F02M51/06 F02M57/02 F02M59/10 F02M59/36 F02M59/46 F02M61/16 F02M61/20 F02M63/00 F02M63/02 G03F1/00 G03F1/08 G03F1/32 G03F1/68 H01L21/027 (Advanced/Invention); F02M63/00 G03F1/00 (Advanced/Non-invention); F02G5/00 F02M45/00 F02M47/00 F02M47/02 F02M51/06 F02M57/00 F02M59/00 F02M59/20 (Core/Invention); F02M63/00 (Core/Non-invention)

**International (IPC 1-7):** F02D41/26 F02M1/00 F02M37/04 F02M41/00 F02M45/08 F02M47/00 F02M47/02 F02M47/04 F02M51/00 F02M51/06 F02M57/00 F02M57/02 F02M59/10 F02M59/46 F02M61/10 F02M61/16 F02M61/20 F02M63/00 F02M69/16 F02M7/00 F15B15/22 F16K31/40

**CPC:** F02M47/04 Y02T10/123 F02M57/026 F02M59/468 F02M47/043 F02M2200/21 F02M45/08 F02M63/0026 F02M63/0029 F02M63/0036 F02M63/004 F02M63/0042 F02M63/0045 F02M2200/502 F02M63/0049 F02B2275/14 F02G5/00 F02M45/04 F02M47/027 F02M57/025 F02M59/105 F02M59/366 F02M59/466 F02M63/0017 F02M63/0061 Y02T10/166

**European:** F02G5/00 F02M45/04 F02M45/08 F02M47/02D F02M47/04 F02M47/04B F02M57/02C2 F02M57/02C2B F02M59/10C F02M59/36D F02M59/46E F02M63/00E10B F02M63/00E2B1 F02M63/00E2B4 F02M63/00E2F2 F02M63/00E4A4 F02M63/00E4C F02M63/00E4C2 F02M63/00E4F F02M63/00E4H F02M63/02C G03F1/32 S03F1/08

**US:** 123/446 123/467 123/496 123/506 239/88 239/96 251/30.05 91/24



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU200014518 A1     | 20000529         | AU20000014518      | 19991027         |
| AU200014518 A5     | 20000529         | AU20000014518      | 19991027         |
| DE19581047 B4      | 20090409         | DE19951081047      | 19950713         |
| DE19581047 T       | 20020627         | DE19951081047T     | 19950713         |
| DE19581047 T1      | 20020627         | DE19951081047T     | 19950713         |
| DE19726604 A1      | 19980102         | DE19971026604      | 19970623         |
| DE19726604 B4      | 20080430         | DE19971026604      | 19970623         |
| DE19982500 T       | 20010222         | DE19991082500T     | 19991027         |
| DE19982500 T1      | 20010222         | DE19991082500T     | 19991027         |
| DE69720123 D1      | 20030430         | DE19976020123      | 19970812         |
| DE69720123 T2      | 20040129         | DE19976020123T     | 19970812         |
| DE69727713 D1      | 20040325         | DE19976027713      | 19970812         |
| DE69727713 T2      | 20041125         | DE19976027713T     | 19970812         |
| DE69729333 D1      | 20040701         | DE19976029333      | 19970812         |
| DE69729333 T2      | 20040923         | DE19976029333T     | 19970812         |
| DE69738153 D1      | 20071031         | DE19976038153      | 19970630         |
| DE69738153 T2      | 20080612         | DE19976038153T     | 19970630         |
| EP0826877 A2       | 19980304         | EP19970306118      | 19970812         |
| EP0826877 A3       | 19980506         | EP19970306118      | 19970812         |
| EP0826877 B1       | 20030326         | EP19970306118      | 19970812         |
| EP0829640 A2       | 19980318         | EP19970304703      | 19970630         |
| EP0829640 A3       | 19981216         | EP19970304703      | 19970630         |
| EP0829640 B1       | 20070919         | EP19970304703      | 19970630         |
| EP1152144 A2       | 20011107         | EP20010117613      | 19970812         |
| EP1152144 A3       | 20021218         | EP20010117613      | 19970812         |
| EP1152144 B1       | 20040218         | EP20010117613      | 19970812         |
| EP1152145 A2       | 20011107         | EP20010117614      | 19970812         |
| EP1152145 A3       | 20021218         | EP20010117614      | 19970812         |

|                 |          |                |          |
|-----------------|----------|----------------|----------|
| EP1152145 B1    | 20040526 | EP20010117614  | 19970812 |
| FR2750173 A1    | 19971226 | FR19970008053  | 19970620 |
| GB2295649 A1    | 19960605 | GB19960002958  | 19950713 |
| GB2295649 B2    | 19981007 | GB19960002958  | 19950713 |
| GB2314379 A1    | 19971224 | GB19970008760  | 19970429 |
| GB2314379 B2    | 20000322 | GB19970008760  | 19970429 |
| GB2320523 A1    | 19980624 | GB19980005319  | 19950713 |
| GB2320523 B2    | 19981007 | GB19980005319  | 19950713 |
| GB9602958 A0    | 19960410 | GB19960002958  | 19950713 |
| GB9708760 A0    | 19970625 | GB19970008760  | 19970429 |
| GB9805319 A0    | 19980506 | GB19980005319  | 19950713 |
| JP09503272 T2   | 19970331 | JP19950506522T | 19950713 |
| JP10054322 A2   | 19980224 | JP19970156227  | 19970613 |
| JP10103185 A2   | 19980421 | JP19970233013  | 19970828 |
| JP10110658 A2   | 19980428 | JP19970235803  | 19970901 |
| JP9503272 T2    | 19970331 | JP19970506522T | 19950713 |
| US2002148444 AA | 20021017 | US20020167140  | 20020611 |
| US5463996 A     | 19951107 | US19940283232  | 19940729 |
| US5669355 A     | 19970923 | US19960705393  | 19960830 |
| US5673669 A     | 19971007 | US19950489660  | 19950612 |
| US5687693 A     | 19971118 | US19960707804  | 19960830 |
| US5697342 A     | 19971216 | US19960668552  | 19960621 |
| US5738075 A     | 19980414 | US19970864606  | 19970528 |
| US5826562 A     | 19981027 | US19960768014  | 19961213 |
| US6065450 A     | 20000523 | US19980053959  | 19980402 |
| US6082332 A     | 20000704 | US19980186852  | 19981105 |
| US6425375 BA    | 20020730 | US20000562126  | 20000501 |
| US6575137 BB    | 20030610 | US20020167140  | 20020611 |
| WO0028208 A1    | 20000518 | WO1999US25026  | 19991027 |
| WO0034646 A1    | 20000615 | WO1999US28406  | 19991130 |
| WO9603853 A2    | 19960215 | WO1995US08798  | 19950713 |
| WO9603853 A3    | 19960502 | WO1995US08798  | 19950713 |

Priority:

|               |          |               |          |               |          |
|---------------|----------|---------------|----------|---------------|----------|
| EP19970306118 | 19970812 | EP19970306118 | 19970812 | GB19960002958 | 19950713 |
| US19960768014 | 19961213 | US19960707804 | 19960830 | US19960668552 | 19960621 |
| US19950489660 | 19950612 | US19960705393 | 19960830 | US19940283232 | 19940729 |
| US19980209785 | 19981211 | US20020167140 | 20020611 | US20000562126 | 20000501 |
| US19980053959 | 19980402 | US19970864606 | 19970528 | US19980186852 | 19981105 |
| WO1999US25026 | 19991027 | WO1995US08798 | 19950713 | WO1995US08798 | 19950713 |

Probable Assignee: CATERPILLAR INC

Assignee(s): (std): CATERPILLAR INC ; SAMSUNG ELECTRONICS CO LTD

Assignee(s): HEFLER GREGORY W ; CATERPILLAR INC PEORIA ; CATERPILLAR INC PEORIA ILL US ; CHEN SHIKUI K

Inventor(s): (std): CHEN SHIKUI K ; HEFLER GREGORY W ; SOMMARS MARK F ; SHINOGLE RONALD D ; MALEY DALE C ; HEFLER GREGORY ; GIBSON DENNIS H ; CHEN SHIKUI ; ANDERSON MICHAEL D

Inventor(s): RONALD D SHINOGLE ; DALE C MALEY ; DENNIS H GIBSON ; GREGORY W HEFLER ; SHIKUI K CHEN ; MICHAEL D ANDERSON ; MARK F SOMMARS

Agent(s): SHISHIDO KAICHI; MURAKOSO HIROO; TAKEUCHI HIDEITO; OHTSUKA FUMIAKI; IMASHIRO TOSHIO; NAKAMURA MINORU; OGAWA NOBUO

Designated states: AT AU BE CH CY DE DK ES FI FR GB GR IE IT JP LI LU MC NL PT SE

Legal status (INPADOC)

[View legal status timeline](#)

| Patent         | Date recorded | Event group | Code  | Event                                                                                      | Details |
|----------------|---------------|-------------|-------|--------------------------------------------------------------------------------------------|---------|
| AU200014518 A1 | 20010802      | LSLE        | -MK6  | APPLICATION LAPSED SECTION 142(2)(F)/REG. 8.3(3) - PCT APPLIC. NOT ENTERING NATIONAL PHASE |         |
| DE19581047 B4  | 20090409      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                       |         |
| DE19581047 B4  | 20091001      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                                    |         |
| DE19581047 B4  | 20100520      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                                       |         |
| DE19581047 B4  | 20150713      | PEXP        |       | Calculated Patent Term Expiry                                                              |         |
| DE19581047 T   | 20020627      | LSPB        | +     | published / reissued                                                                       |         |
| DE19581047 T1  | 20020627      | LSPB        | +     | published / reissued                                                                       |         |
| DE19581047 T1  | 20020905      | LSES        | +8110 | REQUEST FOR                                                                                |         |

|               |          |       |       |                                                        |
|---------------|----------|-------|-------|--------------------------------------------------------|
| DE19726604 A1 | 19980102 | LSPB  | +     | EXAMINATION<br>PARAGRAPH 44<br>published /<br>reissued |
| DE19726604 A1 | 20040909 | LSSES | +8110 | REQUEST FOR<br>EXAMINATION<br>PARAGRAPH 44             |
| DE19726604 A1 | 20081023 | LSGT  | +8364 | NO OPPOSITION<br>DURING TERM<br>OF<br>OPPOSITION       |
| DE19726604 A1 | 20100422 | LSLE  | -8339 | CEASED/NON-<br>PAYMENT OF THE<br>ANNUAL FEE            |
| DE19726604 B4 | 20080430 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)             |
| DE19726604 B4 | 20170623 | PEXP  |       | Calculated<br>Patent Term<br>Expiry                    |
| DE19982500 T  | 20010222 | LSPB  | +     | published /<br>reissued                                |
| DE19982500 T1 | 20010222 | LSPB  | +     | published /<br>reissued                                |
| DE19982500 T1 | 20070104 | LSSES | +8110 | REQUEST FOR<br>EXAMINATION<br>PARAGRAPH 44             |
| DE19982500 T1 | 20100819 | LSLE  | -8139 | DISPOSAL/NON-<br>PAYMENT OF THE<br>ANNUAL FEE          |
| DE69720123 D1 | 20040422 | LSGT  | +8364 | NO OPPOSITION<br>DURING TERM<br>OF<br>OPPOSITION       |
| DE69720123 D1 | 20100624 | LSLE  | -8339 | CEASED/NON-<br>PAYMENT OF THE<br>ANNUAL FEE            |
| DE69720123 T2 | 20040129 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)             |
| DE69720123 T2 | 20170812 | PEXP  |       | Calculated<br>Patent Term<br>Expiry                    |
| DE69727713 D1 | 20050317 | LSGT  | +8364 | NO OPPOSITION<br>DURING TERM<br>OF<br>OPPOSITION       |
| DE69727713 D1 | 20100624 | LSLE  | -8339 | CEASED/NON-<br>PAYMENT OF THE<br>ANNUAL FEE            |
| DE69727713 T2 | 20041125 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)             |
| DE69727713 T2 | 20170812 | PEXP  |       | Calculated<br>Patent Term<br>Expiry                    |
| DE69729333 D1 | 20050623 | LSGT  | +8364 | NO OPPOSITION<br>DURING TERM<br>OF<br>OPPOSITION       |
| DE69729333 D1 | 20100624 | LSLE  | -8339 | CEASED/NON-<br>PAYMENT OF THE<br>ANNUAL FEE            |
| DE69729333 T2 | 20040923 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)             |
| DE69729333 T2 | 20170812 | PEXP  |       | Calculated<br>Patent Term<br>Expiry                    |
| DE69738153 D1 | 20081009 | LSGT  | +8364 | NO OPPOSITION<br>DURING TERM<br>OF<br>OPPOSITION       |
| DE69738153 D1 | 20100422 | LSLE  | -8339 | CEASED/NON-<br>PAYMENT OF THE<br>ANNUAL FEE            |
| DE69738153 T2 | 20080612 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)             |
| DE69738153 T2 | 20170630 | PEXP  |       | Calculated<br>Patent Term<br>Expiry                    |

|              |          |       |       |                                                                                                            |                                                                                                                                                                                                                    |
|--------------|----------|-------|-------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP0826877 A2 | 19980304 | LSPB  | +     | published /<br>reissued                                                                                    |                                                                                                                                                                                                                    |
| EP0826877 A2 | 19981230 | LSSES | +17P  | REQUEST FOR<br>EXAMINATION<br>FILED                                                                        | EFFECTIVE DATE : 19981104                                                                                                                                                                                          |
| EP0826877 A2 | 19990120 | LSFE  | +AKX  | PAYMENT OF<br>DESIGNATION<br>FEES                                                                          | TEXT : DE FR GB                                                                                                                                                                                                    |
| EP0826877 A2 | 20010328 | LSSES | +17Q  | FIRST<br>EXAMINATION<br>REPORT                                                                             | EFFECTIVE DATE : 20010208                                                                                                                                                                                          |
| EP0826877 A2 | 20030326 | LSLE  | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT : FR<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE DESCRIPTION<br>OR TO PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20030326 |
| EP0826877 A2 | 20030326 | LSGT  | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                            | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D                                                                                                                                                               |
| EP0826877 A2 | 20030804 | LSFE  | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20030804<br>YEAR OF FEE PAYMENT : 7                                                                                                                                 |
| EP0826877 A2 | 20040317 | LSGT  | +26N  | NO OPPOSITION<br>FILED                                                                                     | EFFECTIVE DATE : 20031230                                                                                                                                                                                          |
| EP0826877 A2 | 20081031 | LSFE  | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20080829<br>YEAR OF FEE PAYMENT : 12                                                                                                                                |
| EP0826877 A2 | 20081231 | LSFE  | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20080708<br>YEAR OF FEE PAYMENT : 12                                                                                                                                |
| EP0826877 A2 | 20100428 | LSLE  | -GBPC | GB: EUROPEAN<br>PATENT CEASED<br>THROUGH NON-<br>PAYMENT OF<br>RENEWAL FEE                                 | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20090812                                                                                                                                                                 |
| EP0826877 A2 | 20100730 | LSLE  | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT : DE<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE<br>FEES<br>LAPSED DATE : 20100302                                                                                     |
| EP0826877 A2 | 20101130 | LSLE  | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT : GB<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE<br>FEES<br>LAPSED DATE : 20090812                                                                                     |
| EP0826877 B1 | 20030326 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                                 |                                                                                                                                                                                                                    |
| EP0826877 B1 | 20170812 | PEXP  |       | Calculated<br>Patent Term<br>Expiry                                                                        |                                                                                                                                                                                                                    |
| EP0829640 A2 | 19980318 | LSPB  | +     | published /<br>reissued                                                                                    |                                                                                                                                                                                                                    |
| EP0829640 A2 | 19981209 | LSRE  | RHK1  | MAIN<br>CLASSIFICATION<br>(CORRECTION)                                                                     | IPC : F02M 57/02                                                                                                                                                                                                   |
| EP0829640 A2 | 19990804 | LSSES | +17P  | REQUEST FOR<br>EXAMINATION<br>FILED                                                                        | EFFECTIVE DATE : 19990607                                                                                                                                                                                          |
| EP0829640 A2 | 19990825 | LSFE  | +AKX  | PAYMENT OF<br>DESIGNATION<br>FEES                                                                          | DESCRIPTION : DE FR GB                                                                                                                                                                                             |
| EP0829640 A2 | 20011205 | LSSES | +17Q  | FIRST<br>EXAMINATION<br>REPORT                                                                             | EFFECTIVE DATE : 20011022                                                                                                                                                                                          |
| EP0829640 A2 | 20070919 | LSGT  | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                            | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D                                                                                                                                                               |
| EP0829640 A2 | 20080827 | LSGT  | +26N  | NO OPPOSITION<br>FILED                                                                                     | EFFECTIVE DATE : 20080620                                                                                                                                                                                          |
| EP0829640 A2 | 20080930 | LSLE  | -PG25 | LAPSED IN A                                                                                                | REF COUNTRY CODE : FR                                                                                                                                                                                              |

|              |          |      |       |                                                                                                            |                                                                                                                                                                               |
|--------------|----------|------|-------|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO                | DESCRIPTION : LAPSE BECAUSE OF<br>FAILURE TO SUBMIT A<br>TRANSLATION OF THE DESCRIPTION<br>OR TO PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20080523 |
| EP0829640 A2 | 20081031 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20080630<br>YEAR OF FEE PAYMENT : 12                                                                                                  |
| EP0829640 A2 | 20081231 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                                                 | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20080506<br>YEAR OF FEE PAYMENT : 12                                                                                                  |
| EP0829640 A2 | 20100224 | LSLE | -GBPC | GB: EUROPEAN<br>PATENT CEASED<br>THROUGH NON-<br>PAYMENT OF<br>RENEWAL FEE                                 | EFFECTIVE DATE : 20090630                                                                                                                                                     |
| EP0829640 A2 | 20100531 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE BECAUSE OF<br>NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20090630                                                               |
| EP0829640 A2 | 20100630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE BECAUSE OF<br>NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20100101                                                               |
| EP0829640 B1 | 20070919 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                                 |                                                                                                                                                                               |
| EP0829640 B1 | 20170630 | PEXP |       | Calculated<br>Patent Term<br>Expiry                                                                        |                                                                                                                                                                               |
| EP1152144 A2 | 20011107 | LSPB | +     | published /<br>reissued                                                                                    |                                                                                                                                                                               |
| EP1152144 A2 | 20021218 | LSRE | RIC1  | CLASSIFICATION<br>(CORRECTION)                                                                             | TEXT : 7F 02M 57/02 A, 7F 02M<br>47/02 B, 7F 02M 59/10 B, 7F 02M<br>59/46 B                                                                                                   |
| EP1152144 A2 | 20030806 | LSSE | +17P  | REQUEST FOR<br>EXAMINATION<br>FILED                                                                        | EFFECTIVE DATE : 20030606                                                                                                                                                     |
| EP1152144 A2 | 20030910 | LSFE | +AKX  | PAYMENT OF<br>DESIGNATION<br>FEES                                                                          | COUNTRY OF REF DOCUMENT : DE<br>COUNTRY OF REF DOCUMENT : FR<br>COUNTRY OF REF DOCUMENT : GB                                                                                  |
| EP1152144 A2 | 20040218 | LSGT | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                            | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D                                                                                                                          |
| EP1152144 A2 | 20050209 | LSGT | +26N  | NO OPPOSITION<br>FILED                                                                                     | EFFECTIVE DATE : 20041119                                                                                                                                                     |
| EP1152144 A2 | 20081031 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20080829<br>YEAR OF FEE PAYMENT : 12                                                                                           |
| EP1152144 A2 | 20081128 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20080807<br>YEAR OF FEE PAYMENT : 12                                                                                           |
| EP1152144 A2 | 20081231 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20080708<br>YEAR OF FEE PAYMENT : 12                                                                                           |
| EP1152144 A2 | 20100428 | LSLE | -GBPC | GB: EUROPEAN<br>PATENT CEASED<br>THROUGH NON-<br>PAYMENT OF<br>RENEWAL FEE                                 | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20090812                                                                                                                            |
| EP1152144 A2 | 20100521 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                            | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST<br>EFFECTIVE DATE : 20100430                                                                                               |
| EP1152144 A2 | 20100730 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA                                                       | COUNTRY OF REF DOCUMENT : DE<br>NOTIFICATION OF LAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE<br>FEES                                                                        |

|              |          |      |       |                                                                                                            |                                                                                                                                |
|--------------|----------|------|-------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO                                                         | LAPSED DATE : 20100302                                                                                                         |
| EP1152144 A2 | 20100730 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT : FR<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE<br>FEES<br>LAPSED DATE : 20090831 |
| EP1152144 A2 | 20101130 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT : GB<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE<br>FEES<br>LAPSED DATE : 20090812 |
| EP1152144 B1 | 20040218 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                                 |                                                                                                                                |
| EP1152144 B1 | 20170812 | PEXP |       | Calculated<br>Patent Term<br>Expiry                                                                        |                                                                                                                                |
| EP1152145 A2 | 20011107 | LSPB | +     | published /<br>reissued                                                                                    |                                                                                                                                |
| EP1152145 A2 | 20030806 | LSES | +17P  | REQUEST FOR<br>EXAMINATION<br>FILED                                                                        | EFFECTIVE DATE : 20030604                                                                                                      |
| EP1152145 A2 | 20030827 | LSES | +17Q  | FIRST<br>EXAMINATION<br>REPORT                                                                             | EFFECTIVE DATE : 20030708                                                                                                      |
| EP1152145 A2 | 20030910 | LSFE | +AKX  | PAYMENT OF<br>DESIGNATION<br>FEES                                                                          | COUNTRY OF REF DOCUMENT : DE<br>COUNTRY OF REF DOCUMENT : FR<br>COUNTRY OF REF DOCUMENT : GB                                   |
| EP1152145 A2 | 20040526 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT : FR<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE<br>FEES<br>LAPSED DATE : 20040526 |
| EP1152145 A2 | 20040526 | LSGT | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                            | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D                                                                           |
| EP1152145 A2 | 20050518 | LSGT | +26N  | NO OPPOSITION<br>FILED                                                                                     | EFFECTIVE DATE : 20050301                                                                                                      |
| EP1152145 A2 | 20081031 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20080829<br>YEAR OF FEE PAYMENT : 12                                            |
| EP1152145 A2 | 20081231 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20080708<br>YEAR OF FEE PAYMENT : 12                                            |
| EP1152145 A2 | 20100428 | LSLE | -GBPC | GB: EUROPEAN<br>PATENT CEASED<br>THROUGH NON-<br>PAYMENT OF<br>RENEWAL FEE                                 | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20090812                                                                             |
| EP1152145 A2 | 20100730 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT : DE<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE<br>FEES<br>LAPSED DATE : 20100302 |
| EP1152145 A2 | 20101130 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT : GB<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE<br>FEES<br>LAPSED DATE : 20090812 |
| EP1152145 B1 | 20040526 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                                 |                                                                                                                                |
| EP1152145 B1 | 20170812 | PEXP |       | Calculated<br>Patent Term<br>Expiry                                                                        |                                                                                                                                |
| FR2750173 A1 | 19971226 | LSPB | +     | published /<br>reissued                                                                                    |                                                                                                                                |

|               |          |      |       |                                                                 |                                                                      |
|---------------|----------|------|-------|-----------------------------------------------------------------|----------------------------------------------------------------------|
| FR2750173 A1  | 20040402 | LSLE | -ST   | NOTIFICATION OF LAPSE                                           |                                                                      |
| GB2295649 A1  | 19960605 | LSPB | +     | published / reissued                                            |                                                                      |
| GB2295649 A1  | 20100324 | LSLE | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                | EFFECTIVE DATE : 20090713                                            |
| GB2295649 B2  | 19981007 | LSGT | +     | granted / extensions (spc, cpc, pte)                            |                                                                      |
| GB2295649 B2  | 20150713 | PEXP |       | Calculated Patent Term Expiry                                   |                                                                      |
| GB2314379 A1  | 19971224 | LSPB | +     | published / reissued                                            |                                                                      |
| GB2314379 A1  | 20091223 | LSLE | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                | EFFECTIVE DATE : 20090429                                            |
| GB2314379 B2  | 20000322 | LSGT | +     | granted / extensions (spc, cpc, pte)                            |                                                                      |
| GB2314379 B2  | 20170429 | PEXP |       | Calculated Patent Term Expiry                                   |                                                                      |
| GB2320523 A1  | 19980624 | LSPB | +     | published / reissued                                            |                                                                      |
| GB2320523 A1  | 20100324 | LSLE | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                | EFFECTIVE DATE : 20090713                                            |
| GB2320523 B2  | 19981007 | LSGT | +     | granted / extensions (spc, cpc, pte)                            |                                                                      |
| GB2320523 B2  | 20150713 | PEXP |       | Calculated Patent Term Expiry                                   |                                                                      |
| JP09503272 T2 | 19970331 | LSPB | +     | published / reissued                                            |                                                                      |
| JP10054322 A2 | 19980224 | LSPB | +     | published / reissued                                            |                                                                      |
| JP10054322 A2 | 20040907 | LSWD | -A300 | WITHDRAWAL OF APPLICATION BECAUSE OF NO REQUEST FOR EXAMINATION | TEXT : JAPANESE INTERMEDIATE CODE: A300<br>EFFECTIVE DATE : 20040907 |
| JP10103185 A2 | 19980421 | LSPB | +     | published / reissued                                            |                                                                      |
| JP10103185 A2 | 20041102 | LSWD | -A300 | WITHDRAWAL OF APPLICATION BECAUSE OF NO REQUEST FOR EXAMINATION | TEXT : JAPANESE INTERMEDIATE CODE: A300<br>EFFECTIVE DATE : 20041102 |
| JP10110658 A2 | 19980428 | LSPB | +     | published / reissued                                            |                                                                      |
| JP10110658 A2 | 20041102 | LSWD | -A300 | WITHDRAWAL OF APPLICATION BECAUSE OF NO REQUEST FOR EXAMINATION | TEXT : JAPANESE INTERMEDIATE CODE: A300<br>EFFECTIVE DATE : 20041102 |
| JP9503272 T2  | 19970331 | LSPB | +     | published / reissued                                            |                                                                      |
| JP9503272 T2  | 20090319 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)    | DESCRIPTION : PAYMENT UNTIL: 20090409<br>YEAR OF FEE PAYMENT : 10    |
| JP9503272 T2  | 20090324 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)    | DESCRIPTION : PAYMENT UNTIL: 20100409<br>YEAR OF FEE PAYMENT : 11    |
| JP9503272 T2  | 20100323 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)    | DESCRIPTION : PAYMENT UNTIL: 20110409<br>YEAR OF FEE PAYMENT : 12    |
| JP9503272 T2  | 20120315 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)    | DESCRIPTION : PAYMENT UNTIL: 20120409<br>YEAR OF FEE PAYMENT : 13    |

|                 |          |      |       |                                                                                        |                                                                                                                                                                                                                                 |
|-----------------|----------|------|-------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP9503272 T2    | 20130314 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS<br>RENEWAL DATE<br>OF DATABASE)               | DESCRIPTION : PAYMENT UNTIL:<br>20130409<br>YEAR OF FEE PAYMENT : 14                                                                                                                                                            |
| JP9503272 T2    | 20130319 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS<br>RENEWAL DATE<br>OF DATABASE)               | DESCRIPTION : PAYMENT UNTIL:<br>20140409<br>YEAR OF FEE PAYMENT : 15                                                                                                                                                            |
| JP9503272 T2    | 20150317 | LSFE | +R250 | RECEIPT OF<br>ANNUAL FEES                                                              | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: R250                                                                                                                                                                               |
| JP9503272 T2    | 20150719 | LSLE | -EXPY | CANCELLATION<br>BECAUSE OF<br>COMPLETION OF<br>TERM                                    |                                                                                                                                                                                                                                 |
| US2002148444 AA | 20021017 | LSPB | +     | published /<br>reissued                                                                |                                                                                                                                                                                                                                 |
| US5463996 A     | 19951107 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                             |                                                                                                                                                                                                                                 |
| US5463996 A     | 19940926 | LSAS | AS    | ASSIGNMENT                                                                             | OWNER NAME : CATERPILLAR INC.,<br>ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:MALEY, DALE C.;<br>SHINOGLIE, RONALD D.;<br>REEL/FRAME:007202/0955;<br>SIGNING DATES FROM 19940907 TO<br>19940919 |
| US5463996 A     | 19951026 | LSGT | PAT1  | Patented Case                                                                          |                                                                                                                                                                                                                                 |
| US5463996 A     | 19990223 | LSFE | +FPAY | FEE PAYMENT                                                                            | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                         |
| US5463996 A     | 20030328 | LSFE | +FPAY | FEE PAYMENT                                                                            | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                         |
| US5463996 A     | 20070320 | LSFE | +FPAY | FEE PAYMENT                                                                            | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                        |
| US5463996 A     | 20140729 | PEXP |       | Calculated<br>Patent Term<br>Expiry                                                    |                                                                                                                                                                                                                                 |
| US5669355 A     | 19970923 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                             |                                                                                                                                                                                                                                 |
| US5669355 A     | 19960830 | LSAS | AS    | ASSIGNMENT                                                                             | OWNER NAME : CATERPILLAR INC.,<br>ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:GIBSON, DENNIS H.;<br>HEFLER, GREGORY W.;<br>REEL/FRAME:008207/0752<br>EFFECTIVE DATE : 19960830                  |
| US5669355 A     | 19970909 | LSGT | PAT1  | Patented Case                                                                          |                                                                                                                                                                                                                                 |
| US5669355 A     | 20010110 | LSFE | +FPAY | FEE PAYMENT                                                                            | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                         |
| US5669355 A     | 20041203 | LSFE | +FPAY | FEE PAYMENT                                                                            | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                         |
| US5669355 A     | 20080930 | LSFE | +FPAY | FEE PAYMENT                                                                            | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                        |
| US5669355 A     | 20160830 | PEXP |       | Calculated<br>Patent Term<br>Expiry                                                    |                                                                                                                                                                                                                                 |
| US5673669 A     | 19971007 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                             |                                                                                                                                                                                                                                 |
| US5673669 A     | 20010305 | LSFE | +FPAY | FEE PAYMENT                                                                            | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                         |
| US5673669 A     | 20050329 | LSFE | +FPAY | FEE PAYMENT                                                                            | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                         |
| US5673669 A     | 20091007 | LSLE | -LAPS | LAPSE FOR<br>FAILURE TO PAY<br>MAINTENANCE<br>FEES                                     |                                                                                                                                                                                                                                 |
| US5673669 A     | 20091102 | LSLE | -PEX1 | Patent Expired<br>Due to<br>NonPayment of<br>Maintenance<br>Fees Under 37<br>CFR 1.362 |                                                                                                                                                                                                                                 |
| US5673669 A     | 20091124 | LSLE | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE                                        | EFFECTIVE DATE : 20091007                                                                                                                                                                                                       |

|             |          |      |       |                                                                         |                                                                                                                                                                                                                                                        |
|-------------|----------|------|-------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FEE         |          |      |       |                                                                         |                                                                                                                                                                                                                                                        |
| US5673669 A | 20150612 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                                                                                                                                        |
| US5687693 A | 19971118 | LSGT | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                                                                                        |
| US5687693 A | 19960830 | LSAS | AS    | ASSIGNMENT                                                              | OWNER NAME : CATERPILLAR INC., ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:CHEN, SHIKUI K.; HEFLER, GREGORY W.;<br>REEL/FRAME:008245/0828<br>EFFECTIVE DATE : 19960830                                                    |
| US5687693 A | 20010305 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                |
| US5687693 A | 20050329 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                |
| US5687693 A | 20091118 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                                                                                                                                                                                                                                                        |
| US5687693 A | 20091214 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                                                                                                                                                                                                        |
| US5687693 A | 20100105 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20091118                                                                                                                                                                                                                              |
| US5687693 A | 20160830 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                                                                                                                                        |
| US5697342 A | 19971216 | LSGT | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                                                                                        |
| US5697342 A | 19960911 | LSAS | AS    | ASSIGNMENT                                                              | OWNER NAME : CATERPILLAR INC., ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:ANDERSON, MICHAEL D.; GIBSON, DENNIS H.; HEFLER, GREGORY W.; AND OTHERS;<br>REEL/FRAME:008173/0581;<br>SIGNING DATES FROM 19960824 TO 19960830 |
| US5697342 A | 20010305 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                |
| US5697342 A | 20050527 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                |
| US5697342 A | 20091216 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                                                                                                                                                                                                                                                        |
| US5697342 A | 20100111 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                                                                                                                                                                                                        |
| US5697342 A | 20100202 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20091216                                                                                                                                                                                                                              |
| US5697342 A | 20160621 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                                                                                                                                        |
| US5738075 A | 19980414 | LSGT | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                                                                                        |
| US5738075 A | 19970528 | LSAS | AS    | ASSIGNMENT                                                              | OWNER NAME : CATERPILLAR INC., ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:CHEN, SHIKUI K.; HEFLER, GREGORY W.;<br>REEL/FRAME:008689/0347<br>EFFECTIVE DATE : 19960830                                                    |
| US5738075 A | 20010921 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                |
| US5738075 A | 20050927 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                |

|              |          |      |       |                                                                         |                                                                                                                                                                                                                    |
|--------------|----------|------|-------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US5738075 A  | 20100414 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                                                                                                                                                                                                                    |
| US5738075 A  | 20100510 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                                                                                                                                                                    |
| US5738075 A  | 20100601 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20100414                                                                                                                                                                                          |
| US5738075 A  | 20170528 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                                                                                                    |
| US5826562 A  | 19981027 | LSGT | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                                                    |
| US5826562 A  | 19961213 | LSAS | AS    | ASSIGNMENT                                                              | OWNER NAME : CATERPILLAR INC., ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:CHEN, SHIKUI K.; HEFLER, GREGORY W.;<br>REEL/FRAME:008380/0546<br>EFFECTIVE DATE : 19961115                |
| US5826562 A  | 19980921 | LSGT | PAT1  | Patented Case                                                           |                                                                                                                                                                                                                    |
| US5826562 A  | 20020312 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                            |
| US5826562 A  | 20060328 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                            |
| US5826562 A  | 20100323 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                           |
| US5826562 A  | 20161213 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                                                                                                    |
| US6065450 A  | 20000523 | LSGT | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                                                    |
| US6065450 A  | 20000511 | LSGT | PAT1  | Patented Case                                                           |                                                                                                                                                                                                                    |
| US6065450 A  | 20030926 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                            |
| US6065450 A  | 20070914 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                            |
| US6065450 A  | 20110923 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                           |
| US6065450 A  | 20180402 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                                                                                                    |
| US6082332 A  | 20000704 | LSGT | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                                                    |
| US6082332 A  | 19981105 | LSAS | AS    | ASSIGNMENT                                                              | OWNER NAME : CATERPILLAR INC., ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:HEFLER, GREGORY W.; CHEN, SHIKUI K.;<br>REEL/FRAME:009572/0630;<br>SIGNING DATES FROM 19981021 TO 19981028 |
| US6082332 A  | 20000615 | LSGT | PAT1  | Patented Case                                                           |                                                                                                                                                                                                                    |
| US6082332 A  | 20010508 | LSRE | CC    | CERTIFICATE OF CORRECTION                                               |                                                                                                                                                                                                                    |
| US6082332 A  | 20031223 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                            |
| US6082332 A  | 20071219 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                            |
| US6082332 A  | 20111229 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                           |
| US6082332 A  | 20181105 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                                                                                                    |
| US6425375 BA | 20020730 | LSGT | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                                                    |
| US6425375 BA | 20030422 | LSRE | CC    | CERTIFICATE OF                                                          |                                                                                                                                                                                                                    |

|              |          |      |       | CORRECTION                                                              |                                                                                                                                |
|--------------|----------|------|-------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| US6425375 BA | 20051228 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                                                                                                        |
| US6425375 BA | 20100730 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                                                                                                                                |
| US6425375 BA | 20100830 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                                                                                |
| US6425375 BA | 20100921 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20100730                                                                                                      |
| US6425375 BA | 20200501 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                |
| US6575137 BB | 20030610 | LSGT | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                |
| US6575137 BB | 20061116 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                                                                                                        |
| US6575137 BB | 20110610 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                                                                                                                                |
| US6575137 BB | 20110711 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                                                                                |
| US6575137 BB | 20110802 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20110610                                                                                                      |
| US6575137 BB | 20220611 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                |
| WO0028208 A1 | 20000518 | LSPB | +     | published / reissued                                                    |                                                                                                                                |
| WO0028208 A1 | 20000217 | LSNP | ENP   | ENTRY INTO THE NATIONAL PHASE IN:                                       | REF COUNTRY CODE : AU<br>REF DOCUMENT NUMBER : 2000 14518<br>KIND CODE OF REF DOCUMENT : A<br>FORMAT OF REF DOCUMENT (F/P) : F |
| WO0034646 A1 | 20000615 | LSPB | +     | published / reissued                                                    |                                                                                                                                |
| WO0034646 A1 | 20011219 | LSNE | -122  | EP: PCT APPLICATION NON-ENTRY IN EUROPEAN PHASE                         |                                                                                                                                |
| WO9603853 A2 | 19960215 | LSPB | +     | published / reissued                                                    |                                                                                                                                |



CH  
 COUNTRY OF REF DOCUMENT :  
 CY  
 COUNTRY OF REF DOCUMENT :  
 CZ  
 COUNTRY OF REF DOCUMENT :  
 DE  
 COUNTRY OF REF DOCUMENT :  
 DK  
 COUNTRY OF REF DOCUMENT :  
 EE  
 COUNTRY OF REF DOCUMENT :  
 ES  
 COUNTRY OF REF DOCUMENT :  
 FI  
 COUNTRY OF REF DOCUMENT :  
 FR  
 COUNTRY OF REF DOCUMENT :  
 GB  
 COUNTRY OF REF DOCUMENT :  
 GR  
 COUNTRY OF REF DOCUMENT :  
 HU  
 COUNTRY OF REF DOCUMENT :  
 IE  
 COUNTRY OF REF DOCUMENT :  
 IS  
 COUNTRY OF REF DOCUMENT :  
 IT  
 COUNTRY OF REF DOCUMENT :  
 LI  
 COUNTRY OF REF DOCUMENT :  
 LT  
 COUNTRY OF REF DOCUMENT :  
 LU  
 COUNTRY OF REF DOCUMENT :  
 LV  
 COUNTRY OF REF DOCUMENT :  
 MC  
 COUNTRY OF REF DOCUMENT :  
 NL  
 COUNTRY OF REF DOCUMENT :  
 PL  
 COUNTRY OF REF DOCUMENT :  
 PT  
 COUNTRY OF REF DOCUMENT :  
 RO  
 COUNTRY OF REF DOCUMENT :  
 SE  
 COUNTRY OF REF DOCUMENT :  
 SI  
 COUNTRY OF REF DOCUMENT :  
 SK  
 COUNTRY OF REF DOCUMENT :  
 TR

|              |          |      |      |                                                            |                                                                                               |
|--------------|----------|------|------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| EP1921307 A1 | 20090624 | LSES | +17Q | FIRST<br>EXAMINATION<br>REPORT                             | EFFECTIVE DATE : 20090520                                                                     |
| EP1921307 A1 | 20100324 | LSAS | RAP1 | TRANSFER OF<br>RIGHTS OF AN EP<br>PUBLISHED<br>APPLICATION | PARTYTYPE : OWNER<br>OWNER : DELPHI TECHNOLOGIES<br>HOLDING S.A.R.L.                          |
| EP1921307 A1 | 20120314 | LSRE | RIC1 | CLASSIFICATION<br>(CORRECTION)                             | CLASSIFICATIONSCHEME : IPC<br>CLASSIFICATIONSYMBOL : F02M<br>57/02<br>20060101AFI20120208BHEP |
| EP1921307 A1 | 20120314 | LSRE | RIC1 | CLASSIFICATION<br>(CORRECTION)                             | CLASSIFICATIONSCHEME : IPC<br>CLASSIFICATIONSYMBOL : F02M<br>59/46<br>20060101ALI20120208BHEP |
| EP1921307 A1 | 20120314 | LSRE | RIC1 | CLASSIFICATION<br>(CORRECTION)                             | CLASSIFICATIONSCHEME : IPC<br>CLASSIFICATIONSYMBOL : F02M<br>63/02<br>20060101ALI20120208BHEP |
| EP1921307 A1 | 20120314 | LSRE | RIC1 | CLASSIFICATION<br>(CORRECTION)                             | CLASSIFICATIONSCHEME : IPC<br>CLASSIFICATIONSYMBOL : F02M<br>47/02<br>20060101ALI20120208BHEP |
| EP1921307 A1 | 20120314 | LSRE | RIC1 | CLASSIFICATION<br>(CORRECTION)                             | CLASSIFICATIONSCHEME : IPC<br>CLASSIFICATIONSYMBOL : F02M<br>59/36<br>20060101ALI20120208BHEP |
| EP1921307 A1 | 20120314 | LSRE | RIC1 | CLASSIFICATION<br>(CORRECTION)                             | CLASSIFICATIONSCHEME : IPC<br>CLASSIFICATIONSYMBOL : F02M<br>63/00<br>20060101ALI20120208BHEP |
| EP1921307 A1 | 20120815 | LSNP | REG  | REFERENCE TO A<br>NATIONAL CODE                            | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                            |
| EP1921307 A1 | 20120815 | LSGT | REG  | REFERENCE TO A<br>NATIONAL CODE                            | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D                                          |

|              |          |      |       |                                                                                       |                                                                                                                                                                                                             |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1921307 A1 | 20120815 | LSNP | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : AT<br>REF LEGAL EVENT CODE : REF<br>REF DOCUMENT NUMBER : 570980<br>COUNTRY OF REF DOCUMENT : AT<br>KIND CODE OF REF DOCUMENT : T<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20120815  |
| EP1921307 A1 | 20120912 | LSGT | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : FG4D                                                                                                                                                        |
| EP1921307 A1 | 20121011 | LSPB | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R096<br>REF DOCUMENT NUMBER : 602006031399<br>COUNTRY OF REF DOCUMENT : DE<br>EFFECTIVE DATE : 20121011                                                     |
| EP1921307 A1 | 20121219 | LSRV | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : NL<br>REF LEGAL EVENT CODE : VDEP<br>EFFECTIVE DATE : 20120815                                                                                                                           |
| EP1921307 A1 | 20130115 | LSRV | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : AT<br>REF LEGAL EVENT CODE : MK05<br>REF DOCUMENT NUMBER : 570980<br>COUNTRY OF REF DOCUMENT : AT<br>KIND CODE OF REF DOCUMENT : T<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20120815 |
| EP1921307 A1 | 20130131 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : AT<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815      |
| EP1921307 A1 | 20130131 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : LT<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815      |
| EP1921307 A1 | 20130131 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : FI<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815      |
| EP1921307 A1 | 20130131 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : IS<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20121215      |
| EP1921307 A1 | 20130131 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : CY<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815      |
| EP1921307 A1 | 20130228 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : IS<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20121215      |

|              |          |      |       |                                                                                       |                                                                                                                                                                                                        |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1921307 A1 | 20130228 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : PT<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20121217 |
| EP1921307 A1 | 20130228 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : LV<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |
| EP1921307 A1 | 20130228 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : BE<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |
| EP1921307 A1 | 20130228 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : SE<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |
| EP1921307 A1 | 20130228 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : SI<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |
| EP1921307 A1 | 20130228 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : PL<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |
| EP1921307 A1 | 20130228 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : GR<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20121116 |
| EP1921307 A1 | 20130228 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : CY<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |
| EP1921307 A1 | 20130329 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : NL<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |
| EP1921307 A1 | 20130430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : DK<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |

|              |          |      |       |                                                                                       |                                                                                                                                                                                                          |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1921307 A1 | 20130430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : CZ<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |
| EP1921307 A1 | 20130430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : EE<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |
| EP1921307 A1 | 20130430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : RO<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |
| EP1921307 A1 | 20130531 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : SK<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |
| EP1921307 A1 | 20130531 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : RO<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |
| EP1921307 A1 | 20130531 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : IT<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815 |
| EP1921307 A1 | 20130628 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                                       |
| EP1921307 A1 | 20130724 | LSGT | +26N  | NO OPPOSITION FILED                                                                   | EFFECTIVE DATE : 20130516                                                                                                                                                                                |
| EP1921307 A1 | 20130724 | LSLE | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                         | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20121115                                                                                                                                                       |
| EP1921307 A1 | 20130731 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : LI<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20121130                                                                               |
| EP1921307 A1 | 20130731 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : CH<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20121130                                                                               |
| EP1921307 A1 | 20130731 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : BG<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20121115 |
| EP1921307 A1 | 20130814 | LSLE | REG   | REFERENCE TO A                                                                        | REF COUNTRY CODE : IE                                                                                                                                                                                    |

|              |          |      |       |                                                                                       |                                                                                                                                                                                                                                                                                                                             |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | NATIONAL CODE                                                                         | REF LEGAL EVENT CODE : MM4A                                                                                                                                                                                                                                                                                                 |
| EP1921307 A1 | 20130912 | LSRE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R097<br>REF DOCUMENT NUMBER : 602006031399<br>COUNTRY OF REF DOCUMENT : DE<br>EFFECTIVE DATE : 20130516                                                                                                                                                                     |
| EP1921307 A1 | 20131031 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : IE<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20121108                                                                                                                                                                                                    |
| EP1921307 A1 | 20131031 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : ES<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20121126                                                                                                                      |
| EP1921307 A1 | 20131129 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : GB<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20121115                                                                                                                                                                                                    |
| EP1921307 A1 | 20140430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : TR<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20120815                                                                                                                      |
| EP1921307 A1 | 20140430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : MC<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20121130                                                                                                                                                                                                    |
| EP1921307 A1 | 20140530 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : LU<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20121108                                                                                                                                                                                                    |
| EP1921307 A1 | 20140731 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : HU<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20061108                                                                                                                      |
| EP1921307 A1 | 20140807 | LSAS | REG   | REFERENCE TO A NATIONAL CODE                                                          | PARTYTYPE : OWNER<br>REF COUNTRY CODE : DE<br>OWNER : DELPHI INTERNATIONAL OPERATIONS LUXEMBOURG S.A, LU<br>REF LEGAL EVENT CODE : R081<br>REF DOCUMENT NUMBER : 602006031399<br>COUNTRY OF REF DOCUMENT : DE<br>OLDPARTY : FORMER OWNER: DELPHI TECHNOLOGIES HOLDING S.A.R.L., BASCHARAGE, LU<br>EFFECTIVE DATE : 20140702 |
| EP1921307 A1 | 20151117 | LSFE | REG   | REFERENCE TO A NATIONAL CODE                                                          | COUNTRY OF REF DOCUMENT : FR<br>REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 10                                                                                                                                                                                                            |
| EP1921307 A1 | 20160129 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20151127<br>YEAR OF FEE PAYMENT : 10                                                                                                                                                                                                                                         |
| EP1921307 A1 | 20160229 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID                                                           | COUNTRY OF REF DOCUMENT : FR                                                                                                                                                                                                                                                                                                |

|                 |          |      |       |                                                         |                                                                                                                                                                                                                                   |
|-----------------|----------|------|-------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       | TO NATIONAL<br>OFFICE                                   | PAYMENT DATE : 20151117<br>YEAR OF FEE PAYMENT : 10                                                                                                                                                                               |
| EP1921307 A1    | 20161123 | LSFE | REG   | REFERENCE TO A<br>NATIONAL CODE                         | COUNTRY OF REF DOCUMENT :<br>FR<br>REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 11                                                                                                               |
| EP1921307 A1    | 20170131 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES PAID<br>TO NATIONAL<br>OFFICE | COUNTRY OF REF DOCUMENT :<br>FR<br>PAYMENT DATE : 20161123<br>YEAR OF FEE PAYMENT : 11                                                                                                                                            |
| EP1921307 A1    | 20170131 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES PAID<br>TO NATIONAL<br>OFFICE | COUNTRY OF REF DOCUMENT :<br>DE<br>PAYMENT DATE : 20161123<br>YEAR OF FEE PAYMENT : 11                                                                                                                                            |
| EP1921307 B1    | 20120815 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)              |                                                                                                                                                                                                                                   |
| EP1921307 B1    | 20261108 | PEXP |       | Calculated Patent<br>Term Expiry                        |                                                                                                                                                                                                                                   |
| US2008154479 AA | 20080626 | LSPB | +     | published /<br>reissued                                 |                                                                                                                                                                                                                                   |
| US7574995 BB    | 20090818 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)              |                                                                                                                                                                                                                                   |
| US7574995 BB    | 20071108 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : DELPHI<br>TECHNOLOGIES, INC., MICHIGAN<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:GRAHAM, MARK S.;<br>REEL/FRAME:020152/0537<br>EFFECTIVE DATE : 20071010                        |
| US7574995 BB    | 20090729 | LSGT | PAT1  | Patented Case                                           |                                                                                                                                                                                                                                   |
| US7574995 BB    | 20100412 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : DELPHI TECHNOLOGIES<br>HOLDING S.ARL,LUXEMBOURG<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:DELPHI<br>TECHNOLOGIES, INC.;<br>REEL/FRAME:024233/0854<br>EFFECTIVE DATE : 20100406  |
| US7574995 BB    | 20100412 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : DELPHI TECHNOLOGIES<br>HOLDING S.ARL, LUXEMBOURG<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:DELPHI<br>TECHNOLOGIES, INC.;<br>REEL/FRAME:024233/0854<br>EFFECTIVE DATE : 20100406 |
| US7574995 BB    | 20130219 | LSFE | +FPAY | FEE PAYMENT                                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                           |
| US7574995 BB    | 20140217 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : DELPHI<br>INTERNATIONAL OPERATIONS<br>LUXEMBOURG S.A.R.L<br>OLDPARTY : MERGER;<br>ASSIGNOR:DELPHI<br>TECHNOLOGIES HOLDING<br>S.A.R.L.;<br>REEL/FRAME:032227/0742<br>EFFECTIVE DATE : 20140116        |
| US7574995 BB    | 20170220 | LSFE | +FPAY | FEE PAYMENT                                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                           |
| US7574995 BB    | 20271108 | PEXP |       | Calculated Patent<br>Term Expiry                        |                                                                                                                                                                                                                                   |

**Title:** SEMICONDUCTOR APPLICATION INSTALLATION ADAPTED WITH A TEMPERATURE EQUALIZATION SYSTEM

**Abstract:** Source: IN00886KO2009A The primary purpose of the present invention is to provide an fluid circulating installation adapted with a temperature equalization system and fluid transmission duct disposed in a heat carrier existing in solid or liquid state in the nature where presents comparatively larger and more reliable heat carrying capacity. The fluid passes through the solid or gas state semiconductor application installation to regulate the semiconductor application installation for temperature equalization, and flows back to the heat equalization installation disposed in the natural heat carrier of heat for the heat equalization installation providing good heat conduction in the natural heat carrier to provide the operation of temperature equalization regulating function on the backflow of the fluid.

**Classifications:****International (IPC 8-9):** G01K11/00 (Advanced/Invention)**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| IN00886KO2009 A    | 20101224         | IN2009KO00886      | 20090619         |

**Probable Assignee:** TAI HER YANG**Assignee(s):** TAI HER YANG**Inventor(s):** TAI HER YANG**Legal status (INPADOC)**[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code | Event                | Details |
|-----------------|---------------|-------------|------|----------------------|---------|
| IN00886KO2009 A | 20101224      | LSPB        | +    | published / reissued |         |

**Title:** TEMPERATURE UNIFYING AND HEAT STORING SYSTEM OF SEMICONDUCTOR HEAT LOSS THOUGH NATURAL TEMPERATURE MAINTAINING MEMBER

**Abstract:** Source: US2012097361A The primary purpose of the present invention is to provide a heat equalizer and the fluid transmission duct disposed in a heat carrier existing in solid state in the nature where presents comparatively larger and more stable heat carrying capacity for passing through the fluid. The fluid passes through the solid or gas state semiconductor application installation to regulate temperature equalization of the semiconductor application installation and flows back to the heat equalization installation disposed in the natural heat carrier for the heat equalization installation providing good heat conduction in the natural heat carrier to provide the operation of temperature equalization regulating function on the backflow of the fluid, and through the heat equalizer to transfer thermal energy to the heat storing block constituted by the surrounding natural heat carrier so as to store heat for releasing thermal energy to the specified heat releasing target.

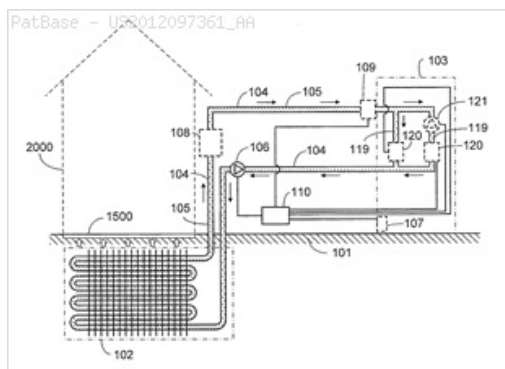
**Classifications:**

**International (IPC 8-9):** F24J2/00 F24J3/08 F28D15/00 F28D15/02 F28D20/00 F28F27/00 G05D23/00 H05K7/20 (Advanced/Invention)

**CPC:** Y02E60/142 F28D15/00 F28D20/0052 F28D2021/0028 Y02E10/60 H02S40/44

**European:** F28D15/00 F28D20/00D R28D21/00T50

**US:** 165/104.11 165/104.110S 165/45 165/45P 236/1C 62/259.2 62/260



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN103376008 A      | 20131030         | CN201210113221     | 20120417         |
| CN202614051 U      | 20121219         | CN201220162456U    | 20120417         |
| TW201345393 A      | 20131101         | TW20120113542      | 20120417         |
| TWM454522 Y        | 20130601         | TW20120207037U     | 20120417         |
| US2012097361 AA    | 20120426         | US20100909940      | 20101022         |
| US8757504 BB       | 20140624         | US20100909940      | 20101022         |

**Priority:**

CN201210113221 20120417 CN201220162456U 20120417 US20100909940 20101022  
TW20120113542 20120417 TW20120207037U 20120417

**Probable Assignee:**

YANG TAIHE

**Assignee(s):** (std):

YANG TAI HER ; YANG TAIHE

**Inventor(s):** (std):

YANG TAI HER ; YANG TAIHE

**Agent(s):**

BACON AND THOMAS PLLC

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code | Event                                        | Details |
|-----------------|---------------|-------------|------|----------------------------------------------|---------|
| CN103376008 A   | 20131030      | LSPB        | +    | published / reissued                         |         |
| CN103376008 A   | 20131030      | LSPB        | +C06 | PUBLICATION                                  |         |
| CN202614051 U   | 20121219      | LSGT        | +    | granted / extensions (spc, cpc, pte)         |         |
| CN202614051 U   | 20121219      | LSGT        | +C14 | GRANT OF PATENT OR UTILITY MODEL             |         |
| CN202614051 U   | 20220417      | PEXP        |      | Calculated Patent Term Expiry                |         |
| TW201345393 A   | 20131101      | LSPB        | +    | published / reissued                         |         |
| TWM454522 Y     | 20130601      | LSGT        | +    | granted / extensions (spc, cpc, pte)         |         |
| US2012097361 AA | 20120426      | LSPB        | +    | published / reissued                         |         |
| US8757504 BB    | 20140624      | LSGT        | +    | granted / extensions (spc, cpc, pte)         |         |
| US8757504 BB    | 20140604      | LSGT        | PAT1 | Patented Case                                |         |
| US8757504 BB    | 20330129      | PEXP        |      | Calculated Patent Term Expiry (PTA 830 days) |         |

**Title:** WIRELESS VEHICLE LIFT SYSTEM WITH ENHANCED COMMUNICATION AND **CONTROL**

**Abstract:** Source: US2013240300A Wireless portable vehicle lift system incorporating one or more enhanced communication and/or **control** features. The lift system can incorporate enhanced touch screen-enabled functionalities, enhanced multi-processor architectures, and/or enhanced emergency stop features.

**Classifications:**

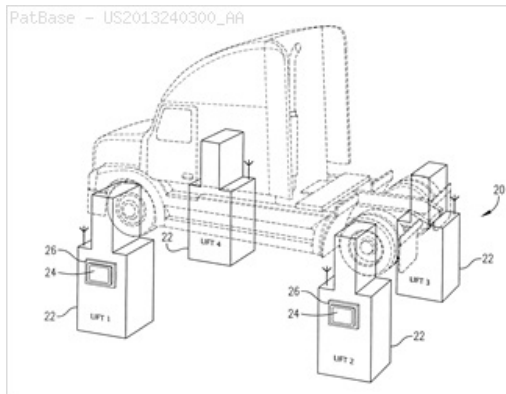
**International (IPC 8-9):** B66B1/34 B66F13/00 B66F3/46 B66F5/00

B66F7/10 B66F7/28 H04B7/24 (Advanced/Invention)

**CPC:** B66F7/28 B66F7/10 B66F5/00 B66F13/00 H04B7/24 B66F3/46

**US:** 1/1 187/203 187/210 187/213 187/247 187/391 254/89R

PatBase - US2013240300\_AA



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2013240300 AA    | 20130919         | US20130835569      | 20130315         |
| US2015114760 AA    | 20150430         | US20140561980      | 20141205         |
| US2016272472 AA    | 20160922         | US20160166884      | 20160527         |
| US2017043985 AA    | 20170216         | US20160340622      | 20161101         |
| US2017088406 AA    | 20170330         | US20160377226      | 20161213         |
| US9334145 BB       | 20160510         | US20140561980      | 20141205         |
| US9352944 BB       | 20160531         | US20130835569      | 20130315         |
| US9593000 BB       | 20170314         | US20160340622      | 20161101         |
| US9656843 BB       | 20170523         | US20160377226      | 20161213         |

**Priority:**

|                |          |                |          |                |          |
|----------------|----------|----------------|----------|----------------|----------|
| US20120612795P | 20120319 | US20120697406P | 20120906 | US20130835569  | 20130315 |
| US20140561980  | 20141205 | US20160166884  | 20160527 | US20120967406P | 20120906 |
| US20160340622  | 20161101 | US20160377226  | 20161213 |                |          |

**Probable Assignee:** GRAY MFG CO INC

**Assignee(s):** (std): GRAY MFG CO INC

**Inventor(s):** (std): FAGAN JOHN E ; JAIPaul LARRY M ; KECK JR WILLIAM R ; MCKEE RALPH S ; MCKEE RALPH SAM ; RUCKER STEPHEN J ; SANDMANN DAVID DWIGHT

**Agent(s):** HOVEY WILLIAMS LLP

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code | Event                | Details                                                                                                                                                                                                                                                     |
|-----------------|---------------|-------------|------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2013240300 AA | 20130919      | LSPB        | +    | published / reissued |                                                                                                                                                                                                                                                             |
| US2013240300 AA | 20131217      | LSAS        | AS   | ASSIGNMENT           | OWNER NAME : GRAY MANUFACTURING COMPANY, INC., MISSOURI<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:FAGAN, JOHN E.; JAIPaul, LARRY M.; MCKEE, RALPH SAM; AND OTHERS; SIGNING DATES FROM 20130531 TO 20131217;<br>REEL/FRAME:031800/0834 |
| US2015114760 AA | 20150430      | LSPB        | +    | published / reissued |                                                                                                                                                                                                                                                             |
| US2015114760 AA | 20141211      | LSAS        | AS   | ASSIGNMENT           | OWNER NAME : GRAY MANUFACTURING COMPANY, INC., MISSOURI<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:FAGAN, JOHN E.; JAIPaul, LARRY M.; MCKEE, RALPH SAM; AND OTHERS; SIGNING DATES FROM 20130531 TO 20131217;<br>REEL/FRAME:034476/0670 |
| US2016272472 AA | 20160922      | LSPB        | +    | published / reissued |                                                                                                                                                                                                                                                             |
| US2016272472 AA | 20160607      | LSAS        | AS   | ASSIGNMENT           | OWNER NAME : GRAY MANUFACTURING COMPANY, INC., MISSOURI<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:FAGAN, JOHN E.; JAIPaul, LARRY M.; MCKEE, RALPH SAM; AND OTHERS; SIGNING DATES FROM 20130531 TO 20131217;<br>REEL/FRAME:034476/0670 |

|                 |          |      |       |                                                     |                                                                                                                                                                                                                                                                                         |
|-----------------|----------|------|-------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       |                                                     | OTHERS; SIGNING DATES FROM<br>20130531 TO 20131217;<br>REEL/FRAME:038827/0615                                                                                                                                                                                                           |
| US2017043985 AA | 20170216 | LSPB | +     | published /<br>reissued                             |                                                                                                                                                                                                                                                                                         |
| US2017043985 AA | 20161102 | LSAS | AS    | ASSIGNMENT                                          | PARTYTYPE : OWNER<br>OWNER : GRAY MANUFACTURING<br>COMPANY, INC., MISSOURI<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:FAGAN, JOHN; JAIPaul,<br>LARRY M.; MCKEE, RALPH SAM; AND<br>OTHERS; SIGNING DATES FROM<br>20130531 TO 20131217;<br>REEL/FRAME:040194/0329    |
| US2017088406 AA | 20170330 | LSPB | +     | published /<br>reissued                             |                                                                                                                                                                                                                                                                                         |
| US2017088406 AA | 20161213 | LSAS | AS    | ASSIGNMENT                                          | PARTYTYPE : OWNER<br>OWNER : GRAY MANUFACTURING<br>COMPANY, INC., MISSOURI<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:FAGAN, JOHN E.; JAIPaul,<br>LARRY M.; MCKEE, RALPH SAM; AND<br>OTHERS; SIGNING DATES FROM<br>20130531 TO 20131217;<br>REEL/FRAME:040724/0112 |
| US2017088406 AA | 20170424 | LSFE | +PPV1 | Publications<br>-- Issue Fee<br>Payment<br>Verified |                                                                                                                                                                                                                                                                                         |
| US9334145 BB    | 20160510 | LSGT | +     | granted /<br>extensions<br>(spc, cpc,<br>pte)       |                                                                                                                                                                                                                                                                                         |
| US9334145 BB    | 20151001 | LSES | NFA1  | Non Final<br>Action Mailed                          |                                                                                                                                                                                                                                                                                         |
| US9334145 BB    | 20160420 | LSGT | PAT1  | Patented<br>Case                                    |                                                                                                                                                                                                                                                                                         |
| US9334145 BB    | 20341205 | PEXP |       | Calculated<br>Patent Term<br>Expiry                 |                                                                                                                                                                                                                                                                                         |
| US9352944 BB    | 20160531 | LSGT | +     | granted /<br>extensions<br>(spc, cpc,<br>pte)       |                                                                                                                                                                                                                                                                                         |
| US9352944 BB    | 20150930 | LSES | NFA1  | Non Final<br>Action Mailed                          |                                                                                                                                                                                                                                                                                         |
| US9352944 BB    | 20160511 | LSGT | PAT1  | Patented<br>Case                                    |                                                                                                                                                                                                                                                                                         |
| US9352944 BB    | 20330315 | PEXP |       | Calculated<br>Patent Term<br>Expiry                 |                                                                                                                                                                                                                                                                                         |
| US9593000 BB    | 20170314 | LSGT | +     | granted /<br>extensions<br>(spc, cpc,<br>pte)       |                                                                                                                                                                                                                                                                                         |
| US9593000 BB    | 20170222 | LSGT | PAT1  | Patented<br>Case                                    |                                                                                                                                                                                                                                                                                         |
| US9593000 BB    | 20361101 | PEXP |       | Calculated<br>Patent Term<br>Expiry                 |                                                                                                                                                                                                                                                                                         |
| US9656843 BB    | 20170523 | LSGT | +     | granted /<br>extensions<br>(spc, cpc,<br>pte)       |                                                                                                                                                                                                                                                                                         |
| US9656843 BB    | 20170503 | LSGT | PAT1  | Patented<br>Case                                    |                                                                                                                                                                                                                                                                                         |
| US9656843 BB    | 20361213 | PEXP |       | Calculated<br>Patent Term<br>Expiry                 |                                                                                                                                                                                                                                                                                         |

**Title:** REMOTE **CONTROL** FISHING ROBOT

**Abstract:** Source: US2014090288A A low-clearance remote **control** fishing robot is disclosed. A domed device casing is mounted between a pair of floats. The top of the device is fitted with a lightweight probe mounted on a spring. Each float has installed within its rear end a pivotal air jet. The air jets are powered by an onboard compressor. Beneath the device casing is a reel of fishing line. An electric motor drives the reel. Sensors are provided to gauge line length and depth and line tension. Onboard depth-finding and fish-finding sonar are provided, as well as other sensing systems, and an above-surface or below surface camera. **Two way** data communication occurs wirelessly with a remote **control** unit. A water-impervious carry case is provided to store the device and remote **control**. A positioning apparatus may be installed for fishing from a fixed position against a boat, pier, or ice hole.

**Classifications:**

**International (IPC 8-9):** A01K91/02 A01K93/00 A01K97/00

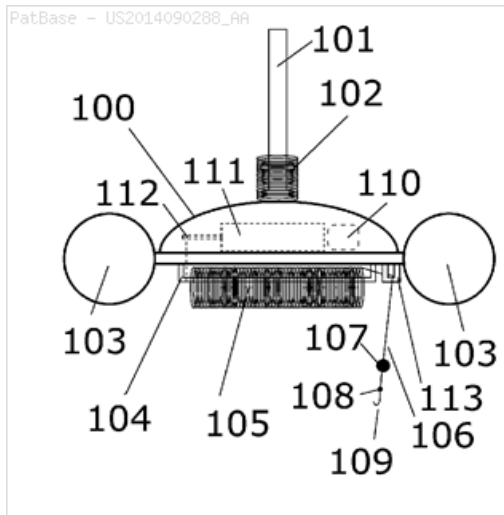
B63B35/14 (Advanced/Invention);

B63B35/00 B63H11/12 (Advanced/Non-invention)

**CPC:** B63B35/14 A01K91/02 A01K93/00 A01K97/00 B63B2035/008

B63H11/12

**US:** 1/1 43/26.1



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2014090288 AA    | 20140403         | US20130043287      | 20131001         |
| US9278737 BB       | 20160308         | US20130043287      | 20131001         |

**Priority:**

US20120708238P 20121001 US20130043287 20131001

**Probable Assignee:** FREEMAN CALEB

**Assignee(s):** (std): FREEMAN CALEB

**Inventor(s):** (std): FREEMAN CALEB

**Agent(s):** GRAY LAW GROUP LTD; ROBERT

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code | Event                                        | Details |
|-----------------|---------------|-------------|------|----------------------------------------------|---------|
| US2014090288 AA | 20140403      | LSPB        | +    | published / reissued                         |         |
| US9278737 BB    | 20160308      | LSGT        | +    | granted / extensions (spc, cpc, pte)         |         |
| US9278737 BB    | 20160217      | LSGT        | PAT1 | Patented Case                                |         |
| US9278737 BB    | 20340502      | PEXP        |      | Calculated Patent Term Expiry (PTA 213 days) |         |



US19850787016 19851015 US19840585905 19840302

**Probable Assignee:** ISCO INC

**Assignee(s):** (std): ISCO INC

**Assignee(s):** ISCO INC A CORP OF NE ; ISCO INC LINCOLN NEBR US ; ISUKO INC

**Inventor(s):** (std): ALLINGTON ROBERT W ; ALLINGTON ROBERT WILLIAM ; ROBAATO UIRIAMU AARINTON

**Inventor(s):** ALLINGTON ROBERT WILLIAM LINCOLN NEBRASKA 68505 US ; ALLINGTON ROBERT WILLIAM LINCOLN NEBRASKA 68502 US

**Designated states:** CH DE FR GB LI NL SE

#### Legal status (INPADOC)

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                                                                                    | Details                                                                      |
|--------------|---------------|-------------|-------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| DE3279571 D1 | 19900426      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                                                  |                                                                              |
| DE3279571 D1 | 20020926      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                                                     |                                                                              |
| DE3279769 D1 | 19900719      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                                                  |                                                                              |
| DE3279769 D1 | 20020926      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                                                     |                                                                              |
| DE3280321 D1 | 19920416      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                                                  |                                                                              |
| DE3280321 D1 | 20020926      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                                                     |                                                                              |
| DE3280335 D1 | 19920604      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                                                  |                                                                              |
| DE3280335 D1 | 20010906      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                                                     |                                                                              |
| DE3578221 D1 | 19910711      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                                                  |                                                                              |
| DE3578221 D1 | 19980212      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                                                     |                                                                              |
| EP0073913 A2 | 19830316      | LSPB        | +     | published / reissued                                                                                     |                                                                              |
| EP0073913 A2 | 19831102      | LSSES       | +17P  | REQUEST FOR EXAMINATION FILED                                                                            | EFFECTIVE DATE : 19830827                                                    |
| EP0073913 A2 | 19890322      | LSLE        | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : SE<br>EFFECTIVE DATE : 19890322                           |
| EP0073913 A2 | 19890322      | LSLE        | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : NL<br>EFFECTIVE DATE : 19890322                           |
| EP0073913 A2 | 19890322      | LSLE        | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : CH<br>EFFECTIVE DATE : 19890322                           |
| EP0073913 A2 | 19890322      | LSLE        | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : LI<br>EFFECTIVE DATE : 19890322                           |
| EP0073913 A2 | 19890630      | LSLE        | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                           |
| EP0073913 A2 | 19890816      | LSLE        | -NLV1 | NL: LAPSED OR ANNULLED DUE TO FAILURE TO FULFILL THE REQUIREMENTS OF ART. 29P AND 29M OF THE PATENTS ACT |                                                                              |
| EP0073913 A2 | 19900321      | LSGT        | +26N  | NO OPPOSITION FILED                                                                                      |                                                                              |
| EP0073913 A2 | 20000925      | LSFE        | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20000925<br>YEAR OF FEE PAYMENT : 19 |
| EP0073913 A2 | 20010716      | LSFE        | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20010716<br>YEAR OF FEE PAYMENT : 20 |
| EP0073913 A2 | 20010727      | LSFE        | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : FR<br>PAYMENT DATE : 20010727<br>YEAR OF FEE PAYMENT : 20 |
| EP0073913 A2 | 20020501      | LSLE        | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM                                       | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT       |

|              |          |      |       |                                                                                                |                                                                                                                        |
|--------------|----------|------|-------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | NAT. OFFICE TO EPO                                                                             | OF DUE FEES<br>EFFECTIVE DATE :<br>20020501                                                                            |
| EP0073913 A2 | 20020718 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE<br>BECAUSE OF EXPIRATION<br>OF PROTECTION<br>EFFECTIVE DATE :<br>20020718 |
| EP0073913 A2 | 20020807 | LSLE | REG   | REFERENCE TO A NATIONAL<br>CODE                                                                | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE :<br>PE20<br>EFFECTIVE DATE :<br>20020718                                |
| EP0073913 B1 | 19890322 | LSGT | +     | granted / extensions (spc,<br>cpc, pte)                                                        |                                                                                                                        |
| EP0153712 A2 | 19850904 | LSPB | +     | published / reissued                                                                           |                                                                                                                        |
| EP0153712 A2 | 19880302 | LSES | +17P  | REQUEST FOR<br>EXAMINATION FILED                                                               | EFFECTIVE DATE :<br>19871219                                                                                           |
| EP0153712 A2 | 19880420 | LSES | +17Q  | FIRST EXAMINATION<br>REPORT                                                                    | EFFECTIVE DATE :<br>19880303                                                                                           |
| EP0153712 A2 | 19910605 | LSGT | +26N  | NO OPPOSITION FILED                                                                            |                                                                                                                        |
| EP0153712 A2 | 19960419 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES<br>PAID TO NATIONAL OFFICE                                              | REF COUNTRY CODE : DE<br>PAYMENT DATE : 19960419<br>YEAR OF FEE PAYMENT : 12                                           |
| EP0153712 A2 | 19971101 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : DE<br>EFFECTIVE DATE :<br>19971101                                                                  |
| EP0153712 A2 | 20030225 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES<br>PAID TO NATIONAL OFFICE                                              | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20030225<br>YEAR OF FEE PAYMENT : 19                                           |
| EP0153712 A2 | 20030228 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES<br>PAID TO NATIONAL OFFICE                                              | REF COUNTRY CODE : FR<br>PAYMENT DATE : 20030228<br>YEAR OF FEE PAYMENT : 19                                           |
| EP0153712 A2 | 20040222 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT<br>OF DUE FEES<br>EFFECTIVE DATE :<br>20040222  |
| EP0153712 A2 | 20041013 | LSLE | -GBPC | GB: EUROPEAN PATENT<br>CEASED THROUGH NON-<br>PAYMENT OF RENEWAL FEE                           | EFFECTIVE DATE :<br>20040222                                                                                           |
| EP0153712 A2 | 20041029 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : FR<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT<br>OF DUE FEES<br>EFFECTIVE DATE :<br>20041029  |
| EP0153712 A2 | 20041203 | LSLE | REG   | REFERENCE TO A NATIONAL<br>CODE                                                                | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST                                                                     |
| EP0153712 B1 | 19900613 | LSGT | +     | granted / extensions (spc,<br>cpc, pte)                                                        |                                                                                                                        |
| EP0153712 B1 | 20050222 | PEXP |       | Calculated Patent Term<br>Expiry                                                               |                                                                                                                        |
| EP0217318 A2 | 19870408 | LSPB | +     | published / reissued                                                                           |                                                                                                                        |
| EP0217318 A2 | 19880302 | LSES | +17P  | REQUEST FOR<br>EXAMINATION FILED                                                               | EFFECTIVE DATE :<br>19871219                                                                                           |
| EP0217318 A2 | 19881102 | LSES | +17Q  | FIRST EXAMINATION<br>REPORT                                                                    | EFFECTIVE DATE :<br>19880915                                                                                           |
| EP0217318 A2 | 19890614 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : SE<br>EFFECTIVE DATE :<br>19890614                                                                  |
| EP0217318 A2 | 19890614 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : NL<br>EFFECTIVE DATE :<br>19890614                                                                  |
| EP0217318 A2 | 19890614 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : LI<br>EFFECTIVE DATE :<br>19890614                                                                  |

|              |          |      |       |                                                                                                          |                                                                                                               |
|--------------|----------|------|-------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| EP0217318 A2 | 19890614 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : CH<br>EFFECTIVE DATE : 19890614                                                            |
| EP0217318 A2 | 19890929 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                            |
| EP0217318 A2 | 19891116 | LSLE | -NLV1 | NL: LAPSED OR ANNULLED DUE TO FAILURE TO FULFILL THE REQUIREMENTS OF ART. 29P AND 29M OF THE PATENTS ACT |                                                                                                               |
| EP0217318 A2 | 19900606 | LSGT | +26N  | NO OPPOSITION FILED                                                                                      |                                                                                                               |
| EP0217318 A2 | 20000925 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20000925<br>YEAR OF FEE PAYMENT : 19                                  |
| EP0217318 A2 | 20010716 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20010716<br>YEAR OF FEE PAYMENT : 20                                  |
| EP0217318 A2 | 20010727 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : FR<br>PAYMENT DATE : 20010727<br>YEAR OF FEE PAYMENT : 20                                  |
| EP0217318 A2 | 20020501 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20020501  |
| EP0217318 A2 | 20020718 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE BECAUSE OF EXPIRATION OF PROTECTION<br>EFFECTIVE DATE : 20020718 |
| EP0217318 A2 | 20020807 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : PE20<br>EFFECTIVE DATE : 20020718                             |
| EP0217318 B1 | 19890614 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                                     |                                                                                                               |
| EP0218163 A2 | 19870415 | LSPB | +     | published / reissued                                                                                     |                                                                                                               |
| EP0218163 A2 | 19880302 | LSES | +17P  | REQUEST FOR EXAMINATION FILED                                                                            | EFFECTIVE DATE : 19871219                                                                                     |
| EP0218163 A2 | 19880907 | LSES | +17Q  | FIRST EXAMINATION REPORT                                                                                 | EFFECTIVE DATE : 19880720                                                                                     |
| EP0218163 A2 | 19920429 | LSGT | +26N  | NO OPPOSITION FILED                                                                                      |                                                                                                               |
| EP0218163 A2 | 19990719 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : SE<br>PAYMENT DATE : 19990719<br>YEAR OF FEE PAYMENT : 18                                  |
| EP0218163 A2 | 19990730 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : NL<br>PAYMENT DATE : 19990730<br>YEAR OF FEE PAYMENT : 18                                  |
| EP0218163 A2 | 19990922 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : DE<br>PAYMENT DATE : 19990922<br>YEAR OF FEE PAYMENT : 18                                  |
| EP0218163 A2 | 20000629 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : CH<br>PAYMENT DATE : 20000629<br>YEAR OF FEE PAYMENT : 19                                  |
| EP0218163 A2 | 20000720 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : SE<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20000720  |
| EP0218163 A2 | 20010201 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : NL<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20010201  |
| EP0218163 A2 | 20010319 | LSLE | -EUG  | SE: EUROPEAN PATENT HAS                                                                                  | REF DOCUMENT NUMBER :                                                                                         |

|              |          |      |       |                                                                                                |                                                                                                                        |
|--------------|----------|------|-------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | LAPSED                                                                                         | 86113316.3<br>FORMAT OF REF DOCUMENT<br>(F/P) : F                                                                      |
| EP0218163 A2 | 20010402 | LSLE | -NLV4 | NL: LAPSED OR ANULLED<br>DUE TO NON-PAYMENT OF<br>THE ANNUAL FEE                               | EFFECTIVE DATE :<br>20010201                                                                                           |
| EP0218163 A2 | 20010501 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT<br>OF DUE FEES<br>EFFECTIVE DATE :<br>20010501  |
| EP0218163 A2 | 20010716 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES<br>PAID TO NATIONAL OFFICE                                              | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20010716<br>YEAR OF FEE PAYMENT : 20                                           |
| EP0218163 A2 | 20010727 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES<br>PAID TO NATIONAL OFFICE                                              | REF COUNTRY CODE : FR<br>PAYMENT DATE : 20010727<br>YEAR OF FEE PAYMENT : 20                                           |
| EP0218163 A2 | 20010731 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : LI<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT<br>OF DUE FEES<br>EFFECTIVE DATE :<br>20010731  |
| EP0218163 A2 | 20010731 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : CH<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT<br>OF DUE FEES<br>EFFECTIVE DATE :<br>20010731  |
| EP0218163 A2 | 20020315 | LSLE | REG   | REFERENCE TO A NATIONAL<br>CODE                                                                | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                     |
| EP0218163 A2 | 20020718 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE<br>BECAUSE OF EXPIRATION<br>OF PROTECTION<br>EFFECTIVE DATE :<br>20020718 |
| EP0218163 A2 | 20020807 | LSLE | REG   | REFERENCE TO A NATIONAL<br>CODE                                                                | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE :<br>PE20<br>EFFECTIVE DATE :<br>20020718                                |
| EP0218163 B1 | 19910508 | LSGT | +     | granted / extensions (spc,<br>cpc, pte)                                                        |                                                                                                                        |
| EP0218163 B1 | 20020719 | PEXP |       | Calculated Patent Term<br>Expiry                                                               |                                                                                                                        |
| EP0222123 A2 | 19870520 | LSPB | +     | published / reissued                                                                           |                                                                                                                        |
| EP0222123 A2 | 19880302 | LSES | +17P  | REQUEST FOR<br>EXAMINATION FILED                                                               | EFFECTIVE DATE :<br>19871219                                                                                           |
| EP0222123 A2 | 19880907 | LSES | +17Q  | FIRST EXAMINATION<br>REPORT                                                                    | EFFECTIVE DATE :<br>19880722                                                                                           |
| EP0222123 A2 | 19920311 | LSGT | +26N  | NO OPPOSITION FILED                                                                            |                                                                                                                        |
| EP0222123 A2 | 19950717 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES<br>PAID TO NATIONAL OFFICE                                              | REF COUNTRY CODE : SE<br>PAYMENT DATE : 19950717<br>YEAR OF FEE PAYMENT : 14                                           |
| EP0222123 A2 | 19950731 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES<br>PAID TO NATIONAL OFFICE                                              | REF COUNTRY CODE : NL<br>PAYMENT DATE : 19950731<br>YEAR OF FEE PAYMENT : 14                                           |
| EP0222123 A2 | 19950811 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES<br>PAID TO NATIONAL OFFICE                                              | REF COUNTRY CODE : CH<br>PAYMENT DATE : 19950811<br>YEAR OF FEE PAYMENT : 14                                           |
| EP0222123 A2 | 19960720 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : SE<br>EFFECTIVE DATE :<br>19960720                                                                  |
| EP0222123 A2 | 19960731 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : CH<br>EFFECTIVE DATE :<br>19960731                                                                  |
| EP0222123 A2 | 19960731 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM                       | REF COUNTRY CODE : LI<br>EFFECTIVE DATE :<br>19960731                                                                  |

|               |          |      |       |                                                                                                                      |                                                                                                                                                                                                                               |
|---------------|----------|------|-------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP0222123 A2  | 19970201 | LSLE | -PG25 | NAT. OFFICE TO EPO<br>LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE : NL<br>EFFECTIVE DATE :<br>19970201                                                                                                                                                                         |
| EP0222123 A2  | 19970314 | LSLE | REG   | REFERENCE TO A NATIONAL<br>CODE                                                                                      | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                                                            |
| EP0222123 A2  | 19970401 | LSLE | -NLV4 | NL: LAPSED OR ANULLED<br>DUE TO NON-PAYMENT OF<br>THE ANNUAL FEE                                                     | EFFECTIVE DATE :<br>19970201                                                                                                                                                                                                  |
| EP0222123 A2  | 19970407 | LSLE | -EUG  | SE: EUROPEAN PATENT HAS<br>LAPSED                                                                                    | REF DOCUMENT NUMBER :<br>86113315.5<br>FORMAT OF REF DOCUMENT<br>(F/P) : F                                                                                                                                                    |
| EP0222123 A2  | 20000925 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES<br>PAID TO NATIONAL OFFICE                                                                    | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20000925<br>YEAR OF FEE PAYMENT : 19                                                                                                                                                  |
| EP0222123 A2  | 20010716 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES<br>PAID TO NATIONAL OFFICE                                                                    | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20010716<br>YEAR OF FEE PAYMENT : 20                                                                                                                                                  |
| EP0222123 A2  | 20010727 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES<br>PAID TO NATIONAL OFFICE                                                                    | REF COUNTRY CODE : FR<br>PAYMENT DATE : 20010727<br>YEAR OF FEE PAYMENT : 20                                                                                                                                                  |
| EP0222123 A2  | 20020501 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO                       | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-PAYMENT<br>OF DUE FEES<br>EFFECTIVE DATE :<br>20020501                                                                                                         |
| EP0222123 A2  | 20020718 | LSLE | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO                       | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE<br>BECAUSE OF EXPIRATION<br>OF PROTECTION<br>EFFECTIVE DATE :<br>20020718                                                                                                        |
| EP0222123 A2  | 20020807 | LSLE | REG   | REFERENCE TO A NATIONAL<br>CODE                                                                                      | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE :<br>PE20<br>EFFECTIVE DATE :<br>20020718                                                                                                                                       |
| EP0222123 B1  | 19910320 | LSGT | +     | granted / extensions (spc,<br>cpc, pte)                                                                              |                                                                                                                                                                                                                               |
| EP0222123 B1  | 20020719 | PEXP |       | Calculated Patent Term<br>Expiry                                                                                     |                                                                                                                                                                                                                               |
| JP1752761 C3  | 19930408 | LSGT | +     | granted / extensions (spc,<br>cpc, pte)                                                                              |                                                                                                                                                                                                                               |
| JP1752761 C3  | 20020909 | PEXP |       | Calculated Patent Term<br>Expiry                                                                                     |                                                                                                                                                                                                                               |
| JP2075753 C3  | 19960725 | LSGT | +     | granted / extensions (spc,<br>cpc, pte)                                                                              |                                                                                                                                                                                                                               |
| JP2075753 C3  | 20101130 | PEXP |       | Calculated Patent Term<br>Expiry                                                                                     |                                                                                                                                                                                                                               |
| JP3179257 A2  | 19910805 | LSPB | +     | published / reissued                                                                                                 |                                                                                                                                                                                                                               |
| JP4039033 B4  | 19920626 | LSPB | +     | published / reissued                                                                                                 |                                                                                                                                                                                                                               |
| JP58055855 A2 | 19830402 | LSPB | +     | published / reissued                                                                                                 |                                                                                                                                                                                                                               |
| JP7099366 B4  | 19951025 | LSPB | +     | published / reissued                                                                                                 |                                                                                                                                                                                                                               |
| US4422942 A   | 19831227 | LSGT | +     | granted / extensions (spc,<br>cpc, pte)                                                                              |                                                                                                                                                                                                                               |
| US4422942 A   | 19810909 | LSAS | AS    | ASSIGNMENT                                                                                                           | OWNER NAME : ISCO, INC.<br>4700 SUPERIOR, LINCOLN,<br>NEBRASKA 68504<br>DESCRIPTION :<br>ASSIGNMENT OF<br>ASSIGNORS INTEREST.;<br>ASSIGNOR:ALLINGTON,<br>ROBERT W.;<br>REEL/FRAME:003921/0062<br>EFFECTIVE DATE :<br>19810908 |
| US4422942 A   | 19831027 | LSGT | PAT1  | Patented Case                                                                                                        |                                                                                                                                                                                                                               |
| US4422942 A   | 19870102 | LSFE | +FPAY | FEE PAYMENT                                                                                                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                       |
| US4422942 A   | 19910103 | LSFE | +FPAY | FEE PAYMENT                                                                                                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                       |

|             |          |      |       |                                                  |                                                                                                                                                                                                                              |
|-------------|----------|------|-------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US4422942 A | 19950623 | LSFE | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                     |
| US4769153 A | 19880906 | LSGT | +     | granted / extensions (spc, cpc, pte)             |                                                                                                                                                                                                                              |
| US4769153 A | 19860902 | LSAS | AS    | ASSIGNMENT                                       | OWNER NAME : ISCO, INC.,<br>4700 SUPERIOR ST,<br>LINCOLN NE A CORP OF<br>DESCRIPTION :<br>ASSIGNMENT OF<br>ASSIGNORS INTEREST.;<br>ASSIGNOR:ALLINGTON,<br>ROBERT W.;<br>REEL/FRA:004597/0785<br>EFFECTIVE DATE :<br>19860828 |
| US4769153 A | 19860902 | LSAS | AS    | ASSIGNMENT                                       | OWNER NAME : ISCO, INC.,<br>A CORP OF NE,NEBRASKA<br>DESCRIPTION :<br>ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:ALLINGTON,<br>ROBERT W.;<br>REEL/FRA:004597/0785<br>EFFECTIVE DATE :<br>19860828                      |
| US4769153 A | 19880706 | LSGT | PAT1  | Patented Case                                    |                                                                                                                                                                                                                              |
| US4769153 A | 19920228 | LSFE | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                      |
| US4769153 A | 19960305 | LSFE | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                      |
| US4769153 A | 20000903 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY<br>MAINTENANCE FEES     |                                                                                                                                                                                                                              |
| US4769153 A | 20001107 | LSLE | -FP   | EXPIRED DUE TO FAILURE<br>TO PAY MAINTENANCE FEE | EFFECTIVE DATE :<br>20000906                                                                                                                                                                                                 |
| US4772388 A | 19880920 | LSGT | +     | granted / extensions (spc, cpc, pte)             |                                                                                                                                                                                                                              |
| US4772388 A | 19880802 | LSGT | PAT1  | Patented Case                                    |                                                                                                                                                                                                                              |
| US4772388 A | 19920318 | LSFE | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                      |
| US4772388 A | 19960318 | LSFE | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                      |
| US4772388 A | 19991026 | LSFE | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                     |
| US4775481 A | 19881004 | LSGT | +     | granted / extensions (spc, cpc, pte)             |                                                                                                                                                                                                                              |
| US4775481 A | 19880803 | LSGT | PAT1  | Patented Case                                    |                                                                                                                                                                                                                              |
| US4775481 A | 19920407 | LSFE | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                      |
| US4775481 A | 19960402 | LSFE | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                      |
| US4775481 A | 20000309 | LSFE | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                     |
| US4781824 A | 19881101 | LSGT | +     | granted / extensions (spc, cpc, pte)             |                                                                                                                                                                                                                              |
| US4781824 A | 19860902 | LSAS | AS    | ASSIGNMENT                                       | OWNER NAME : ISCO, INC.,<br>4700 SUPERIOR STREET,<br>LINCOLN, NE., 68<br>DESCRIPTION :<br>ASSIGNMENT OF<br>ASSIGNORS INTEREST.;<br>ASSIGNOR:ALLINGTON,<br>ROBERT W.;<br>REEL/FRA:004597/0773<br>EFFECTIVE DATE :<br>19860828 |
| US4781824 A | 19860902 | LSAS | AS    | ASSIGNMENT                                       | OWNER NAME : ISCO, INC.,<br>A CORP OF NE,NEBRASKA<br>DESCRIPTION :<br>ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:ALLINGTON,<br>ROBERT W.;<br>REEL/FRA:004597/0773<br>EFFECTIVE DATE :<br>19860828                      |
| US4781824 A | 19880830 | LSGT | PAT1  | Patented Case                                    |                                                                                                                                                                                                                              |
| US4781824 A | 19920501 | LSFE | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                      |
| US4781824 A | 19960429 | LSFE | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                      |

|             |          |      |       |                                      |                          |
|-------------|----------|------|-------|--------------------------------------|--------------------------|
| US4781824 A | 20000425 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12 |
| US4882781 A | 19891121 | LSGT | +     | granted / extensions (spc, cpc, pte) |                          |
| US4882781 A | 19910307 | LSGT | PAT1  | Patented Case                        |                          |
| US4882781 A | 19930521 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4  |
| US4882781 A | 19970519 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8  |
| US4882781 A | 20010516 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12 |
| US5040126 A | 19910813 | LSGT | +     | granted / extensions (spc, cpc, pte) |                          |
| US5040126 A | 19910613 | LSGT | PAT1  | Patented Case                        |                          |
| US5040126 A | 19950206 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4  |
| US5040126 A | 19990212 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8  |
| US5040126 A | 20030205 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12 |
| US5040126 A | 20080813 | PEXP |       | Calculated Patent Term Expiry        |                          |
| US73913 A   | 18680128 | LSGT | +     | granted / extensions (spc, cpc, pte) |                          |

**Title:** Multiple media high definition television reception system

**Abstract:** The system integrates every possible type of TV reception and has an antenna with selectable position and polarisation to allow use on boats aircraft and cars. The integrated remote **control** allows selection of the language received.

**Classifications:**

**International (IPC 8-9):** H04N5/782 H04N7/10 H04N7/14

H04N7/173 (Advanced/Invention);

H04N5/44 (Advanced/Non-invention)

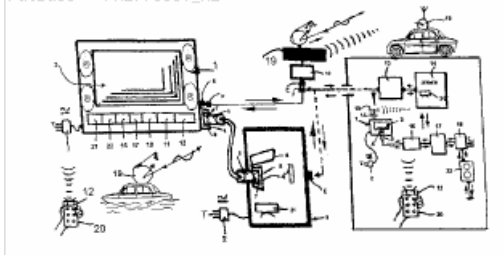
**International (IPC 1-7):** H04N5/00

**CPC:** H04N5/44 H04N5/782 H04N7/10 H04N7/147 H04N7/17309

**European:** H04N5/782 H04N7/10 H04N7/14A3 H04N7/173B

T04N5/44

PatBase - FR2775860\_A1



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| FR2775860 A1       | 19990910         | FR19980002517      | 19980303         |

**Priority:**

FR19980002517 19980303

**Probable Assignee:**

MIKRUT ANTOINE

**Assignee(s):** (std):

MIKRUT ANTOINE

**Inventor(s):** (std):

MIKRUT ANTOINE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code | Event                | Details |
|--------------|---------------|-------------|------|----------------------|---------|
| FR2775860 A1 | 19990910      | LSPB        | +    | published / reissued |         |

**Title:** HIGH DEFINITION/VERY HIGH DEFINITION SCREEN TELEVISION RECEIVER SET WITH MEMORY AND MIKROTELEC TELEVISION ENVIRONMENT SYSTEM

**Abstract:** The invention concerns assemblies consisting of colour television receiver sets designed for world intercommunication and with multiple functions and/or other audio-visual appliances equipped with high definition and/or very high definition digital and/or analog television screen with memory combined with audio-visual appliances equipped with TVCOM wave transmitters and/or receivers and with MIKROTELEC technology television environment systems designed for UNICOM. The inventive concepts and inventions are characterised in that they also include the complex MIKROTELEC technology concerning the additions or novel creations and improvements of the inventions described by Antoine MIKRUT in the French patents n 7725774 publication 2 401 589 and n 8712986 publication 2 620 888 applicable in particular in all state-of-the-art industries and fields and used in all places of recreation, residence as well as in vehicles on land, at sea and in the air. Said inventions provides the solution to problems encountered by users, in front of their (very high definition) colour television receiver set, equipped with MIKROTELEC wave-transceivers with their pre-programmed and/or programmable software in micromodules or microcomputers with remote **control** functions, and also equipped with television environment multipin connections connected to the audio-visual appliances themselves provided with MIKROTELEC wave-transceivers...

**Classifications:**

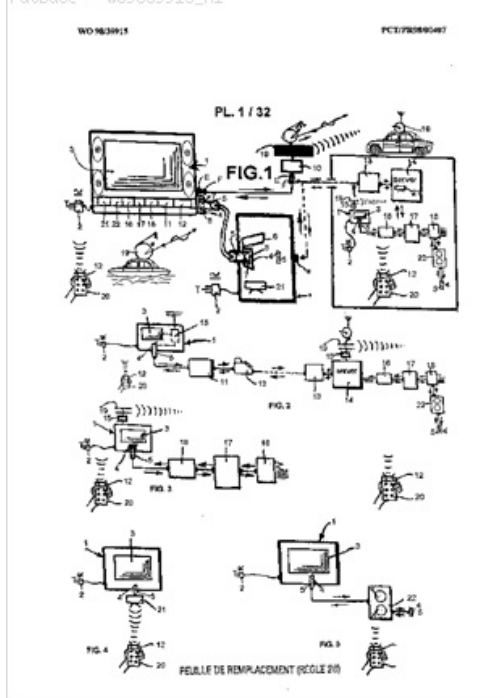
**International (ipc 8-9):** H04N11/18 H04N5/44 (Advanced/Invention); H04N11/18 (Advanced/Non-invention)

**International (ipc 1-7):** H04N5/00 H04N5/222 H04N5/44 H04N7/00 H04N9/64

**CPC:** H04N5/44 H04N11/18

**European:** H04N5/44 T04N11/18

PatBase - WO9839915\_R1



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU199868373 A1     | 19980922         | AU19980068373      | 19980302         |
| EP1042911 A1       | 20001011         | EP19980913809      | 19980302         |
| FR2760306 A1       | 19980904         | FR19970002484      | 19970303         |
| FR2760306 B1       | 20030711         | FR19970002484      | 19970303         |
| WO9839915 A1       | 19980911         | WO1998FR00407      | 19980302         |

**Priority:**

FR19970002484 19970303 WO1998FR00407 19980302

**Probable Assignee:** MIKRUT ANTOINE

**Assignee(s):** (std): MIKRUT ANTOINE

**Assignee(s):** ANTOINE MIKRUT

**Inventor(s):** (std): MIKRUT ANTOINE

**Inventor(s):** ANTOINE MIKRUT

**Designated states:** AL AM AT AU AZ BA BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CU CZ DE DK EE ES FI FR GA GB GE GH GM GN GR GW HU ID IE IL IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT UA UG US UZ VN YU ZW

**Legal status (INPADOC)**

View legal status timeline

| Patent       | Date recorded | Event group | Code | Event                         | Details                   |
|--------------|---------------|-------------|------|-------------------------------|---------------------------|
| EP1042911 A1 | 20001011      | LSPB        | +    | published / reissued          |                           |
| EP1042911 A1 | 20001011      | LSES        | +17P | REQUEST FOR EXAMINATION FILED | EFFECTIVE DATE : 19991223 |
| EP1042911 A1 | 20020206      | LSES        | +17Q | FIRST EXAMINATION REPORT      | EFFECTIVE DATE : 20011221 |
| EP1042911 A1 | 20030416      | LSDW        | -18D | DEEMED TO BE WITHDRAWN        | EFFECTIVE DATE :          |

|              |          |      |      |                                                      |                                                                                                           |
|--------------|----------|------|------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| 20021001     |          |      |      |                                                      |                                                                                                           |
| FR2760306 A1 | 19980904 | LSPB | +    | published / reissued                                 |                                                                                                           |
| FR2760306 A1 | 20081219 | LSLE | -ST  | NOTIFICATION OF LAPSE                                | EFFECTIVE DATE :<br>20081125                                                                              |
| FR2760306 B1 | 20030711 | LSGT | +    | granted / extensions (spc, cpc,<br>pte)              |                                                                                                           |
| FR2760306 B1 | 20170303 | PEXP |      | Calculated Patent Term Expiry                        |                                                                                                           |
| WO9839915 A1 | 19980911 | LSPB | +    | published / reissued                                 |                                                                                                           |
| WO9839915 A1 | 19991223 | LSNP | +WWE | WIPO INFORMATION: ENTRY<br>INTO NATIONAL PHASE       | REF DOCUMENT<br>NUMBER :<br>1998913809<br>COUNTRY OF REF<br>DOCUMENT : EP                                 |
| WO9839915 A1 | 20000105 | LSWD | REG  | REFERENCE TO NATIONAL CODE                           | REF COUNTRY CODE :<br>DE<br>REF LEGAL EVENT<br>CODE : 8642                                                |
| WO9839915 A1 | 20000303 | LSNE | NENP | NON-ENTRY INTO THE NATIONAL<br>PHASE IN:             | REF COUNTRY CODE :<br>JP<br>REF DOCUMENT<br>NUMBER :<br>1998538227<br>FORMAT OF REF<br>DOCUMENT (F/P) : F |
| WO9839915 A1 | 20000903 | LSNE | NENP | NON-ENTRY INTO THE NATIONAL<br>PHASE IN:             | REF COUNTRY CODE :<br>CA                                                                                  |
| WO9839915 A1 | 20001011 | LSPB | +WWP | WIPO INFORMATION: PUBLISHED<br>IN NATIONAL OFFICE    | REF DOCUMENT<br>NUMBER :<br>1998913809<br>COUNTRY OF REF<br>DOCUMENT : EP                                 |
| WO9839915 A1 | 20021001 | LSWD | -WWW | WIPO INFORMATION:<br>WITHDRAWN IN NATIONAL<br>OFFICE | REF DOCUMENT<br>NUMBER :<br>1998913809<br>COUNTRY OF REF<br>DOCUMENT : EP                                 |

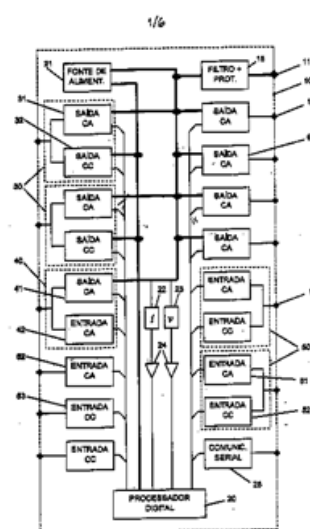
**Title:** **controlador** e protetor eletrênico para equipamentos de refrigeração e método de realização do mesmo **Controller** and eletrênico protector for refrigeration equipment and realization of the same method (Machine translation)

**Abstract:** Source: BRPI0705268A 3 09-06268-5 Resumo "**CONTROLADOR** E PROTETOR ELETRÔNICO PARA EQUIPAMENTOS DE REFRIGERAÇÃO E MÉTODO DE REALIZAÇÃO DO MESMO", compreendendo: uma placa de circuito impresso (10) 5 contendo pelo menos um filtro de linha (15), que faz interface com a rede elétrica e limita a interferência eletromagnética; um dispositivo eletrônico do tipo processador digital (20), que pode ser implementado por uma multiplicidade de pcoes, todas elas disponíveis J.O comercialmente, o qual permite executar um programa de **controle**; uma fonte de alimentação (21); um circuito de medição de corrente alternada (22), que pode ser implementado por uma multiplicidade de sensores; um circuito de medição de tensão alternada (23); circuitos 15 analógicos de condicionamento das medidas de corrente e tensão alternada (24); um circuito eletrônico para comunicação serial (25), que permite uma multiplicidade de formas de comunicação; um sistema de interface (11), (12) e (13), implementado por uma multiplicidade de 20 conectores elétricos, que permite conectar o sistema de **controle** objeto da presente invenção ao equipamento de refrigeração. Em um aspecto adicional, a presente invenção consiste em um sistema de **controle** que compreende uma pluralidade de circuitos de interface 25 (30), (40), (50), (61), (62) e (63), configuráveis, que permitem interconectar o referido sistema com outros circuitos ou dispositivos do equipamento de refrigeração. /3 Em um aspecto adicional, a presente invenção consiste em um programa de **controle** do equipamento de refrigeração que é executado pelo processador digital (20), o qual **controla** o funcionamento da presente invenção. Este 5 programa de **controle** (100) compreende pelo menos, mas não limitado a estes: um algoritmo de aplicação do cliente (110), um algoritmo de medição de grandezas elétricas (120); um algoritmo de redução do consumo de energia elétrica (140); um algoritmo de **controle** da temperatura 10 do gabinete (150); um algoritmo de **controle** de partida e parada do compressor hermetico (160); um algoritmo de **controle** de degelo (170); um algoritmo de **controle** do(s) ventilador(es) (180); um algoritmo de monitoramento da porta do gabinete (190); um algoritmo de **controle** de 15 válvula(s) (200); um algoritmo de **controle** de resistência de "anti-condensação" (210); um algoritmo de **controle** da iluminação do gabinete (220); um algoritmo de comunicação serial (230); algoritmo de proteção mecânica e térmica (240); algoritmos de proteções elétricas, tais como: sub 20 e sobre tensão, sub e sobre frequência, sub e sobre corrente, sobre carga do motor do compressor, rotor travado do motor do compressor (250). Finalmente, em um aspecto adicional, a presente invenção propõe um **controlador** para sistemas de refrigeração baseado em um 25 conceito de plataforma de "hardware" e "software", ou sejam, circuitos eletrônicos e programas especialmente desenvolvidos, de forma a permitirem diferentes f 3/3 configurações dependendo da aplicação final. Esta flexibilidade implica em várias vantagens competitivas para o referido **controlador**. 3 09-06268-5 summary "**CONTROLLER** AND SHIELD FOR **ELECTRONIC** REFRIGERATION EQUIPMENT AND EVEN THE method of achieving", comprising: a printed circuit board (10) 5 containing at least one strip (15), which interfaces with the power grid and restricts electromagnetic interference; An **electronic** device of the type digital processor (20), which can be implemented by a plurality of the PTIONS, all commercially available J.O, which allows executing a **control** program; one power unit (21); an alternating current measuring circuit (22), which can be implemented by a plurality of sensors; an alternating voltage measurement circuit (23); Analog conditioning circuitry 15 measures the current and alternating voltage (24); an **electronic** circuit for serial communication (25), which allows a multiplicity of forms of communication; an interface system (11), (12) and (13) implemented by a plurality of electrical connectors 20, allowing to connect the **control** system object of the invention to refrigeration equipment. In a further aspect, the present invention consists in a **control** system comprising a plurality of interface circuits 25 (30), (40), (50), (61), (62) and (63), configurable that allow interconnect this system with other circuits or refrigeration equipment devices. / 3 In an additional aspect, the present invention consists of a **control** program cooling equipment and executed by the digital processor (20), which **controls** the operation of the present invention. This 5-**control** program (100) comprises at least, but not limited to these: a client application algorithm (110), one medication algorithm eletricas quantities (120); one reduction algorithm of electric power consumption (140); a temperature **control** algorithm 10 cabinet (150); a starting **control** algorithm and stop the hermetic compressor (160); a thaw **control** algorithm (170); a **control** algorithm (s) of fan (s) (180); a tracking algorithm enclosure door (190); 15 a **valve control** algorithm (s) (200); one resistance **control** algorithm of "anti-condensation" (210); a **control** algorithm of lighting of the cabinet (220); serial communication algorithm one (230); protection algorithm mechanical and thermal (240); algorithms eletricas protections, such as: sub 20 and over voltage, under and over frequency, under and over current, over compressor motor load, locked rotor compressor motor (250). Finally, in a further aspect, the present invention proposes a **controller** for refrigeration systems based on a 25-concept platform "hardware" and "software", that is, **electronic** circuits and specially developed programs in order to allow different f3 / 3 configurations depending on the end application. This flexibility implies several competitive advantages to said **controller**.

#### Classifications:

**International (IPC 8-9):** F25D29/00 G05D23/20 (Advanced/Invention); F25D29/00 G05D23/20 (Core/Invention)

PatBase - BRPI0705268\_A2



#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| BRPI0705268 A2     | 20100511         | BR2007PI05268      | 20071203         |

#### Priority:

BR2007PI05268 20071203

**Probable Assignee:** TECUMSEH DO BRASIL LTDA  
**Assignee(s):** (std): TECUMSEH DO BRASIL LTDA  
**Inventor(s):** (std): BOTEGA MARIO LUIS JR  
**Inventor(s):** MARIO LUIS BOTEGA JR

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent         | Date recorded | Event group | Code  | Event                                                                                                                    | Details                                  |
|----------------|---------------|-------------|-------|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| BRPI0705268 A2 | 20100511      | LSPB        | +     | published / reissued                                                                                                     |                                          |
| BRPI0705268 A2 | 20100511      | LSPB        | B03A  | PUBLICATION OF AN APPLICATION:<br>PUBLICATION OF A PATENT APPLICATION<br>OR OF A CERTIFICATE OF ADDITION OF<br>INVENTION |                                          |
| BRPI0705268 A2 | 20161011      | LSFE        | -B08F | APPLICATION FEES: DISMISSAL - ARTICLE<br>86 OF INDUSTRIAL PROPERTY LAW                                                   | TEXT :<br>REFERENTE<br>A 9A<br>ANUIDADE. |
| BRPI0705268 A2 | 20170207      | LSLE        | -B08K | LAPSE AS NO EVIDENCE OF PAYMENT OF THE<br>ANNUAL FEE HAS BEEN FURNISHED TO INPI<br>(ACC. ART. 87)                        |                                          |

**Title:** METHOD, SYSTEM AND COMPUTER PROGRAM PRODUCT FOR PRODUCING RENEWABLE ELECTRICAL POWER

**Abstract:** Source: US2010186400A A system, method and computer program product for producing renewable electrical power energy which does not require the consumption of fossil-based, petroleum-based or other combustible fuels, nor release hazardous emissions or byproducts to the atmosphere or otherwise to the environment. The system utilizes closed-loop fluid recirculation and is not dependent upon an external unlimited sources of water flow and head as with dam-style hydro-electric power systems and is not dependant upon predefined favorable environmental and/or weather conditions to function. The system includes a DC magnetic system adapted to be coupled between an AC generator and a hydro-rotor/centrifugal pump system; a DC power source and charging system; a propulsion pump system; and a containment housing with a plurality of thrust producing vanes, fluid management infrastructure and reservoir. The hydro-rotor/centrifugal pump system utilizes thermal energy, kinetic energy, fluid dynamics, mass inertia and centrifugal forces to drive an AC electrical generator, and the DC magnetic system serves to both initiate the system and regulate the electrical output of the generator.

**Classifications:**

**International (IPC 8-9):** F03B13/00 F03G7/00 (Advanced/Invention);

F03B17/04 (Advanced/Non-invention);

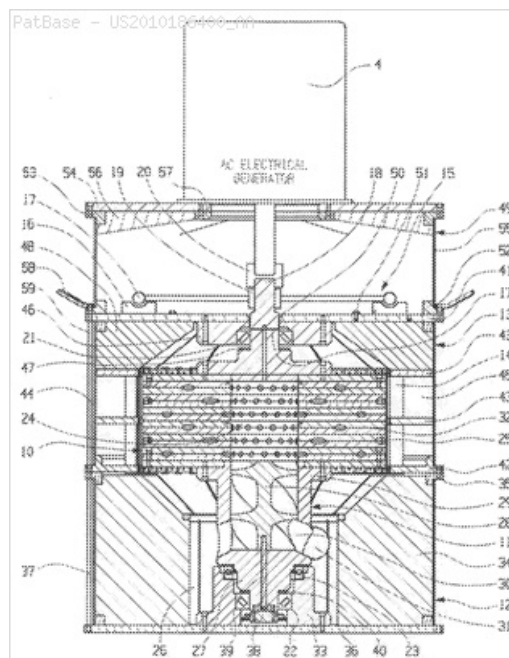
F03G7/00 (Core/Invention);

F03B17/00 (Core/Non-invention)

**CPC:** F03G7/10

**European:** F03G7/10

**US:** 415/916 415/916S 60/325 60/325P



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2010186400 AA    | 20100729         | US20090592148      | 20091119         |
| WO10085233 A1      | 20100729         | WO2009US06191      | 20091119         |

**Priority:**

US20090205936P 20090126      US20090592148 20091119

**Probable Assignee:** UNITED HYDRO TECHNOLOGIES CORP

**Assignee(s):** (std): MITCHELL RICHARD A ; PRESTON ROBERT B ; UNITED HYDRO TECHNOLOGIES CORP

**Inventor(s):** (std): MITCHELL RICHARD A ; PRESTON ROBERT B

**Agent(s):** RICHARD A MITCHELL ESQ BEACON IND INC; MITCHELL RICHARD A ET AL

**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code | Event                | Details                                                                                                                                                                                                                          |
|-----------------|---------------|-------------|------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2010186400 AA | 20100729      | LSPB        | +    | published / reissued |                                                                                                                                                                                                                                  |
| US2010186400 AA | 20091119      | LSAS        | AS   | ASSIGNMENT           | OWNER NAME : UNITED HYDRO TECHNOLOGIES CORPORATION, CONNECTICUT<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:PRESTON, ROBERT B.; MITCHELL, RICHARD A.;<br>REEL/FRAME:023589/0908<br>EFFECTIVE DATE : 20091111 |
| US2010186400 AA | 20091119      | LSAS        | AS   | ASSIGNMENT           | OWNER NAME : UNITED HYDRO TECHNOLOGIES CORPORATION,CONNECTICUT<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:PRESTON, ROBERT B.; MITCHELL, RICHARD A.;                                                         |

|                 |          |      |       |                                                                 |                                                                                                  |
|-----------------|----------|------|-------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| US2010186400 AA | 20130509 | LSWD | -ABD3 | Abandoned --<br>Failure to<br>Respond to<br>an Office<br>Action |                                                                                                  |
| WO10085233 A1   | 20100729 | LSPB | +     | published /<br>reissued                                         |                                                                                                  |
| WO10085233 A1   | 20110726 | LSNE | NENP  | NON-ENTRY<br>INTO THE<br>NATIONAL<br>PHASE IN:                  | REF COUNTRY CODE : DE                                                                            |
| WO10085233 A1   | 20120321 | LSNE | -122  | EP: PCT<br>APPLICATION<br>NON-ENTRY IN<br>EUROPEAN<br>PHASE     | REF DOCUMENT NUMBER : 09838985<br>COUNTRY OF REF DOCUMENT : EP<br>KIND CODE OF REF DOCUMENT : A1 |

**Title:** PRESSURE REGULATOR MODULE FOR A MOTOR VEHICLE PNEUMATIC BRAKING SYSTEM

**Abstract:** Source: US2006152075A The invention concerns a pressure regulator module for a motor vehicle pneumatic braking system, in particular a utility vehicle. The pressure regulator module is used to **control** or regulate on the basis of the wheel slip braking pressure applied on two separate working connections and comprises a **two-way valve** assembly consisting of a relay **valve** for each conduit. The invention is characterized in that, only one pressure regulating **valve** in the form of a 3/2-way **valve** is assigned to the **control** inputs of each of the relay **valves**, thus providing a pressure regulating **valve** easy and economical to manufacture.

**Classifications:**

**International (IPC 8-9):** B60T13/68 B60T8/24 B60T8/32 B60T8/34 B60T8/36 B60T8/46 B60T8/48 B60T8/50 (Advanced/Invention);

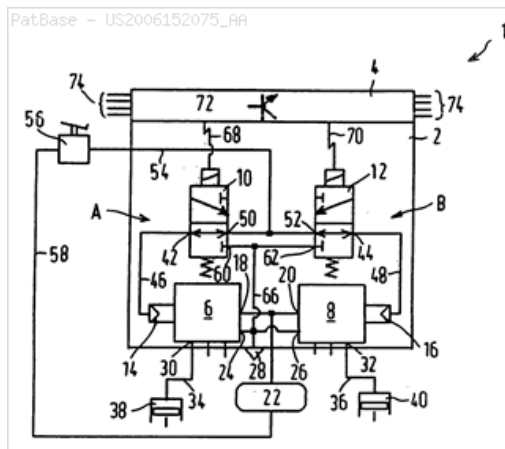
B60T13/68 B60T8/24 B60T8/32 B60T8/34 B60T8/36 B60T8/48 (Core/Invention)

**International (IPC 1-7):** B60T13/66 B60T13/68 B60T8/32 B60T8/36 B60T8/38 B60T8/46

**CPC:** B60T8/327 B60T8/343 B60T8/361 B60T8/4818 B60T8/5006 B60T13/683

**European:** B60T13/68B B60T8/32D14B B60T8/34D B60T8/36D B60T8/48B2 B60T8/50B

**US:** 303/119.1 303/119.100P 303/15 303/15S 303/3 303/3S



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT362860 E         | 20070615         | AT20030793717T     | 20030811         |
| AU2003251703 AA    | 20040329         | AU20030251703      | 20030811         |
| CA2495613 AA       | 20050209         | CA20032495613      | 20030811         |
| DE10236922 A1      | 20040304         | DE20021036922      | 20020812         |
| DE50307336 D1      | 20070705         | DE20035007336      | 20030811         |
| EP1530529 A1       | 20050518         | EP20030793717      | 20030811         |
| EP1530529 B1       | 20070523         | EP20030793717      | 20030811         |
| JP2005538882 T2    | 20051222         | JP20040533355T     | 20030811         |
| JP4763288 B2       | 20110831         | JP20040533355      | 20030811         |
| MXPA05001762 A1    | 20050819         | MX2005PA01762      | 20030811         |
| US2006152075 AA    | 20060713         | US20050524291      | 20050922         |
| WO04022397 A1      | 20040318         | WO2003EP08884      | 20030811         |

**Priority:**

DE20021036922 20020812 DE20035007336 20030811 WO2003EP08884 20030811

**Probable Assignee:** KNORR BREMSE SYSTEME F NUTZFAHRZEUGE GMBH

**Assignee(s):** (std): BEYER RICHARD E ; GOEBELS HERMANN ; KNORR BREMSE SYSTEME

**Assignee(s):** KNORR BREMSE SYSTEME F ; KNORR BREMSE SYSTEME F NUTZFAHRZEUGE GMBH ; KNORR BREMSE SYSTEME FUER NUTZFAHRZEUGE GMBH ; KNORR BREMSE SYSTEME FUR NUTZFAHRZEUGE GMBH

**Inventor(s):** (std): BEYER RICHARD ; BEYER RICHARD E ; GOEBELS HERMANN ; RICHARD E BEYER ; HERMANN GOEBELS

**Agent(s):** FETHERSTONHAUGH AND CO; CROWELL AND MORING LLP, INTELLECTUAL PROPERTY GROUP; CROWELL AND MORING LLP INTELLECTUAL PROPERTY GROUP

**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code | Event                                                                                      | Details |
|-----------------|---------------|-------------|------|--------------------------------------------------------------------------------------------|---------|
| AT362860 E      | 20070615      | LSGT        | +    | granted / extensions (spc, cpc, pte)                                                       |         |
| AT362860 E      | 20081115      | LSLE        | -REN | CEASED DUE TO NON-PAYMENT OF THE ANNUAL FEE                                                |         |
| AT362860 E      | 20230811      | PEXP        |      | Calculated Patent Term Expiry                                                              |         |
| AU2003251703 AA | 20050428      | LSLE        | -MK6 | APPLICATION LAPSED SECTION 142(2)(F)/REG. 8.3(3) - PCT APPLIC. NOT ENTERING NATIONAL PHASE |         |
| CA2495613 AA    | 20050209      | LSPB        | +    | published / reissued                                                                       |         |

|               |          |       |       |                                                                                       |                                                                                                                                                                                                          |
|---------------|----------|-------|-------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CA2495613 AA  | 20050209 | LSNP  | +AFNE | NATIONAL PHASE ENTRY                                                                  |                                                                                                                                                                                                          |
| CA2495613 AA  | 20080417 | LSSES | +EEER | EXAMINATION REQUEST                                                                   |                                                                                                                                                                                                          |
| CA2495613 AA  | 20110714 | LSLE  | -FZDE | DEAD                                                                                  |                                                                                                                                                                                                          |
| CA2495613 AA  | 20111006 | LSLE  | -FZDE | DEAD                                                                                  | EFFECTIVE DATE : 20110714                                                                                                                                                                                |
| DE10236922 A1 | 20040304 | LSPB  | +     | published / reissued                                                                  |                                                                                                                                                                                                          |
| DE10236922 A1 | 20040304 | LSSES | +OP8  | REQUEST FOR EXAMINATION AS TO PARAGRAPH 44 PATENT LAW                                 |                                                                                                                                                                                                          |
| DE10236922 A1 | 20081106 | LSRV  | -8131 | REJECTION                                                                             |                                                                                                                                                                                                          |
| DE50307336 D1 | 20080612 | LSGT  | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                               |                                                                                                                                                                                                          |
| EP1530529 A1  | 20050518 | LSPB  | +     | published / reissued                                                                  |                                                                                                                                                                                                          |
| EP1530529 A1  | 20050518 | LSSES | +17P  | REQUEST FOR EXAMINATION FILED                                                         | EFFECTIVE DATE : 20050314                                                                                                                                                                                |
| EP1530529 A1  | 20050713 | LSSES | +17Q  | FIRST EXAMINATION REPORT                                                              | EFFECTIVE DATE : 20050527                                                                                                                                                                                |
| EP1530529 A1  | 20161031 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20160823<br>YEAR OF FEE PAYMENT : 14                                                                                                                      |
| EP1530529 A1  | 20161130 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20160825<br>YEAR OF FEE PAYMENT : 14                                                                                                                      |
| EP1530529 B1  | 20070523 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                          |
| EP1530529 B1  | 20070523 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : FI<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070523 |
| EP1530529 B1  | 20070523 | LSGT  | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D<br>TEXT : NOT ENGLISH                                                                                                                               |
| EP1530529 B1  | 20070615 | LSNP  | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                                                                                                                                       |
| EP1530529 B1  | 20070627 | LSGT  | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : FG4D<br>TEXT : LANGUAGE OF EP DOCUMENT: GERMAN                                                                                                           |
| EP1530529 B1  | 20070903 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : ES<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070903 |
| EP1530529 B1  | 20071221 | LSWD  | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : FD4D                                                                                                                                                     |
| EP1530529 B1  | 20080131 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : BG<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070823 |
| EP1530529 B1  | 20080131 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : CZ<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070523 |

|              |          |      |       |                                                                                       |                                                                                                                                                                                                                         |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1530529 B1 | 20080131 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : DK<br>NOTIFICATIONOF LAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE FEE<br>WITHIN THE PRESCRIBED TIME-<br>LIMIT<br>LAPSED DATE : 20070523 |
| EP1530529 B1 | 20080131 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : IE<br>NOTIFICATIONOF LAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE FEE<br>WITHIN THE PRESCRIBED TIME-<br>LIMIT<br>LAPSED DATE : 20070523 |
| EP1530529 B1 | 20080131 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : PT<br>NOTIFICATIONOF LAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE FEE<br>WITHIN THE PRESCRIBED TIME-<br>LIMIT<br>LAPSED DATE : 20071023 |
| EP1530529 B1 | 20080131 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : SI<br>NOTIFICATIONOF LAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE FEE<br>WITHIN THE PRESCRIBED TIME-<br>LIMIT<br>LAPSED DATE : 20070523 |
| EP1530529 B1 | 20080229 | LSLE | -BERE | BE: LAPSED                                                                            | PARTYTYPE : OWNER<br>REF COUNTRY CODE : EP<br>OWNER : KNORR-BREMSE<br>SYSTEME FUR NUTZFAHRZEUGE<br>G.M.B.H.<br>EFFECTIVE DATE : 20070831                                                                                |
| EP1530529 B1 | 20080229 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : SK<br>NOTIFICATIONOF LAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE FEE<br>WITHIN THE PRESCRIBED TIME-<br>LIMIT<br>LAPSED DATE : 20070523 |
| EP1530529 B1 | 20080415 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                                                      |
| EP1530529 B1 | 20080430 | LSGT | +26N  | NO OPPOSITION FILED                                                                   | EFFECTIVE DATE : 20080226                                                                                                                                                                                               |
| EP1530529 B1 | 20080430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : CH<br>NOTIFICATIONOF LAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF<br>DUE FEES<br>LAPSED DATE : 20070831                                                                                         |
| EP1530529 B1 | 20080430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : GR<br>NOTIFICATIONOF LAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE FEE<br>WITHIN THE PRESCRIBED TIME-<br>LIMIT<br>LAPSED DATE : 20070824 |
| EP1530529 B1 | 20080430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : LI<br>NOTIFICATIONOF LAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF<br>DUE FEES<br>LAPSED DATE : 20070831                                                                                         |
| EP1530529 B1 | 20080430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : MC<br>NOTIFICATIONOF LAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF<br>DUE FEES<br>LAPSED DATE : 20070831                                                                                         |
| EP1530529 B1 | 20080530 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM                    | COUNTRY OF REF DOCUMENT : RO<br>NOTIFICATIONOF LAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE FEE<br>WITHIN THE PRESCRIBED TIME-                                    |

|              |          |      |       |                                                                                       |                                                                                                                                                                                                             |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | NAT. OFFICE TO EPO                                                                    | LIMIT<br>LAPSED DATE : 20070523                                                                                                                                                                             |
| EP1530529 B1 | 20080829 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : BE<br>NOTIFICATION OF LAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20070831                                                                               |
| EP1530529 B1 | 20081128 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : AT<br>NOTIFICATION OF LAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20070811                                                                               |
| EP1530529 B1 | 20090130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : EE<br>NOTIFICATION OF LAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070523 |
| EP1530529 B1 | 20090731 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : CY<br>NOTIFICATION OF LAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070523 |
| EP1530529 B1 | 20090831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : LU<br>NOTIFICATION OF LAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20070811                                                                               |
| EP1530529 B1 | 20090930 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : HU<br>NOTIFICATION OF LAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20071124 |
| EP1530529 B1 | 20090930 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : TR<br>NOTIFICATION OF LAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070523 |
| EP1530529 B1 | 20131031 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : NL<br>PAYMENT DATE : 20130822<br>YEAR OF FEE PAYMENT : 11                                                                                                                         |
| EP1530529 B1 | 20131129 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20130823<br>YEAR OF FEE PAYMENT : 11                                                                                                                         |
| EP1530529 B1 | 20150318 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : NL<br>REF LEGAL EVENT CODE : V1<br>EFFECTIVE DATE : 20150301                                                                                                                             |
| EP1530529 B1 | 20150429 | LSLE | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                         | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20140811                                                                                                                                                          |
| EP1530529 B1 | 20150430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : NL<br>NOTIFICATION OF LAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20150301                                                                               |
| EP1530529 B1 | 20150731 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : GB<br>NOTIFICATION OF LAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20140811                                                                               |

|                 |          |      |       |                                                                                                            |                                                                                                                                  |
|-----------------|----------|------|-------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| EP1530529 B1    | 20151030 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES PAID<br>TO NATIONAL<br>OFFICE                                                    | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20150820<br>YEAR OF FEE PAYMENT : 13                                              |
| EP1530529 B1    | 20160825 | LSFE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                            | COUNTRY OF REF DOCUMENT : FR<br>REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 14                 |
| EP1530529 B1    | 20161130 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES PAID<br>TO NATIONAL<br>OFFICE                                                    | COUNTRY OF REF DOCUMENT : SE<br>PAYMENT DATE : 20160823<br>YEAR OF FEE PAYMENT : 14                                              |
| EP1530529 B1    | 20170301 | LSDW | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                            | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R119<br>REF DOCUMENT NUMBER :<br>50307336<br>COUNTRY OF REF DOCUMENT : DE        |
| EP1530529 B1    | 20170731 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT : DE<br>NOTIFICATION OF LAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF<br>DUE FEES<br>LAPSED DATE : 20170301 |
| EP1530529 B1    | 20170823 | LSFE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                            | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 15                                                 |
| EP1530529 B1    | 20171031 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES PAID<br>TO NATIONAL<br>OFFICE                                                    | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20170823<br>YEAR OF FEE PAYMENT : 15                                              |
| EP1530529 B1    | 20171031 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES PAID<br>TO NATIONAL<br>OFFICE                                                    | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20170824<br>YEAR OF FEE PAYMENT : 15                                              |
| EP1530529 B1    | 20230811 | PEXP |       | Calculated Patent<br>Term Expiry                                                                           |                                                                                                                                  |
| JP2005538882 T2 | 20051222 | LSPB | +     | published /<br>reissued                                                                                    |                                                                                                                                  |
| JP4763288 B2    | 20110831 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                                 |                                                                                                                                  |
| JP4763288 B2    | 20060513 | LSES | +A621 | WRITTEN<br>REQUEST FOR<br>APPLICATION<br>EXAMINATION                                                       | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20060512                                                   |
| JP4763288 B2    | 20090612 | LSES | -A131 | NOTIFICATION OF<br>REASONS FOR<br>REFUSAL                                                                  | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20090611                                                   |
| JP4763288 B2    | 20091113 | LSRE | A521  | WRITTEN<br>AMENDMENT                                                                                       | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20091112                                                   |
| JP4763288 B2    | 20110524 | LSGT | +TRDD | DECISION OF<br>GRANT OR<br>REJECTION<br>WRITTEN                                                            |                                                                                                                                  |
| JP4763288 B2    | 20110603 | LSGT | +A01  | WRITTEN<br>DECISION TO<br>GRANT A PATENT<br>OR TO GRANT A<br>REGISTRATION<br>(UTILITY MODEL)               | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A01<br>EFFECTIVE DATE : 20110602                                                    |
| JP4763288 B2    | 20110609 | LSGT | +A01  | WRITTEN<br>DECISION TO<br>GRANT A PATENT<br>OR TO GRANT A<br>REGISTRATION<br>(UTILITY MODEL)               | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A01                                                                                 |
| JP4763288 B2    | 20110616 | LSFE | +A61  | FIRST PAYMENT<br>OF ANNUAL FEES<br>(DURING GRANT<br>PROCEDURE)                                             | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20110609                                                    |
| JP4763288 B2    | 20110617 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE)                                   | DESCRIPTION : PAYMENT UNTIL:<br>20140617<br>YEAR OF FEE PAYMENT : 3                                                              |
| JP4763288 B2    | 20110617 | LSGT | +R150 | CERTIFICATE OF<br>PATENT OR<br>REGISTRATION<br>OF UTILITY<br>MODEL                                         | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: R150                                                                                |

|                 |          |      |       |                                                     |                                                                                                                                                                                                                                            |
|-----------------|----------|------|-------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP4763288 B2    | 20150623 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                              | DESCRIPTION : JAPANESE INTERMEDIATE CODE: R250                                                                                                                                                                                             |
| JP4763288 B2    | 20230811 | PEXP |       | Calculated Patent Term Expiry                       |                                                                                                                                                                                                                                            |
| MXPA05001762 A1 | 20050819 | LSPB | +     | published / reissued                                |                                                                                                                                                                                                                                            |
| MXPA05001762 A1 | 20080815 | LSGT | +FG   | GRANT OR REGISTRATION                               |                                                                                                                                                                                                                                            |
| US2006152075 AA | 20060713 | LSPB | +     | published / reissued                                |                                                                                                                                                                                                                                            |
| US2006152075 AA | 20050922 | LSAS | AS    | ASSIGNMENT                                          | OWNER NAME : KNORR-BREMSE SYSTEME FUER NUTZFAHRZEUGE GMBH, GERM<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:GOEBELS, HERMANN;<br>BEYER, RICHARD;<br>REEL/FRAME:017014/0073;<br>SIGNING DATES FROM 20050829 TO 20050831 |
| US2006152075 AA | 20100118 | LSWD | -ABD3 | Abandoned -- Failure to Respond to an Office Action |                                                                                                                                                                                                                                            |
| WO04022397 A1   | 20040318 | LSPB | +     | published / reissued                                |                                                                                                                                                                                                                                            |
| WO04022397 A1   | 20050124 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE         | REF DOCUMENT NUMBER : 2003793717<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                                           |
| WO04022397 A1   | 20050209 | LSNP | ENP   | ENTRY INTO THE NATIONAL PHASE IN:                   | REF DOCUMENT NUMBER : 2495613<br>COUNTRY OF REF DOCUMENT : CA                                                                                                                                                                              |
| WO04022397 A1   | 20050210 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE         | REF DOCUMENT NUMBER : 2004533355<br>COUNTRY OF REF DOCUMENT : JP                                                                                                                                                                           |
| WO04022397 A1   | 20050211 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE         | REF DOCUMENT NUMBER : PA/A/2005/001762<br>COUNTRY OF REF DOCUMENT : MX                                                                                                                                                                     |
| WO04022397 A1   | 20050518 | LSPB | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE      | REF DOCUMENT NUMBER : 2003793717<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                                           |
| WO04022397 A1   | 20050922 | LSNP | ENP   | ENTRY INTO THE NATIONAL PHASE IN:                   | REF DOCUMENT NUMBER : 2006152075<br>COUNTRY OF REF DOCUMENT : US<br>KIND CODE OF REF DOCUMENT : A1                                                                                                                                         |
| WO04022397 A1   | 20050922 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE         | REF DOCUMENT NUMBER : 10524291<br>COUNTRY OF REF DOCUMENT : US                                                                                                                                                                             |
| WO04022397 A1   | 20060713 | LSPB | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE      | REF DOCUMENT NUMBER : 10524291<br>COUNTRY OF REF DOCUMENT : US                                                                                                                                                                             |
| WO04022397 A1   | 20070523 | LSGT | +WWG  | WIPO INFORMATION: GRANT IN NATIONAL OFFICE          | REF DOCUMENT NUMBER : 2003793717<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                                           |

**Title:** Device for anti-lock **control** and for thrust **control** on a motor vehicle with all-wheel drive

**Abstract:** Source: US4741581A In a motor vehicle with an all-wheel drive, which is equipped with a thrust and anti-lock **control** device, each wheel brake has assigned to it a pressure modulator, within which a **control**-pressure space, into which the outlet pressure of a brake unit can be fed, and an outlet-pressure space, to which a particular wheel brake is connected, are limited by a **control** piston. This **control** piston ensures the hydraulic separation of the **control** circuit from the outlet circuit. Two drive pistons supported on the **control** piston limit, within the modulator **housing**, two drive-pressure spaces which, by being connected alternately to the outlet of an operating-pressure source, can **control** pressure build-up and pressure-reduction **control** movements of the **control** piston. To **control** the connection of the drive-pressure spaces to this operating-pressure source, there are **two-way** solenoid **valves** which can be activated by means of output signals from an **electronic control** unit provided jointly for the anti-lock **control** and the thrust **control**.

**Classifications:**

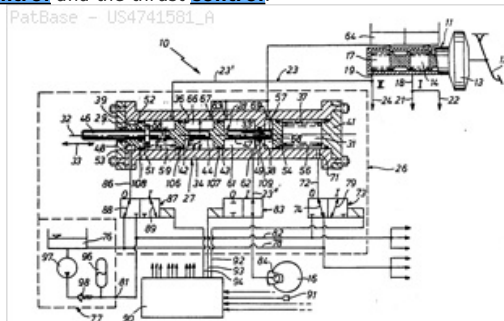
**International (IPC 8-9):** B60T8/175 B60T8/40 (Advanced/Invention)

**International (IPC 1-7):** B60K28/16 B60T13/68 B60T8/34 B60T8/40 B60T8/42 B60T8/48 B60T8/58

**CPC:** B60T8/322 B60T8/4233 B60T8/4863

**European:** B60T8/32D4 B60T8/42A4A B60T8/48B4D

**US:** 180/197 303/113.2 303/115 303/119



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE3531157 C1       | 19870312         | DE19853531157      | 19850831         |
| GB2180606 A1       | 19870401         | GB19860020910      | 19860829         |
| GB2180606 B2       | 19890809         | GB19860020910      | 19860829         |
| GB8620910 A0       | 19861008         | GB19860020910      | 19860829         |
| JP1707282 C3       | 19921027         | JP19860200252      | 19860828         |
| JP3065303 B4       | 19911011         | JP19860200252      | 19860828         |
| JP62053275 A2      | 19870307         | JP19860200252      | 19860828         |
| US4741581 A        | 19880503         | US19860902682      | 19860902         |

**Priority:**

DE19853531157 19850831

**Probable Assignee:** DAIMLER BENZ AG

**Assignee(s):** (std): DAIMLER BENZ AG

**Assignee(s):** DAIMLER BENZ AG 7000 STUTTGART DE ; DAIMLER BENZ AKTIENGESellschaft ; DAIMLER BENZ AKTIENGESellschaft

**Inventor(s):** (std): HERUMUUTO KUROON ; KROHN HELLMUT

**Inventor(s):** KROHN HELLMUT 7300 ESSLINGEN DE ; HELLMUT KROHN

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                                                                 | Details                   |
|--------------|---------------|-------------|-------|---------------------------------------------------------------------------------------|---------------------------|
| DE3531157 C1 | 19870312      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                  |                           |
| DE3531157 C1 | 19870312      | LSPB        | +8100 | PUBLICATION OF THE EXAMINED APPLICATION WITHOUT PUBLICATION OF UNEXAMINED APPLICATION |                           |
| DE3531157 C1 | 19870312      | LSGT        | +D1   | GRANT (NO UNEXAMINED APPLICATION PUBLISHED) PATENT LAW 81                             |                           |
| DE3531157 C1 | 19870910      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                               |                           |
| GB2180606 A1 | 19870401      | LSPB        | +     | published / reissued                                                                  |                           |
| GB2180606 A1 | 19930428      | LSLE        | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                                      | EFFECTIVE DATE : 19920829 |
| GB2180606 B2 | 19890809      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                  |                           |
| GB2180606 B2 | 20060829      | PEXP        |       | Calculated Patent Term Expiry                                                         |                           |
| JP1707282 C3 | 19921027      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                  |                           |
| JP1707282 C3 | 20060828      | PEXP        |       | Calculated Patent Term Expiry                                                         |                           |
| JP3065303 B4 | 19911011      | LSPB        | +     | published / reissued                                                                  |                           |

|               |          |      |       |                                               |                                                                                                                                                                                                        |
|---------------|----------|------|-------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP62053275 A2 | 19870307 | LSPB | +     | published / reissued                          |                                                                                                                                                                                                        |
| US4741581 A   | 19880503 | LSGT | +     | granted / extensions (spc, cpc, pte)          |                                                                                                                                                                                                        |
| US4741581 A   | 19861009 | LSAS | AS    | ASSIGNMENT                                    | OWNER NAME : DAIMLER-BENZ AKTIENGESELLSCHAFT, D 700 STUTTGART 6<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.;<br>ASSIGNOR:KROHN, HELLMUT;<br>REEL/FRAME:004622/0139<br>EFFECTIVE DATE : 19860828 |
| US4741581 A   | 19880307 | LSGT | PAT1  | Patented Case                                 |                                                                                                                                                                                                        |
| US4741581 A   | 19910930 | LSFE | +FPAY | FEE PAYMENT                                   | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                |
| US4741581 A   | 19960505 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES     |                                                                                                                                                                                                        |
| US4741581 A   | 19960716 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE | EFFECTIVE DATE : 19960508                                                                                                                                                                              |

**Title:** Improved apparatus suitable for **controlling** the relationship between continuously travelling elements and devices periodically co-operating therewith

**Abstract:** Source: GB743112A 743,112. Cutting paper tubes. ROBINSON, E. B. March 25, 1952 [Nov. 3, 1950; Feb. 13, 1951], Nos. 26936/50 and 3435/51. Class 31 (1). [Also in Groups XXVIII and XL (b)] Apparatus for **controlling** the relationship between a continuously-travelling element and a device periodically co-operating therewith, comprises **control** means operable by **control** marks or irregularities on the element, and electrical time-delay means (see Group XL (b)) which renders the **control** means ineffective for desired periods after each **control** period has commenced. As applied to apparatus for forming a paper strip into a tube and cutting the tube into lengths to form the bodies of containers each bearing a pattern, an impulse from a photo-electric device influenced by marks on the strip is applied to the grid of a thyatron **valve** whereupon a circuit is closed momentarily to **control** the relationship between the paper-feeding and cutting mechanisms according to the setting of a "selector" mechanism which detects whether the cut is early, late or in correct register. The **control** mechanism is reset after a delay depending on whether **control** is to be exercised by every mark, alternate or other desired marks. Cutting-apparatus.-Two banks of cutters 204, 205, Fig. 9, one on each side of a mandrel 219 extending from the mandrel 290, Fig. 1, on which the tube is formed, are supported on a carriage 201 reciprocated by a cam 358, the forward stroke comprising acceleration, constant speed and gradual deceleration. The cam acts through a lever 367 and an extensible link 368 connected to a lever 369 linked to the carriage, the point of connection being movable by means of a hand-operated worm gear, Fig. 4 (not shown), whereby the stroke of the carriage can be adjusted. The bank 204 is carried by a slide 207 moved into cutting position by cams 220 against the action of springs. The bank 205 is actuated from the bank 204 by an adjustable connection 245... 247. The cams 220 are fixed to a shaft 222 driven by gearing from the output shaft of a reduction gear, the input shaft being driven from the shaft 268 as described below; cutting can be suspended by turning a lever 256 to trip cam rollers 221. To avoid bending the mandrel during cutting, a roller, Fig. 10 (not shown), is lifted into a mandrel-supporting position by cam-blocks on the slide 207, and to prevent lateral displacement of the carriage 201 during its travel, a bar 359 is fixed thereto so as to ride between horizontal rollers 360 and 361. The mandrel 219 telescopes in the mandrel 290 and is rotated by gears and a belt 750 from the shaft 268 and moved longitudinally with the carriage by means of a rod 301. The machine may, alternatively be of the type wherein there is a variable pause between successive cutting cycles. The shaft 268 drives the input shaft of the reduction gear through a differential 500, a variable gear 476 and chain gearing 376, correction of the registration of the cut being applied to the differential by solenoids 392, 393, Fig. 8, acting on a rod 424 adapted to turn an eccentric 404 (Fig. 6) linked to a ball race 204 whereby a shaft 398 driven from a motor 395 is moved axially to bring either of two pairs of clutch discs 399, 406 and 401, 405 into engagement so as to drive one of the bevel gears 411, 412, and rotate a bevel 418 clockwise or anticlockwise, this rotation being applied to the planetary gears of the differential. To obtain a quicker correction, a switch is closed to start a motor 626 connected to the output shaft of the clutch; also, the eccentric 404 may be turned by an over-riding manual **control** lever 423. Selector switch.-Pairs of contacts 431, 432, Fig. 20, are operated by a cam 430 driven from the output shaft of the reduction gearing. The contacts are carried by a table 434 fixed in angularly adjustable position by a screw 433. The pair of contacts 431 is carried by a segment 436 adjustable to vary the angular relationship between the two pairs and consequently the extent of the neutral zone. Specifications 653,613, 703,981 and 743,115, are referred to.

**Classifications:**

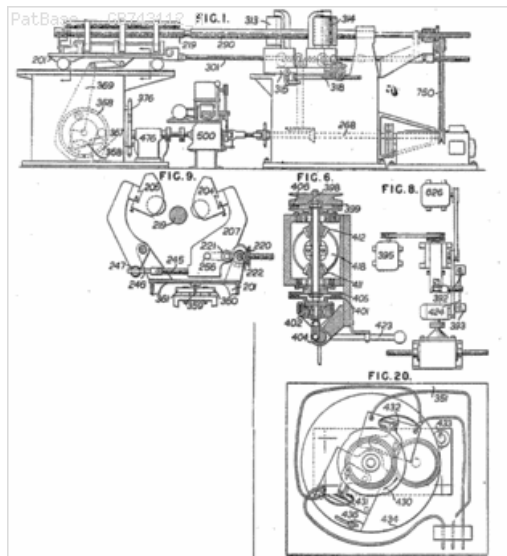
**International (IPC 8-9):** B26D1/60 (Advanced/Invention);

B26D1/00 (Core/Invention)

**International (IPC 1-7):** B31C3/00

**CPC:** B26D1/60

**European:** B26D1/60



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| GB743112 A         | 19560111         | GB19500026936      | 19501103         |

**Priority:**

GB19500026936 19501103

**Probable Assignee:** ERNEST BRADBURY ROBINSON

**Assignee(s):** (std): ERNEST BRADBURY ROBINSON

**Inventor(s):** (std): GILBERT VICTOR HENRY ; ROBINSON ERNEST BRADBURY

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent     | Date recorded | Event group | Code | Event                                | Details |
|------------|---------------|-------------|------|--------------------------------------|---------|
| GB743112 A | 19560111      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| GB743112 A | 19701103      | PEXP        |      | Calculated Patent Term Expiry        |         |

**Title:** Anti-blocking system

**Abstract:** Source: US4815792A In an anti-blocking system for a road vehicle with statically pressure-actuable brake circuits, a pressure modulator with an outlet pressure connected with the wheel brake cylinder is coordinated to each wheel brake, whereby pressure reduction-, pressure build-up and pressure-maintaining-phases of the anti-blocking regulation are attainable by its **controllable** volume change respectively maintaining constant of its volume. The pressure modulators are constructed as stepped cylinders with bore steps of different diameters passing over one into the other, in which a smaller and a larger **control** pressure space is movably delimited by piston steps of corresponding different diameters of a stepped piston, as well as the outlet pressure space, which is formed by an annular space remaining between the piston steps. The larger **control** pressure space is permanently connected with the main brake line of the respective brake circuit. One pressure inlet **control valve** each is connected between the outlet pressure space of the respective pressure modulator and the main brake line, whose base position is the passage position, and which, for the purpose of the anti-blocking regulation is adapted to be activated into the closing position. A function-**control valve** is further provided for each wheel brake, by way of which an auxiliary pressure source, also **valve-controlled**, is adapted to be connected to the smaller **control** pressure space. The output pressure PA is higher by a minimum amount, for example, 10 to 30 bar than the maximum output pressure PB of the brake pressure **control** apparatus multiplied with the ratio F1/F2 of the areas F1 and F2 of the larger piston step and of the smaller piston step.

**Classifications:**

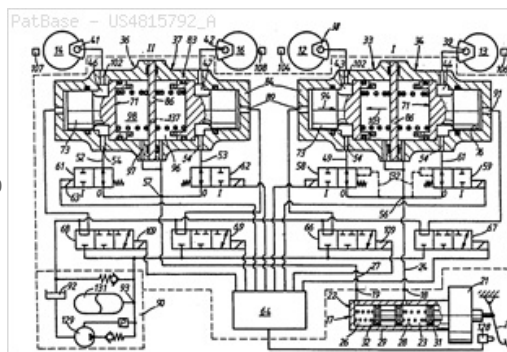
**International (IPC 8-9):** B60T8/34 B60T8/40 B60T8/42 B60T8/48 B60T8/88 B60T8/94 (Advanced/Invention); B60T8/34 B60T8/40 B60T8/42 B60T8/48 B60T8/88 (Core/Invention)

**International (IPC 1-7):** B60K28/16 B60T8/34 B60T8/40 B60T8/42

**CPC:** B60T8/348 B60T8/4233 B60T8/489 B60T8/88 B60T8/94

**European:** B60T8/34D2H B60T8/42A4A B60T8/48B4F B60T8/88 B60T8/94

**US:** 180/197 188/181R 303/100 303/110 303/113 303/113.1 303/190 303/92 303/96



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE3706661 A1       | 19880908         | DE19873706661      | 19870228         |
| DE3706661 C2       | 19901031         | DE19873706661      | 19870228         |
| FR2611359 A1       | 19880902         | FR19880002401      | 19880226         |
| FR2611359 B1       | 19901019         | FR19880002401      | 19880226         |
| GB2203506 A1       | 19881019         | GB19880004537      | 19880226         |
| GB2203506 B2       | 19910918         | GB19880004537      | 19880226         |
| GB8804537 A0       | 19880330         | GB19880004537      | 19880226         |
| JP63297157 A2      | 19881205         | JP19880038792      | 19880223         |
| US4815792 A        | 19890328         | US19880161179      | 19880226         |

**Priority:**

DE19873706661 19870228

**Probable Assignee:** DAIMLER BENZ AG

**Assignee(s):** (std): DAIMLER BENZ AG

**Assignee(s):** DAIMLER BENZ AKTIENGESELLSCHAFT ; DAIMLER BENZ AKTIENGESELLSCHAFT 7000 STUTTGART DE

**Inventor(s):** (std): HARII TORESUTERU ; HARRY TROSTER ; TROESTER HARRY ; TROESTER HARRY DIPL ING ; TROSTER HARRY

**Inventor(s):** TROESTER HARRY DIPL ING 7146 TAMM DE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                                 | Details |
|--------------|---------------|-------------|-------|-------------------------------------------------------|---------|
| DE3706661 A1 | 19880908      | LSPB        | +     | published / reissued                                  |         |
| DE3706661 A1 | 19880908      | LSSES       | +OP8  | REQUEST FOR EXAMINATION AS TO PARAGRAPH 44 PATENT LAW |         |
| DE3706661 A1 | 19901031      | LSGT        | +D2   | GRANT AFTER EXAMINATION                               |         |
| DE3706661 A1 | 19910425      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION               |         |
| DE3706661 C2 | 19901031      | LSGT        | +     | granted / extensions (spc, cpc, pte)                  |         |
| FR2611359 A1 | 19880902      | LSPB        | +     | published / reissued                                  |         |
| FR2611359 A1 | 19941230      | LSLE        | -ST   | NOTIFICATION OF LAPSE                                 |         |
| FR2611359 B1 | 19901019      | LSGT        | +     | granted / extensions (spc,                            |         |

|               |          |      |       |                                                  |                                                                                                                                                                                                         |
|---------------|----------|------|-------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cpc, pte)     |          |      |       |                                                  |                                                                                                                                                                                                         |
| FR2611359 B1  | 20080226 | PEXP |       | Calculated Patent Term Expiry                    |                                                                                                                                                                                                         |
| GB2203506 A1  | 19881019 | LSPB | +     | published / reissued                             |                                                                                                                                                                                                         |
| GB2203506 A1  | 19941026 | LSLE | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE | EFFECTIVE DATE : 19940226                                                                                                                                                                               |
| GB2203506 B2  | 19910918 | LSGT | +     | granted / extensions (spc, cpc, pte)             |                                                                                                                                                                                                         |
| GB2203506 B2  | 20080226 | PEXP |       | Calculated Patent Term Expiry                    |                                                                                                                                                                                                         |
| JP63297157 A2 | 19881205 | LSPB | +     | published / reissued                             |                                                                                                                                                                                                         |
| US4815792 A   | 19890328 | LSGT | +     | granted / extensions (spc, cpc, pte)             |                                                                                                                                                                                                         |
| US4815792 A   | 19880505 | LSAS | AS    | ASSIGNMENT                                       | OWNER NAME : DAIMLER-BENZ AKTIENGESELLSCHAFT, STUTTGART, GERMANY<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.;<br>ASSIGNOR:TROSTER, HARRY;<br>REEL/FRAME:004869/0544<br>EFFECTIVE DATE : 19880301 |
| US4815792 A   | 19880505 | LSAS | AS    | ASSIGNMENT                                       | OWNER NAME : DAIMLER-BENZ AKTIENGESELLSCHAFT,GERMANY<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:TROSTER, HARRY;<br>REEL/FRAME:004869/0544<br>EFFECTIVE DATE : 19880301              |
| US4815792 A   | 19890127 | LSGT | PAT1  | Patented Case                                    |                                                                                                                                                                                                         |
| US4815792 A   | 19920922 | LSFE | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                 |
| US4815792 A   | 19970330 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES        |                                                                                                                                                                                                         |
| US4815792 A   | 19970610 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE    | EFFECTIVE DATE : 19970402                                                                                                                                                                               |

**Title:** METHOD AND DEVICE FOR **CONTROLLING** THE OPERATING TEMPERATURE OF A HYDRAULIC OPERATING MEDIUM OF A DRIVE UNIT OF A VEHICLE

**Abstract:** Source: US2003098147A In a method for **controlling** the operating temperature of a hydraulic operating medium for a drive unit of a vehicle in a selected range, the operating temperature is **controlled** by **controlling** the volume flow of the operating medium for a heat exchange between the operating medium and a secondary heat transfer medium flow medium to a predetermined desired value as a function of the actual value of the operating temperature and as a function of at least one other vehicle parameter, by which a certain temperature influencing effect on the operating medium can be provided. The selected range of the operating temperature includes both the temperature values occurring in the warm-up phase of the drive unit and temperature values, which are substantially higher than the desired value.

**Classifications:**

**International (IPC 8-9):** F16H57/04 (Advanced/Invention);

F16H59/72 (Advanced/Non-invention);

F16H57/04 (Core/Invention);

F16H59/72 (Core/Non-invention)

**International (IPC 1-7):** B60H1/00 F16H57/04 G05D23/02

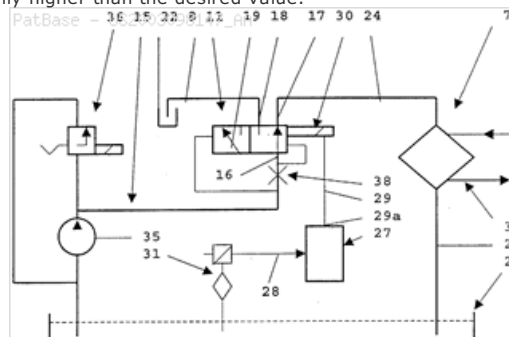
**CPC:** F01P2037/02 F01P2050/06 F01P2060/045 F16H57/0413

F16H59/72

**European:** F16H57/04J2 F16H59/72 R01P37/02 R01P50/06

R01P60/04B R16H59/72

**US:** 165/103 165/202 165/297



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE10157714 A1      | 20030626         | DE20011057714      | 20011124         |
| US2003098147 AA    | 20030529         | US20020303101      | 20021123         |
| US6871703 BB       | 20050329         | US20020303101      | 20021123         |

**Priority:**

DE20011057714 20011124

**Probable Assignee:** DAIMLER AG

**Assignee(s):** (std): DAIMLER CHRYSLER AG

**Assignee(s):** DAIMLERCHRYSLER AG ; KEMMERER BENJAMIN ; SCHAEFER ALBRECHT ; WIELAND DITTMAR ; DAIMLER AG

**Inventor(s):** (std): KEMMNER BENJAMIN ; WIELAND DITTMAR ; SCHAEFER ALBRECHT ; KEMMERER BENJAMIN

**Agent(s):** KLAUS J

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code  | Event                                                                   | Details                                                                                                                                                                                                                     |
|-----------------|---------------|-------------|-------|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DE10157714 A1   | 20030626      | LSPB        | +     | published / reissued                                                    |                                                                                                                                                                                                                             |
| DE10157714 A1   | 20030626      | LSSES       | +OP8  | REQUEST FOR EXAMINATION AS TO PARAGRAPH 44 PATENT LAW                   |                                                                                                                                                                                                                             |
| DE10157714 A1   | 20070503      | LSAS        | 8127  | NEW PERSON/NAME/ADDRESS OF THE APPLICANT                                | OWNER NAME : DAIMLERCHRYSLER AG, 70327 STUTTGART, DE                                                                                                                                                                        |
| DE10157714 A1   | 20080117      | LSAS        | 8127  | NEW PERSON/NAME/ADDRESS OF THE APPLICANT                                | OWNER NAME : DAIMLER AG, 70327 STUTTGART, DE                                                                                                                                                                                |
| DE10157714 A1   | 20101125      | LSWD        | -8130 | WITHDRAWAL                                                              |                                                                                                                                                                                                                             |
| US2003098147 AA | 20030529      | LSPB        | +     | published / reissued                                                    |                                                                                                                                                                                                                             |
| US2003098147 AA | 20130429      | LSLE        | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                                                                                                                                                                             |
| US6871703 BB    | 20050329      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                                                             |
| US6871703 BB    | 20021123      | LSAS        | AS    | ASSIGNMENT                                                              | OWNER NAME : DAIMLERCHRYSLER AG, GERMANY<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS: KEMMERER, BENJAMIN; SCHAEFER, ALBRECHT; WIELAND, DITTMAR;<br>REEL/FRAME: 013523/0788<br>EFFECTIVE DATE : 20021111 |
| US6871703 BB    | 20080924      | LSFE        | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                     |

|              |          |      |       |                                               |                                                                                                                                                                                                   |
|--------------|----------|------|-------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US6871703 BB | 20090424 | LSAS | AS    | ASSIGNMENT                                    | OWNER NAME : DAIMLER AG,GERMANY<br>DESCRIPTION : CHANGE OF NAME;<br>ASSIGNOR:DAIMLERCHRYSLER AG; US-ASSIGNMENT DATABASE<br>UPDATED:20100511;<br>REEL/FRAME:22846/912<br>EFFECTIVE DATE : 20071019 |
| US6871703 BB | 20090424 | LSAS | AS    | ASSIGNMENT                                    | OWNER NAME : DAIMLER AG,GERMANY<br>DESCRIPTION : CHANGE OF NAME;<br>ASSIGNOR:DAIMLERCHRYSLER AG;<br>REEL/FRAME:022846/0912<br>EFFECTIVE DATE : 20071019                                           |
| US6871703 BB | 20090424 | LSAS | AS    | ASSIGNMENT                                    | OWNER NAME : DAIMLER AG,GERMANY<br>DESCRIPTION : CHANGE OF NAME;<br>ASSIGNOR:DAIMLERCHRYSLER AG; REEL/FRAME:22846/912<br>EFFECTIVE DATE : 20071019                                                |
| US6871703 BB | 20090424 | LSAS | AS    | ASSIGNMENT                                    | OWNER NAME : DAIMLER AG,GERMANY<br>DESCRIPTION : CHANGE OF NAME;<br>ASSIGNOR:DAIMLERCHRYSLER AG; US-ASSIGNMENT DATABASE<br>UPDATED:20100216;<br>REEL/FRAME:22846/912<br>EFFECTIVE DATE : 20071019 |
| US6871703 BB | 20090424 | LSAS | AS    | ASSIGNMENT                                    | OWNER NAME : DAIMLER AG,GERMANY<br>DESCRIPTION : CHANGE OF NAME;<br>ASSIGNOR:DAIMLERCHRYSLER AG; US-ASSIGNMENT DATABASE<br>UPDATED:20100225;<br>REEL/FRAME:22846/912<br>EFFECTIVE DATE : 20071019 |
| US6871703 BB | 20090424 | LSAS | AS    | ASSIGNMENT                                    | OWNER NAME : DAIMLER AG,GERMANY<br>DESCRIPTION : CHANGE OF NAME;<br>ASSIGNOR:DAIMLERCHRYSLER AG; US-ASSIGNMENT DATABASE<br>UPDATED:20100330;<br>REEL/FRAME:22846/912<br>EFFECTIVE DATE : 20071019 |
| US6871703 BB | 20090424 | LSAS | AS    | ASSIGNMENT                                    | OWNER NAME : DAIMLER AG,GERMANY<br>DESCRIPTION : CHANGE OF NAME;<br>ASSIGNOR:DAIMLERCHRYSLER AG;<br>REEL/FRAME:022846/0912<br>EFFECTIVE DATE : 20071019                                           |
| US6871703 BB | 20130329 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES     |                                                                                                                                                                                                   |
| US6871703 BB | 20130521 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE | EFFECTIVE DATE : 20130329                                                                                                                                                                         |
| US6871703 BB | 20230710 | PEXP |       | Calculated Patent Term Expiry (PTA 229 days)  |                                                                                                                                                                                                   |

**Title:** MAGNETICALLY OVERRIDDEN FLOW **CONTROL** DEVICE

**Abstract:** Source: US2002077727A A flow **control** device. The flow **control** device comprises a **valve**; an actuator operably connected to and positioning the **valve** and a **controller** operably connected to the actuator and providing **control** signals thereto. An external signal provides **control** input to the **controller**. A magnetically actuated sensor is operatively connected to the **controller** and provides a signal thereto in response to the movement of a magnetic field.

**Classifications:**

**International (ipc 8-9):** F25B41/06 G05D7/06 (Advanced/Invention);

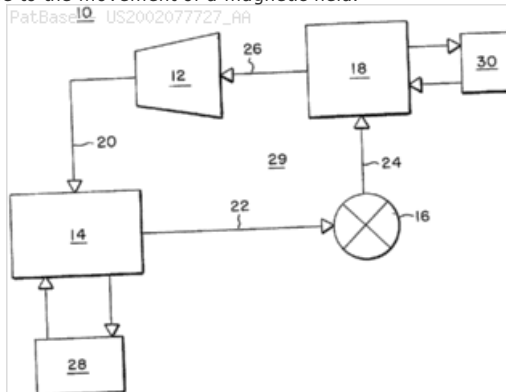
F25B41/06 G05D7/06 (Core/Invention)

**International (ipc 1-7):** G05D11/00 G05D7/00

**CPC:** Y10T137/86397 F25B41/062 G05D7/0635

**European:** F25B41/06B G05D7/06F4B

**US:** 137/624.12 700/282



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2002077727 AA    | 20020620         | US20000738089      | 20001215         |
| US2004249514 AA    | 20041209         | US20040890003      | 20040713         |
| US6917857 BB       | 20050712         | US20000738089      | 20001215         |

**Priority:**

US20000738089 20001215 US20040890003 20040713

**Probable Assignee:** TRANE INT INC

**Assignee(s):** (std): AMERICAN STANDARD INT INC ; RENTMEESTER PAUL C ; MORONEY BRADY J ; VANDERZEE JOEL C

**Assignee(s):** TRANE INT ; TRANE INT INC ; AMERICAN STANDARD INTERNATIONAL INC ; AMERICAN STANDARD INTIONAL ; AMERICAN STANDARD INC ; AMERICAN STANDARD INT

**Inventor(s):** (std): MORONEY BRADY J ; RENTMEESTER PAUL C ; VANDERZEE JOEL C

**Agent(s):** BERES WILLIAM J; ODRISCOLL WILLIAM; WILLIAM; WILLIAM J

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code  | Event                                                   | Details                                                                                                                                                                                                                         |
|-----------------|---------------|-------------|-------|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2002077727 AA | 20020620      | LSPB        | +     | published / reissued                                    |                                                                                                                                                                                                                                 |
| US2004249514 AA | 20041209      | LSPB        | +     | published / reissued                                    |                                                                                                                                                                                                                                 |
| US2004249514 AA | 20071015      | LSWD        | -ABD3 | Abandoned -<br>- Failure to Respond to an Office Action |                                                                                                                                                                                                                                 |
| US2004249514 AA | 20080402      | LSAS        | AS    | ASSIGNMENT                                              | OWNER NAME : TRANE INTERNATIONAL INC., NEW YORK<br>DESCRIPTION : CHANGE OF NAME;<br>ASSIGNOR:AMERICAN STANDARD INTERNATIONAL INC.;<br>REEL/FRAME:020733/0970<br>EFFECTIVE DATE : 20071128                                       |
| US2004249514 AA | 20080402      | LSAS        | AS    | ASSIGNMENT                                              | OWNER NAME : TRANE INTERNATIONAL INC.,NEW YORK<br>DESCRIPTION : CHANGE OF NAME;<br>ASSIGNOR:AMERICAN STANDARD INTERNATIONAL INC.;<br>REEL/FRAME:020733/0970<br>EFFECTIVE DATE : 20071128                                        |
| US2004249514 AA | 20080402      | LSAS        | AS    | ASSIGNMENT                                              | OWNER NAME : TRANE INTERNATIONAL INC.,NEW YORK<br>DESCRIPTION : CHANGE OF NAME;<br>ASSIGNOR:AMERICAN STANDARD INTERNATIONAL INC.; US-ASSIGNMENT DATABASE UPDATED:20100203;<br>REEL/FRAME:20733/970<br>EFFECTIVE DATE : 20071128 |
| US2004249514 AA | 20080402      | LSAS        | AS    | ASSIGNMENT                                              | OWNER NAME : TRANE INTERNATIONAL INC.,NEW YORK<br>DESCRIPTION : CHANGE OF NAME;<br>ASSIGNOR:AMERICAN STANDARD                                                                                                                   |

|                 |          |      |       |                                                       |                                                                                                                                                                                                                                                           |
|-----------------|----------|------|-------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       |                                                       | INTERNATIONAL INC.; US-ASSIGNMENT<br>DATABASE UPDATED:20100216;<br>REEL/FRAME:20733/970<br>EFFECTIVE DATE : 20071128                                                                                                                                      |
| US2004249514 AA | 20080402 | LSAS | AS    | ASSIGNMENT                                            | OWNER NAME : TRANE INTERNATIONAL<br>INC.,NEW YORK<br>DESCRIPTION : CHANGE OF NAME;<br>ASSIGNOR:AMERICAN STANDARD<br>INTERNATIONAL INC.; US-ASSIGNMENT<br>DATABASE UPDATED:20100316;<br>REEL/FRAME:20733/970<br>EFFECTIVE DATE : 20071128                  |
| US2004249514 AA | 20080402 | LSAS | AS    | ASSIGNMENT                                            | OWNER NAME : TRANE INTERNATIONAL<br>INC.,NEW YORK<br>DESCRIPTION : CHANGE OF NAME;<br>ASSIGNOR:AMERICAN STANDARD<br>INTERNATIONAL INC.; US-ASSIGNMENT<br>DATABASE UPDATED:20100330;<br>REEL/FRAME:20733/970<br>EFFECTIVE DATE : 20071128                  |
| US6917857 BB    | 20050712 | LSGT | +     | granted /<br>extensions<br>(spc, cpc,<br>pte)         |                                                                                                                                                                                                                                                           |
| US6917857 BB    | 20001215 | LSAS | AS    | ASSIGNMENT                                            | PARTYTYPE : OWNER<br>OWNER : AMERICAN STANDARD INC.,<br>NEW JERSEY<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:RENTMEESTER, PAUL C.;<br>MORONEY, BRADY J.; VANDERZEE, JOEL<br>C.; REEL/FRAME:011368/0543<br>EFFECTIVE DATE : 20001213 |
| US6917857 BB    | 20040608 | LSAS | AS    | ASSIGNMENT                                            | PARTYTYPE : OWNER<br>OWNER : AMERICAN STANDARD<br>INTERNATIONAL INC, NEW YORK<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:AMERICAN STANDARD INC.;<br>REEL/FRAME:015438/0864<br>EFFECTIVE DATE : 20040525                               |
| US6917857 BB    | 20050622 | LSGT | PAT1  | Patented<br>Case                                      |                                                                                                                                                                                                                                                           |
| US6917857 BB    | 20080402 | LSAS | AS    | ASSIGNMENT                                            | PARTYTYPE : OWNER<br>OWNER : TRANE INTERNATIONAL INC.,<br>NEW YORK<br>OLDPARTY : CHANGE OF NAME;<br>ASSIGNOR:AMERICAN STANDARD<br>INTERNATIONAL INC.;<br>REEL/FRAME:020733/0970<br>EFFECTIVE DATE : 20071128                                              |
| US6917857 BB    | 20080402 | LSAS | AS    | ASSIGNMENT                                            | PARTYTYPE : OWNER<br>OWNER : TRANE INTERNATIONAL<br>INC.,NEW YORK<br>OLDPARTY : CHANGE OF NAME;<br>ASSIGNOR:AMERICAN STANDARD<br>INTERNATIONAL INC.;<br>REEL/FRAME:020733/0970<br>EFFECTIVE DATE : 20071128                                               |
| US6917857 BB    | 20090112 | LSFE | +FPAY | FEE<br>PAYMENT                                        | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                   |
| US6917857 BB    | 20121226 | LSFE | +FPAY | FEE<br>PAYMENT                                        | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                   |
| US6917857 BB    | 20161228 | LSFE | +FPAY | FEE<br>PAYMENT                                        | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                                                  |
| US6917857 BB    | 20211011 | PEXP |       | Calculated<br>Patent Term<br>Expiry (PTA<br>300 days) |                                                                                                                                                                                                                                                           |

**Title:** ELECTRONICALLY-**CONTROLLED** FLUID INJECTOR HAVING PRE-INJECTION PRESSURIZABLE FLUID STORAGE CHAMBER AND OUTWARDLY-OPENING DIRECT-OPERATED CHECK

**Abstract:** Source: US5535723A An improved electronically-**controlled** fluid injector system comprises a fluid storage chamber and a direct-operated check. Pressurization of fluid in the storage chamber begins before the start of fluid injection. Fluid injection begins by hydraulically unbalancing the check. Fluid injection sharply ends by hydraulically balancing the check to allow a biasing device to close the check. A fluid, such as fuel, can be injected as a purely vapor phase to improve mixing with combustion air. The present invention provides improved **control** of several fluid injection parameters, including higher peak fluid injection capability and less fluid injection pressure drop at the end of injection, resulting in improved engine performance and lower emissions, noise, and wear.

**Classifications:**

**International (ipc 8-9):** F02M57/02 F02M59/36

F02M59/46 (Advanced/Invention);

F02M57/00 F02M59/00 F02M59/20 (Core/Invention)

**International (ipc 1-7):** F02M37/04

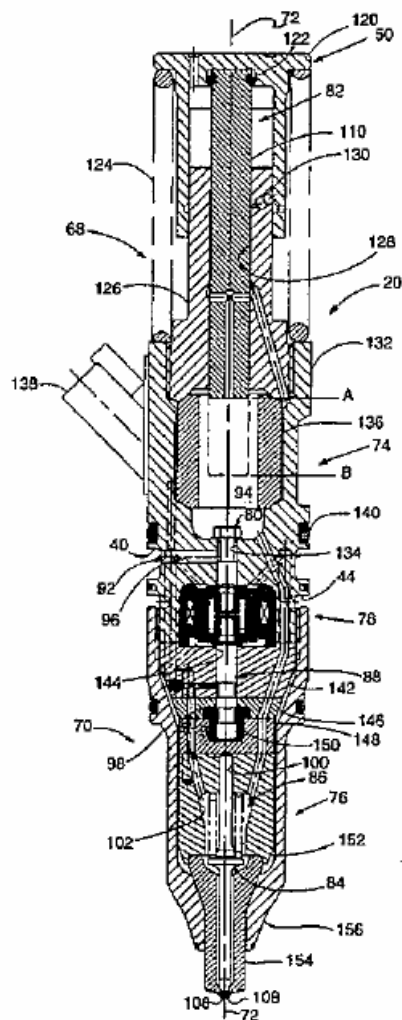
**CPC:** Y02T10/123 F02M57/023 F02B2275/14 F02M59/366

F02M59/466

**European:** F02M57/02C1 F02M59/36D F02M59/46E R02B275/14

**US:** 123/446 123/447 123/506

PatBase - US5535723\_A



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US5535723 A        | 19960716         | US19940282258      | 19940729         |

**Priority:**

US19940282258 19940729

**Probable Assignee:** CATERPILLAR INC

**Assignee(s):** (std): CATERPILLAR INC

**Inventor(s):** (std): GIBSON DENNIS H ; SHINOGLER RONALD D

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent      | Date recorded | Event group | Code | Event                                | Details                                                                                                                                                                                                          |
|-------------|---------------|-------------|------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US5535723 A | 19960716      | LSGT        | +    | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                  |
| US5535723 A | 19940919      | LSAS        | AS   | ASSIGNMENT                           | OWNER NAME : CATERPILLAR INC., ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:GIBSON, DENNIS H.; SHINOGLER, RONALD D.;<br>REEL/FRAME:007241/0609; SIGNING DATES FROM 19940906 TO 19940915 |

|             |          |      |       |                               |                          |
|-------------|----------|------|-------|-------------------------------|--------------------------|
| US5535723 A | 19960703 | LSGT | PAT1  | Patented Case                 |                          |
| US5535723 A | 19991116 | LSFE | +FPAY | FEE PAYMENT                   | YEAR OF FEE PAYMENT : 4  |
| US5535723 A | 20031223 | LSFE | +FPAY | FEE PAYMENT                   | YEAR OF FEE PAYMENT : 8  |
| US5535723 A | 20080104 | LSFE | +FPAY | FEE PAYMENT                   | YEAR OF FEE PAYMENT : 12 |
| US5535723 A | 20140729 | PEXP |       | Calculated Patent Term Expiry |                          |

**Title:** ELECTROHYDRAULIC BRAKE SYSTEM FOR MOTOR VEHICLES

**Abstract:** Source: US2006220451A Disclosed is a brake system which can be operated in three modes of operation, a non-boosted mode of operation, a hydraulically boosted mode of operation, and an electronically **controlled** mode of operation. The brake system includes a master cylinder (1), a first piston (2) coupled to a brake pedal (3), a second piston (4) actuating the master cylinder (1), and a third piston (5) actuable by the first piston (2), with at least one elastic element (6, 7) being provided between the first and the third piston (5), and all three pistons (2, 4, 5) are arranged in a **housing** (8). Further, there is provision of a hydraulic pressure source (9) and a **valve** device (10) for reducing the pressure of the pressure source (9) to a value of pressure that is fed into a space (11) by which the second piston (4) and the third piston (5) are separated from each other in such a fashion that the third piston (5) is acted upon by the pressure acting upon the second piston (4) in the direction being opposite to the direction of application of the second piston (4). A **valve** member (13) of the **valve** device (10) is designed so that its two end surfaces are exposed to the effect of pressure prevailing in the space (11).

**Classifications:**

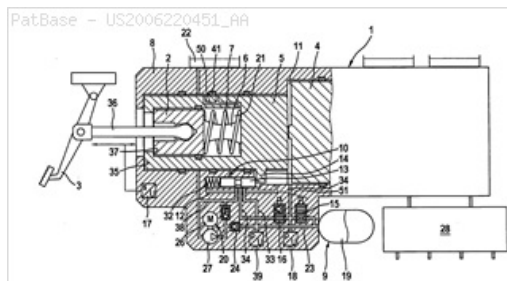
**International (IPC 8-9):** B60T13/14 B60T8/17 B60T8/40 B60T8/44 B60T8/48 (Advanced/Invention)

**International (IPC 1-7):** B60T13/12 B60T13/14 B60T13/66 B60T8/40

**CPC:** B60T8/4018 B60T8/4077 B60T8/4845 B60T13/147

**European:** B60T13/14B3 B60T8/40C B60T8/40J2 B60T8/48B4B

**US:** 303/114.1 303/114.100P



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE10346117 A1      | 20050127         | DE20031046117      | 20031004         |
| DE502004004747 D1  | 20071004         | DE200450004747T    | 20040709         |
| EP1646542 A1       | 20060419         | EP20040766182      | 20040709         |
| EP1646542 B1       | 20070822         | EP20040766182      | 20040709         |
| JP2009513411 T2    | 20090402         | JP20060518229T     | 20040709         |
| US2006220451 AA    | 20061005         | US20040563977      | 20040709         |
| WO05005214 A1      | 20050120         | WO2004EP51446      | 20040709         |

**Priority:**

DE20031030977 20030709 DE20031046117 20031004 WO2004EP51446 20040709

**Probable Assignee:** CONTINENTAL TEVES AND CO OHG AG

**Assignee(s):** (std): CONTINENTAL TEVES AG AND CO OHG ; DRUMM STEFAN A

**Assignee(s):** CONTINENTAL TEVES AND CO AG ; CONTINENTAL TEVES AND CO OHG AG ; CONTINENTAL TEVES AG ; CONTINENTAL TEVES AG AND CO

**Inventor(s):** (std): DRUMM STEFAN A

**Inventor(s):** DRUMM STEFAN

**Agent(s):** CONTINENTAL TEVES INC

**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NA NE NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

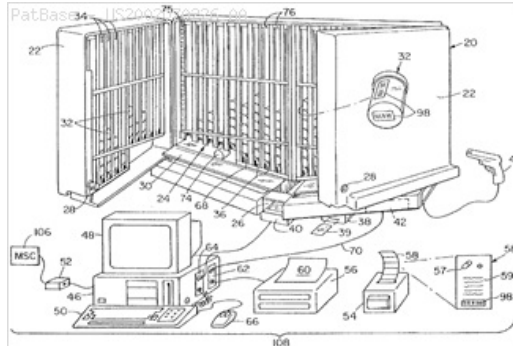
**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code  | Event                                                                   | Details                                                                             |
|-------------------|---------------|-------------|-------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| DE10346117 A1     | 20050127      | LSPB        | +     | published / reissued                                                    |                                                                                     |
| DE10346117 A1     | 20050127      | LSES        | +OM8  | SEARCH REPORT AVAILABLE AS TO PARAGRAPH 43 LIT. 1 SENTENCE 1 PATENT LAW |                                                                                     |
| DE10346117 A1     | 20081016      | LSWD        | -8130 | WITHDRAWAL                                                              |                                                                                     |
| DE502004004747 D1 | 20080911      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                 |                                                                                     |
| EP1646542 A1      | 20060419      | LSPB        | +     | published / reissued                                                    |                                                                                     |
| EP1646542 A1      | 20060419      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                                           | EFFECTIVE DATE : 20060209                                                           |
| EP1646542 A1      | 20061011      | LSES        | +17Q  | FIRST EXAMINATION REPORT                                                | EFFECTIVE DATE : 20060911                                                           |
| EP1646542 A1      | 20161031      | LSFE        | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                          | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20160731<br>YEAR OF FEE PAYMENT : 13 |

|                 |          |      |       |                                                                                       |                                                                                                                            |
|-----------------|----------|------|-------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| EP1646542 A1    | 20161130 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20160721<br>YEAR OF FEE PAYMENT : 13                                        |
| EP1646542 B1    | 20070822 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                            |
| EP1646542 B1    | 20080730 | LSGT | +26N  | NO OPPOSITION FILED                                                                   | EFFECTIVE DATE : 20080526                                                                                                  |
| EP1646542 B1    | 20100430 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20090723<br>YEAR OF FEE PAYMENT : 6                                         |
| EP1646542 B1    | 20110531 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : IT<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20100709 |
| EP1646542 B1    | 20160721 | LSFE | REG   | REFERENCE TO A NATIONAL CODE                                                          | COUNTRY OF REF DOCUMENT : FR<br>REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 13           |
| EP1646542 B1    | 20170724 | LSFE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 14                                           |
| EP1646542 B1    | 20171031 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20170731<br>YEAR OF FEE PAYMENT : 14                                        |
| EP1646542 B1    | 20171031 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20170724<br>YEAR OF FEE PAYMENT : 14                                        |
| EP1646542 B1    | 20240709 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                            |
| JP2009513411 T2 | 20090402 | LSPB | +     | published / reissued                                                                  |                                                                                                                            |
| JP2009513411 T2 | 20100629 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                                   | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20100629                                                |
| JP2009513411 T2 | 20100629 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                                   | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20100629                                                |
| JP2009513411 T2 | 20100928 | LSRE | A521  | WRITTEN AMENDMENT                                                                     | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20100927                                                |
| JP2009513411 T2 | 20100928 | LSRE | A521  | WRITTEN AMENDMENT                                                                     | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20100927                                                |
| JP2009513411 T2 | 20110201 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                                   | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20110201                                                |
| JP2009513411 T2 | 20110201 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                                   | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20110201                                                |
| JP2009513411 T2 | 20110208 | LSRE | A521  | WRITTEN AMENDMENT                                                                     | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE :                                                         |

|                 |          |      |       |                                                                                           |                                                                                                                                                                                                                   |
|-----------------|----------|------|-------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       |                                                                                           | 20110207                                                                                                                                                                                                          |
| JP2009513411 T2 | 20110208 | LSRE | A521  | WRITTEN AMENDMENT                                                                         | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE:<br>A523<br>EFFECTIVE DATE :<br>20110207                                                                                                                              |
| JP2009513411 T2 | 20110531 | LSGT | +A01  | WRITTEN DECISION TO<br>GRANT A PATENT OR<br>TO GRANT A<br>REGISTRATION<br>(UTILITY MODEL) | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A01<br>EFFECTIVE DATE :<br>20110531                                                                                                                                  |
| JP2009513411 T2 | 20111018 | LSWD | -A045 | WRITTEN MEASURE OF<br>DISMISSAL OF<br>APPLICATION                                         | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE:<br>A045<br>EFFECTIVE DATE :<br>20111018                                                                                                                              |
| JP2009513411 T2 | 20111018 | LSWD | -A045 | WRITTEN MEASURE OF<br>DISMISSAL OF<br>APPLICATION                                         | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE:<br>A045<br>EFFECTIVE DATE :<br>20111018                                                                                                                              |
| US2006220451 AA | 20061005 | LSPB | +     | published / reissued                                                                      |                                                                                                                                                                                                                   |
| US2006220451 AA | 20060109 | LSAS | AS    | ASSIGNMENT                                                                                | OWNER NAME :<br>CONTINENTAL TEVES AG<br>AND CO., OHG, GERMANY<br>DESCRIPTION :<br>ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:DRUMM,<br>STEFAN A.;<br>REEL/FRAME:017467/0917<br>EFFECTIVE DATE :<br>20051214 |
| US2006220451 AA | 20090701 | LSWD | -ABD3 | Abandoned -- Failure<br>to Respond to an<br>Office Action                                 |                                                                                                                                                                                                                   |
| WO05005214 A1   | 20050120 | LSPB | +     | published / reissued                                                                      |                                                                                                                                                                                                                   |
| WO05005214 A1   | 20060105 | LSNP | +WWE  | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE                                         | REF DOCUMENT NUMBER :<br>2004766182<br>COUNTRY OF REF<br>DOCUMENT : EP                                                                                                                                            |
| WO05005214 A1   | 20060106 | LSNP | +WWE  | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE                                         | REF DOCUMENT NUMBER :<br>2006518229<br>COUNTRY OF REF<br>DOCUMENT : JP                                                                                                                                            |
| WO05005214 A1   | 20060109 | LSNP | +WWE  | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE                                         | REF DOCUMENT NUMBER :<br>2006220451<br>COUNTRY OF REF<br>DOCUMENT : US                                                                                                                                            |
| WO05005214 A1   | 20060109 | LSNP | +WWE  | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE                                         | REF DOCUMENT NUMBER :<br>10563977<br>COUNTRY OF REF<br>DOCUMENT : US                                                                                                                                              |
| WO05005214 A1   | 20060419 | LSPB | +WWP  | WIPO INFORMATION:<br>PUBLISHED IN<br>NATIONAL OFFICE                                      | REF DOCUMENT NUMBER :<br>2004766182<br>COUNTRY OF REF<br>DOCUMENT : EP                                                                                                                                            |
| WO05005214 A1   | 20061005 | LSPB | +WWP  | WIPO INFORMATION:<br>PUBLISHED IN<br>NATIONAL OFFICE                                      | REF DOCUMENT NUMBER :<br>10563977<br>COUNTRY OF REF<br>DOCUMENT : US                                                                                                                                              |
| WO05005214 A1   | 20070822 | LSGT | +WWG  | WIPO INFORMATION:<br>GRANT IN NATIONAL<br>OFFICE                                          | REF DOCUMENT NUMBER :<br>2004766182<br>COUNTRY OF REF<br>DOCUMENT : EP                                                                                                                                            |



## Legal status (INPADOC)

View legal status timeline

| Patent        | Date recorded | Event group | Code  | Event                                                                                 | Details                                                                                                                                                                                                 |
|---------------|---------------|-------------|-------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AT225159 E    | 20021015      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                         |
| AT225159 E    | 20030415      | LSLE        | -RER  | CEASED AS TO PARAGRAPH 5 LIT. 3 LAW INTRODUCING PATENT TREATIES                       |                                                                                                                                                                                                         |
| AT225159 E    | 20161018      | PEXP        |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                                         |
| DE69624125 D1 | 20031009      | LSOP        | -8363 | OPPOSITION AGAINST THE PATENT                                                         |                                                                                                                                                                                                         |
| DE69624125 D1 | 20060413      | LSGT        | +8365 | FULLY VALID AFTER OPPOSITION PROCEEDINGS                                              |                                                                                                                                                                                                         |
| DE69624125 T2 | 20030626      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                         |
| DE69624125 T2 | 20161018      | PEXP        |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                                         |
| EP0855894 A1  | 19980805      | LSPB        | +     | published / reissued                                                                  |                                                                                                                                                                                                         |
| EP0855894 A1  | 19980805      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                                                         | EFFECTIVE DATE : 19980504                                                                                                                                                                               |
| EP0855894 A1  | 20000112      | LSES        | +17Q  | FIRST EXAMINATION REPORT                                                              | EFFECTIVE DATE : 19991125                                                                                                                                                                               |
| EP0855894 A1  | 20020424      | LSAS        | RAP1  | TRANSFER OF RIGHTS OF AN EP PUBLISHED APPLICATION                                     | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY SOLUTIONS INCORPORATED                                                                                                                                        |
| EP0855894 A1  | 20020626      | LSAS        | RAP1  | TRANSFER OF RIGHTS OF AN EP PUBLISHED APPLICATION                                     | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY SOLUTIONS, INC.                                                                                                                                               |
| EP0855894 A1  | 20021002      | LSLE        | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : AT<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20021002 |
| EP0855894 A1  | 20021002      | LSLE        | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : BE<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20021002 |
| EP0855894 A1  | 20021002      | LSLE        | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : CH<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20021002 |
| EP0855894 A1  | 20021002      | LSLE        | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : LI<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20021002 |
| EP0855894 A1  | 20021002      | LSLE        | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : NL<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20021002 |
| EP0855894 A1  | 20021002      | LSGT        | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D                                                                                                                                                    |

|              |          |      |       |                                                                                                          |                                                                                                                                                                                                                                                                                  |
|--------------|----------|------|-------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP0855894 A1 | 20021015 | LSNP | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                                                                                                                                                                                                               |
| EP0855894 A1 | 20021018 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | COUNTRY OF REF DOCUMENT : IE<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20021018                                                                                                                                                       |
| EP0855894 A1 | 20021030 | LSGT | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : FG4D                                                                                                                                                                                                                             |
| EP0855894 A1 | 20030102 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | COUNTRY OF REF DOCUMENT : DK<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20030102                                                                         |
| EP0855894 A1 | 20030102 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | COUNTRY OF REF DOCUMENT : SE<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20030102                                                                         |
| EP0855894 A1 | 20030303 | LSLE | -NLV1 | NL: LAPSED OR ANNULLED DUE TO FAILURE TO FULFILL THE REQUIREMENTS OF ART. 29P AND 29M OF THE PATENTS ACT | REF COUNTRY CODE : EP                                                                                                                                                                                                                                                            |
| EP0855894 A1 | 20030430 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                                                                                                               |
| EP0855894 A1 | 20030806 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : MM4A                                                                                                                                                                                                                             |
| EP0855894 A1 | 20030903 | LSOP | -26   | OPPOSITION FILED                                                                                         | PARTY TYPE : OPPONENT<br>OPPONENT : CILAG AG<br>INTERNATIONAL<br>EFFECTIVE DATE : 20030702                                                                                                                                                                                       |
| EP0855894 A1 | 20060125 | LSRE | +270  | OPPOSITION REJECTED                                                                                      | EFFECTIVE DATE : 20050829                                                                                                                                                                                                                                                        |
| EP0855894 A1 | 20151019 | LSFE | REG   | REFERENCE TO A NATIONAL CODE                                                                             | COUNTRY OF REF DOCUMENT : FR<br>REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 20                                                                                                                                                                 |
| EP0855894 A1 | 20160129 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20151027<br>YEAR OF FEE PAYMENT : 20                                                                                                                                                                                              |
| EP0855894 A1 | 20160129 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20151028<br>YEAR OF FEE PAYMENT : 20                                                                                                                                                                                              |
| EP0855894 A1 | 20160129 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20151026<br>YEAR OF FEE PAYMENT : 20                                                                                                                                                                                              |
| EP0855894 A1 | 20160229 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20151019<br>YEAR OF FEE PAYMENT : 20                                                                                                                                                                                              |
| EP0855894 A1 | 20160609 | LSAS | REG   | REFERENCE TO A NATIONAL CODE                                                                             | PARTY TYPE : OWNER<br>REF COUNTRY CODE : DE<br>OWNER : ARXIUM, INC.,<br>BUFFALO GROVE, US<br>REF LEGAL EVENT CODE : R081<br>REF DOCUMENT NUMBER : 69624125<br>COUNTRY OF REF DOCUMENT : DE<br>OLD PARTY : FORMER OWNER:<br>TELEPHARMACY SOLUTIONS,<br>INC., BILLERICA, MASS., US |
| EP0855894 A1 | 20161018 | LSLE | REG   | REFERENCE TO A                                                                                           | REF COUNTRY CODE : DE                                                                                                                                                                                                                                                            |

|                 |          |       |       |                                                                                       |                                                                                                                                                                                                                                                             |
|-----------------|----------|-------|-------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |       |       | NATIONAL CODE                                                                         | REF LEGAL EVENT CODE : R071<br>REF DOCUMENT NUMBER : 69624125<br>COUNTRY OF REF DOCUMENT : DE                                                                                                                                                               |
| EP0855894 A1    | 20161109 | LSLE  | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : PE20<br>EXPIRY DATE : 20161017                                                                                                                                                                              |
| EP0855894 A1    | 20170131 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : GB<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF EXPIRATION OF PROTECTION<br>LAPSED DATE : 20161017                                                                                                                                 |
| EP0855894 B1    | 20021002 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                                                                             |
| EP0855894 B1    | 20161017 | PEXP  |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                                                                                             |
| EP0855894 B1    | 20161018 | PEXP  |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                                                                                             |
| EP1226806 A2    | 20020731 | LSPB  | +     | published / reissued                                                                  |                                                                                                                                                                                                                                                             |
| EP1226806 A2    | 20031217 | LSSES | +17P  | REQUEST FOR EXAMINATION FILED                                                         | EFFECTIVE DATE : 20031013                                                                                                                                                                                                                                   |
| EP1226806 A2    | 20040324 | LSFE  | +AKX  | PAYMENT OF DESIGNATION FEES                                                           | DESIGNATED STATE(S) : AT BE CH DE DK FR GB IE IT LI NL SE                                                                                                                                                                                                   |
| EP1226806 A2    | 20050420 | LSSES | +17Q  | FIRST EXAMINATION REPORT                                                              | EFFECTIVE DATE : 20050304                                                                                                                                                                                                                                   |
| EP1226806 A2    | 20060329 | LSDW  | -18D  | DEEMED TO BE WITHDRAWN                                                                | EFFECTIVE DATE : 20050915                                                                                                                                                                                                                                   |
| US2002070226 AA | 20020613 | LSPB  | +     | published / reissued                                                                  |                                                                                                                                                                                                                                                             |
| US2002100762 AA | 20020801 | LSPB  | +     | published / reissued                                                                  |                                                                                                                                                                                                                                                             |
| US2003055531 AA | 20030320 | LSPB  | +     | published / reissued                                                                  |                                                                                                                                                                                                                                                             |
| US2003074218 AA | 20030417 | LSPB  | +     | published / reissued                                                                  |                                                                                                                                                                                                                                                             |
| US2003088333 AA | 20030508 | LSPB  | +     | published / reissued                                                                  |                                                                                                                                                                                                                                                             |
| US2003121929 AA | 20030703 | LSPB  | +     | published / reissued                                                                  |                                                                                                                                                                                                                                                             |
| US2003189058 AA | 20031009 | LSPB  | +     | published / reissued                                                                  |                                                                                                                                                                                                                                                             |
| US2005065645 AA | 20050324 | LSPB  | +     | published / reissued                                                                  |                                                                                                                                                                                                                                                             |
| US2011251718 AA | 20111013 | LSPB  | +     | published / reissued                                                                  |                                                                                                                                                                                                                                                             |
| US5713485 A     | 19980203 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                                                                             |
| US5713485 A     | 19960116 | LSAS  | AS    | ASSIGNMENT                                                                            | PARTYTYPE : OWNER<br>OWNER : ADDS, INC., MASSACHUSETTS<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:LIFF, HAROLD J.; HART, BRIAN T.; WALLACE, ROBERT L.; AND OTHERS;<br>REEL/FRAME:007776/0380<br>EFFECTIVE DATE : 19951213                 |
| US5713485 A     | 19971230 | LSGT  | PAT1  | Patented Case                                                                         |                                                                                                                                                                                                                                                             |
| US5713485 A     | 20010725 | LSFE  | +FPAY | FEE PAYMENT                                                                           | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                     |
| US5713485 A     | 20020919 | LSAS  | AS    | ASSIGNMENT                                                                            | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY SOLUTIONS, INC., MASSACHUSETTS<br>OLDPARTY : CHANGE OF NAME; ASSIGNOR:ADDS, INC.;<br>REEL/FRAME:013288/0418<br>EFFECTIVE DATE : 20000131                                                                          |
| US5713485 A     | 20021021 | LSAS  | AS    | ASSIGNMENT                                                                            | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY SOLUTIONS, INC., MASSACHUSETTS<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:BOSSI, DAVID, EXECUTOR OF THE ESTATE OF INVENTOR ENEA W. BOSSI;<br>REEL/FRAME:013456/0474<br>EFFECTIVE DATE : 19990219 |
| US5713485 A     | 20050802 | LSFE  | +FPAY | FEE PAYMENT                                                                           | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                     |
| US5713485 A     | 20100222 | LSRE  | +PRDP | PATENT REINSTATED                                                                     | EFFECTIVE DATE : 20100226                                                                                                                                                                                                                                   |

|             |          |      |       |                                                          |                                                                                                                                                                                                                                                                            |
|-------------|----------|------|-------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |          |      |       | DUE TO THE<br>ACCEPTANCE OF A<br>LATE MAINTENANCE<br>FEE |                                                                                                                                                                                                                                                                            |
| US5713485 A | 20100226 | LSFE | +FPAY | FEE PAYMENT                                              | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                                                                   |
| US5713485 A | 20150401 | LSAS | AS    | ASSIGNMENT                                               | PARTYTYPE : OWNER<br>OWNER : CALLIDUS CAPITAL<br>CORPORATION, CANADA<br>OLDPARTY : SECURITY<br>INTEREST;<br>ASSIGNOR:TELEPHARMACY<br>SOLUTIONS, INC.;<br>REEL/FRAME:035313/0366<br>EFFECTIVE DATE : 20150306                                                               |
| US5713485 A | 20161215 | LSAS | AS    | ASSIGNMENT                                               | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY<br>SOLUTIONS, INC., ILLINOIS<br>OLDPARTY : RELEASE BY<br>SECURED PARTY;<br>ASSIGNOR:CALLIDUS CAPITAL<br>CORPORATION;<br>REEL/FRAME:040993/0098<br>EFFECTIVE DATE : 20161212                                                      |
| US5713485 A | 20151018 | PEXP |       | Calculated Patent<br>Term Expiry                         |                                                                                                                                                                                                                                                                            |
| US5797515 A | 19980825 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                  |                                                                                                                                                                                                                                                                            |
| US5797515 A | 19960722 | LSAS | AS    | ASSIGNMENT                                               | PARTYTYPE : OWNER<br>OWNER : ADDS, INC.,<br>MASSACHUSETTS<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:LIFF, HAROLD J.;<br>HART, BRIAN T.; WALLACE,<br>ROBERT L.; AND OTHERS;<br>REEL/FRAME:008046/0899<br>EFFECTIVE DATE : 19960614                    |
| US5797515 A | 19980820 | LSGT | PAT1  | Patented Case                                            |                                                                                                                                                                                                                                                                            |
| US5797515 A | 20020426 | LSFE | +FPAY | FEE PAYMENT                                              | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                                    |
| US5797515 A | 20020919 | LSAS | AS    | ASSIGNMENT                                               | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY<br>SOLUTIONS, INC.,<br>MASSACHUSETTS<br>OLDPARTY : CHANGE OF<br>NAME; ASSIGNOR:ADDS, INC.;<br>REEL/FRAME:013288/0414<br>EFFECTIVE DATE : 20000131                                                                                |
| US5797515 A | 20021021 | LSAS | AS    | ASSIGNMENT                                               | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY<br>SOLUTIONS, INC.,<br>MASSACHUSETTS<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:BOSSI, DAVID,<br>EXECUTOR OF THE ESTATE OF<br>INVENTOR ENEA W. BOSSI;<br>REEL/FRAME:013456/0514<br>EFFECTIVE DATE : 19990219 |
| US5797515 A | 20060223 | LSFE | +FPAY | FEE PAYMENT                                              | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                                    |
| US5797515 A | 20100224 | LSFE | +FPAY | FEE PAYMENT                                              | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                                                                   |
| US5797515 A | 20150401 | LSAS | AS    | ASSIGNMENT                                               | PARTYTYPE : OWNER<br>OWNER : CALLIDUS CAPITAL<br>CORPORATION, CANADA<br>OLDPARTY : SECURITY<br>INTEREST;<br>ASSIGNOR:TELEPHARMACY<br>SOLUTIONS, INC.;<br>REEL/FRAME:035313/0366<br>EFFECTIVE DATE : 20150306                                                               |
| US5797515 A | 20161215 | LSAS | AS    | ASSIGNMENT                                               | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY<br>SOLUTIONS, INC., ILLINOIS<br>OLDPARTY : RELEASE BY<br>SECURED PARTY;<br>ASSIGNOR:CALLIDUS CAPITAL<br>CORPORATION;<br>REEL/FRAME:040993/0098<br>EFFECTIVE DATE : 20161212                                                      |
| US5797515 A | 20160503 | PEXP |       | Calculated Patent<br>Term Expiry                         |                                                                                                                                                                                                                                                                            |
| US6068156 A | 20000530 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                  |                                                                                                                                                                                                                                                                            |

|              |          |      |       |                                         |                                                                                                                                                                                                                                                                    |
|--------------|----------|------|-------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US6068156 A  | 19980723 | LSAS | AS    | ASSIGNMENT                              | PARTYTYPE : OWNER<br>OWNER : ADDS,<br>INCORPORATED,<br>MASSACHUSETTS<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:LIFF, HAROLD J.;<br>HART, BRIAN T.; WALLACE,<br>ROBERT L.; AND OTHERS;<br>REEL/FRAME:009335/0390<br>EFFECTIVE DATE : 19980707 |
| US6068156 A  | 20000517 | LSGT | PAT1  | Patented Case                           |                                                                                                                                                                                                                                                                    |
| US6068156 A  | 20020919 | LSAS | AS    | ASSIGNMENT                              | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY<br>SOLUTIONS, INC.,<br>MASSACHUSETTS<br>OLDPARTY : CHANGE OF<br>NAME; ASSIGNOR:ADDS, INC.;<br>REEL/FRAME:013288/0410<br>EFFECTIVE DATE : 20000131                                                                        |
| US6068156 A  | 20031113 | LSFE | +FPAY | FEE PAYMENT                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                            |
| US6068156 A  | 20051216 | LSAS | AS    | ASSIGNMENT                              | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY<br>SOLUTIONS, INCORPORATED,<br>MASSACHUSETT<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:BOSSI, DECEASED,<br>ENEA W.;<br>REEL/FRAME:016902/0294<br>EFFECTIVE DATE : 19990219                           |
| US6068156 A  | 20071121 | LSFE | +FPAY | FEE PAYMENT                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                            |
| US6068156 A  | 20110923 | LSFE | +FPAY | FEE PAYMENT                             | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                                                           |
| US6068156 A  | 20150401 | LSAS | AS    | ASSIGNMENT                              | PARTYTYPE : OWNER<br>OWNER : CALLIDUS CAPITAL<br>CORPORATION, CANADA<br>OLDPARTY : SECURITY<br>INTEREST;<br>ASSIGNOR:TELEPHARMACY<br>SOLUTIONS, INC.;<br>REEL/FRAME:035313/0366<br>EFFECTIVE DATE : 20150306                                                       |
| US6068156 A  | 20161215 | LSAS | AS    | ASSIGNMENT                              | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY<br>SOLUTIONS, INC., ILLINOIS<br>OLDPARTY : RELEASE BY<br>SECURED PARTY;<br>ASSIGNOR:CALLIDUS CAPITAL<br>CORPORATION;<br>REEL/FRAME:040993/0098<br>EFFECTIVE DATE : 20161212                                              |
| US6068156 A  | 20180410 | PEXP |       | Calculated Patent<br>Term Expiry        |                                                                                                                                                                                                                                                                    |
| US6283322 BA | 20010904 | LSGT | +     | granted / extensions<br>(spc, cpc, pte) |                                                                                                                                                                                                                                                                    |
| US6283322 BA | 20010816 | LSGT | PAT1  | Patented Case                           |                                                                                                                                                                                                                                                                    |
| US6283322 BA | 20050301 | LSFE | +FPAY | FEE PAYMENT                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                            |
| US6283322 BA | 20090303 | LSFE | +FPAY | FEE PAYMENT                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                            |
| US6283322 BA | 20130304 | LSFE | +FPAY | FEE PAYMENT                             | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                                                           |
| US6283322 BA | 20150401 | LSAS | AS    | ASSIGNMENT                              | PARTYTYPE : OWNER<br>OWNER : CALLIDUS CAPITAL<br>CORPORATION, CANADA<br>OLDPARTY : SECURITY<br>INTEREST;<br>ASSIGNOR:TELEPHARMACY<br>SOLUTIONS, INC.;<br>REEL/FRAME:035313/0366<br>EFFECTIVE DATE : 20150306                                                       |
| US6283322 BA | 20161215 | LSAS | AS    | ASSIGNMENT                              | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY<br>SOLUTIONS, INC., ILLINOIS<br>OLDPARTY : RELEASE BY<br>SECURED PARTY;<br>ASSIGNOR:CALLIDUS CAPITAL<br>CORPORATION;<br>REEL/FRAME:040993/0098<br>EFFECTIVE DATE : 20161212                                              |
| US6283322 BA | 20200229 | PEXP |       | Calculated Patent                       |                                                                                                                                                                                                                                                                    |

|              |          |      |       | Term Expiry                          |                                                                                                                                                                                                                                       |
|--------------|----------|------|-------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US6471089 BB | 20021029 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                                       |
| US6471089 BB | 20021010 | LSGT | PAT1  | Patented Case                        |                                                                                                                                                                                                                                       |
| US6471089 BB | 20060426 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                               |
| US6471089 BB | 20100422 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                               |
| US6471089 BB | 20140429 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                              |
| US6471089 BB | 20150401 | LSAS | AS    | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : CALLIDUS CAPITAL CORPORATION, CANADA<br>OLDPARTY : SECURITY INTEREST;<br>ASSIGNOR:TELEPHARMACY SOLUTIONS, INC.;<br>REEL/FRAME:035313/0366<br>EFFECTIVE DATE : 20150306                                   |
| US6471089 BB | 20161215 | LSAS | AS    | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY SOLUTIONS, INC., ILLINOIS<br>OLDPARTY : RELEASE BY SECURED PARTY;<br>ASSIGNOR:CALLIDUS CAPITAL CORPORATION;<br>REEL/FRAME:040993/0098<br>EFFECTIVE DATE : 20161212                          |
| US6471089 BB | 20220307 | PEXP |       | Calculated Patent Term Expiry        |                                                                                                                                                                                                                                       |
| US6581798 BB | 20030624 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                                       |
| US6581798 BB | 20030605 | LSGT | PAT1  | Patented Case                        |                                                                                                                                                                                                                                       |
| US6581798 BB | 20061218 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                               |
| US6581798 BB | 20110405 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                               |
| US6581798 BB | 20141224 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                              |
| US6581798 BB | 20150401 | LSAS | AS    | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : CALLIDUS CAPITAL CORPORATION, CANADA<br>OLDPARTY : SECURITY INTEREST;<br>ASSIGNOR:TELEPHARMACY SOLUTIONS, INC.;<br>REEL/FRAME:035313/0366<br>EFFECTIVE DATE : 20150306                                   |
| US6581798 BB | 20160129 | LSAS | AS    | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : ARXIUM, INC., ILLINOIS<br>OLDPARTY : MERGER AND CHANGE OF NAME;<br>ASSIGNORS:TELEPHARMACY SOLUTIONS, INC.;<br>INTELLIGENT HOSPITAL SYSTEMS, INC.;<br>REEL/FRAME:037624/0436<br>EFFECTIVE DATE : 20151222 |
| US6581798 BB | 20161215 | LSAS | AS    | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY SOLUTIONS, INC., ILLINOIS<br>OLDPARTY : RELEASE BY SECURED PARTY;<br>ASSIGNOR:CALLIDUS CAPITAL CORPORATION;<br>REEL/FRAME:040993/0098<br>EFFECTIVE DATE : 20161212                          |
| US6581798 BB | 20210831 | PEXP |       | Calculated Patent Term Expiry        |                                                                                                                                                                                                                                       |
| US6776304 BB | 20040817 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                                       |
| US6776304 BB | 20040729 | LSGT | PAT1  | Patented Case                        |                                                                                                                                                                                                                                       |
| US6776304 BB | 20080214 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                               |
| US6776304 BB | 20110923 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                               |
| US6776304 BB | 20150401 | LSAS | AS    | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : CALLIDUS CAPITAL CORPORATION, CANADA<br>OLDPARTY : SECURITY                                                                                                                                              |

|              |          |      |       |                                                                                  |                                                                                                                                                                                                                                                   |
|--------------|----------|------|-------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       |                                                                                  | INTEREST;<br>ASSIGNOR:TELEPHARMACY<br>SOLUTIONS, INC.;<br>REEL/FRAME:035313/0366<br>EFFECTIVE DATE : 20150306                                                                                                                                     |
| US6776304 BB | 20160129 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : ARXIUM, INC.,<br>ILLINOIS<br>OLDPARTY : MERGER AND<br>CHANGE OF NAME;<br>ASSIGNORS:TELEPHARMACY<br>SOLUTIONS, INC.;<br>INTELLIGENT HOSPITAL<br>SYSTEMS, INC.;<br>REEL/FRAME:037624/0436<br>EFFECTIVE DATE : 20151222 |
| US6776304 BB | 20160817 | LSLE | -LAPS | LAPSE FOR FAILURE<br>TO PAY MAINTENANCE<br>FEES                                  |                                                                                                                                                                                                                                                   |
| US6776304 BB | 20160912 | LSLE | -PEX1 | Patent Expired Due to<br>NonPayment of<br>Maintenance Fees<br>Under 37 CFR 1.362 |                                                                                                                                                                                                                                                   |
| US6776304 BB | 20161004 | LSLE | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE                              | EFFECTIVE DATE : 20160817                                                                                                                                                                                                                         |
| US6776304 BB | 20161215 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY<br>SOLUTIONS, INC., ILLINOIS<br>OLDPARTY : RELEASE BY<br>SECURED PARTY;<br>ASSIGNOR:CALLIDUS CAPITAL<br>CORPORATION;<br>REEL/FRAME:040993/0098<br>EFFECTIVE DATE : 20161212                             |
| US6776304 BB | 20221025 | PEXP |       | Calculated Patent<br>Term Expiry                                                 |                                                                                                                                                                                                                                                   |
| US6814254 BB | 20041109 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                          |                                                                                                                                                                                                                                                   |
| US6814254 BB | 20080506 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                           |
| US6814254 BB | 20120509 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                           |
| US6814254 BB | 20150401 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : CALLIDUS CAPITAL<br>CORPORATION, CANADA<br>OLDPARTY : SECURITY<br>INTEREST;<br>ASSIGNOR:TELEPHARMACY<br>SOLUTIONS, INC.;<br>REEL/FRAME:035313/0366<br>EFFECTIVE DATE : 20150306                                      |
| US6814254 BB | 20161109 | LSLE | -LAPS | LAPSE FOR FAILURE<br>TO PAY MAINTENANCE<br>FEES                                  |                                                                                                                                                                                                                                                   |
| US6814254 BB | 20161205 | LSLE | -PEX1 | Patent Expired Due to<br>NonPayment of<br>Maintenance Fees<br>Under 37 CFR 1.362 |                                                                                                                                                                                                                                                   |
| US6814254 BB | 20161215 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY<br>SOLUTIONS, INC., ILLINOIS<br>OLDPARTY : RELEASE BY<br>SECURED PARTY;<br>ASSIGNOR:CALLIDUS CAPITAL<br>CORPORATION;<br>REEL/FRAME:040993/0098<br>EFFECTIVE DATE : 20161212                             |
| US6814254 BB | 20161227 | LSLE | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE                              | EFFECTIVE DATE : 20161109                                                                                                                                                                                                                         |
| US6814254 BB | 20230214 | PEXP |       | Calculated Patent<br>Term Expiry                                                 |                                                                                                                                                                                                                                                   |
| US6814255 BB | 20041109 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                          |                                                                                                                                                                                                                                                   |
| US6814255 BB | 20080506 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                           |
| US6814255 BB | 20120509 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                           |
| US6814255 BB | 20150401 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : CALLIDUS CAPITAL<br>CORPORATION, CANADA<br>OLDPARTY : SECURITY<br>INTEREST;<br>ASSIGNOR:TELEPHARMACY                                                                                                                 |

|              |          |      |       |                                                                         |                                                                                                                                                                                                                                       |
|--------------|----------|------|-------|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US6814255 BB | 20161109 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                                                                                                                                                                                                                                       |
| US6814255 BB | 20161205 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                                                                                                                                                                                       |
| US6814255 BB | 20161215 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY SOLUTIONS, INC., ILLINOIS<br>OLDPARTY : RELEASE BY SECURED PARTY;<br>ASSIGNOR:CALLIDUS CAPITAL CORPORATION;<br>REEL/FRAME:040993/0098<br>EFFECTIVE DATE : 20161212                          |
| US6814255 BB | 20161227 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20161109                                                                                                                                                                                                             |
| US6814255 BB | 20230411 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                                                                                                                       |
| US7151982 BB | 20061219 | LSGT | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                                                                       |
| US7151982 BB | 20061113 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY SOLUTIONS, INC., PENNSYLVANIA<br>OLDPARTY : CHANGE OF ADDRESS;<br>ASSIGNOR:TELEPHARMACY SOLUTIONS, INC.;<br>REEL/FRAME:018765/0157<br>EFFECTIVE DATE : 20040601                             |
| US7151982 BB | 20061129 | LSGT | PAT1  | Patented Case                                                           |                                                                                                                                                                                                                                       |
| US7151982 BB | 20100611 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                               |
| US7151982 BB | 20140619 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                               |
| US7151982 BB | 20150401 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : CALLIDUS CAPITAL CORPORATION, CANADA<br>OLDPARTY : SECURITY INTEREST;<br>ASSIGNOR:TELEPHARMACY SOLUTIONS, INC.;<br>REEL/FRAME:035313/0366<br>EFFECTIVE DATE : 20150306                                   |
| US7151982 BB | 20160129 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : ARXIUM, INC., ILLINOIS<br>OLDPARTY : MERGER AND CHANGE OF NAME;<br>ASSIGNORS:TELEPHARMACY SOLUTIONS, INC.;<br>INTELLIGENT HOSPITAL SYSTEMS, INC.;<br>REEL/FRAME:037624/0436<br>EFFECTIVE DATE : 20151222 |
| US7151982 BB | 20161215 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY SOLUTIONS, INC., ILLINOIS<br>OLDPARTY : RELEASE BY SECURED PARTY;<br>ASSIGNOR:CALLIDUS CAPITAL CORPORATION;<br>REEL/FRAME:040993/0098<br>EFFECTIVE DATE : 20161212                          |
| US7151982 BB | 20241108 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                                                                                                                       |
| US7427002 BB | 20080923 | LSGT | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                                                                       |
| US7427002 BB | 20071128 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : INT, NEW YORK<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:SCARBOROUGH, AMIRAH;<br>REEL/FRAME:020203/0356<br>EFFECTIVE DATE : 20070101                                                    |
| US7427002 BB | 20080613 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY SOLUTIONS, INC., ILLINOIS                                                                                                                                                                   |

|                                                                                                                                               |          |      |       |                                                                                  |                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----------|------|-------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OLDPARTY : CHANGE OF<br>ASSIGNEE ADDRESS;<br>ASSIGNOR:TELEPHARMACY<br>SOLUTIONS, INC.;<br>REEL/FRAME:021097/0749<br>EFFECTIVE DATE : 20070901 |          |      |       |                                                                                  |                                                                                                                                                                                                                                                   |
| US7427002 BB                                                                                                                                  | 20110923 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                           |
| US7427002 BB                                                                                                                                  | 20150401 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : CALLIDUS CAPITAL<br>CORPORATION, CANADA<br>OLDPARTY : SECURITY<br>INTEREST;<br>ASSIGNOR:TELEPHARMACY<br>SOLUTIONS, INC.;<br>REEL/FRAME:035313/0366<br>EFFECTIVE DATE : 20150306                                      |
| US7427002 BB                                                                                                                                  | 20160129 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : ARXIUM, INC.,<br>ILLINOIS<br>OLDPARTY : MERGER AND<br>CHANGE OF NAME;<br>ASSIGNORS:TELEPHARMACY<br>SOLUTIONS, INC.;<br>INTELLIGENT HOSPITAL<br>SYSTEMS, INC.;<br>REEL/FRAME:037624/0436<br>EFFECTIVE DATE : 20151222 |
| US7427002 BB                                                                                                                                  | 20160923 | LSLE | -LAPS | LAPSE FOR FAILURE<br>TO PAY MAINTENANCE<br>FEES                                  |                                                                                                                                                                                                                                                   |
| US7427002 BB                                                                                                                                  | 20161024 | LSLE | -PEX1 | Patent Expired Due to<br>NonPayment of<br>Maintenance Fees<br>Under 37 CFR 1.362 |                                                                                                                                                                                                                                                   |
| US7427002 BB                                                                                                                                  | 20161115 | LSLE | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE                              | EFFECTIVE DATE : 20160923                                                                                                                                                                                                                         |
| US7427002 BB                                                                                                                                  | 20161215 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY<br>SOLUTIONS, INC., ILLINOIS<br>OLDPARTY : RELEASE BY<br>SECURED PARTY;<br>ASSIGNOR:CALLIDUS CAPITAL<br>CORPORATION;<br>REEL/FRAME:040993/0098<br>EFFECTIVE DATE : 20161212                             |
| US7427002 BB                                                                                                                                  | 20221113 | PEXP |       | Calculated Patent<br>Term Expiry                                                 |                                                                                                                                                                                                                                                   |
| US7991507 BB                                                                                                                                  | 20110802 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                          |                                                                                                                                                                                                                                                   |
| US7991507 BB                                                                                                                                  | 20110713 | LSGT | PAT1  | Patented Case                                                                    |                                                                                                                                                                                                                                                   |
| US7991507 BB                                                                                                                                  | 20110920 | LSRE | CC    | CERTIFICATE OF<br>CORRECTION                                                     |                                                                                                                                                                                                                                                   |
| US7991507 BB                                                                                                                                  | 20150202 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                           |
| US7991507 BB                                                                                                                                  | 20150401 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : CALLIDUS CAPITAL<br>CORPORATION, CANADA<br>OLDPARTY : SECURITY<br>INTEREST;<br>ASSIGNOR:TELEPHARMACY<br>SOLUTIONS, INC.;<br>REEL/FRAME:035313/0366<br>EFFECTIVE DATE : 20150306                                      |
| US7991507 BB                                                                                                                                  | 20160129 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : ARXIUM, INC.,<br>ILLINOIS<br>OLDPARTY : MERGER AND<br>CHANGE OF NAME;<br>ASSIGNORS:TELEPHARMACY<br>SOLUTIONS, INC.;<br>INTELLIGENT HOSPITAL<br>SYSTEMS, INC.;<br>REEL/FRAME:037624/0436<br>EFFECTIVE DATE : 20151222 |
| US7991507 BB                                                                                                                                  | 20161215 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY<br>SOLUTIONS, INC., ILLINOIS<br>OLDPARTY : RELEASE BY<br>SECURED PARTY;<br>ASSIGNOR:CALLIDUS CAPITAL<br>CORPORATION;<br>REEL/FRAME:040993/0098<br>EFFECTIVE DATE : 20161212                             |

|              |          |      |       |                                                                         |                                                                                                                                                                                                              |
|--------------|----------|------|-------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US7991507 BB | 20170126 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : ROYAL BANK OF CANADA, CANADA<br>OLDPARTY : SECURITY INTEREST;<br>ASSIGNOR:ARXIUM, INC.;<br>REEL/FRAME:041496/0130<br>EFFECTIVE DATE : 20170125                                  |
| US7991507 BB | 20221209 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                                                                                              |
| US8280549 BB | 20121002 | LSGT | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                                              |
| US8280549 BB | 20150401 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : CALLIDUS CAPITAL CORPORATION, CANADA<br>OLDPARTY : SECURITY INTEREST;<br>ASSIGNOR:TELEPHARMACY SOLUTIONS, INC.;<br>REEL/FRAME:035313/0366<br>EFFECTIVE DATE : 20150306          |
| US8280549 BB | 20161002 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                                                                                                                                                                                                              |
| US8280549 BB | 20161031 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                                                                                                                                                              |
| US8280549 BB | 20161122 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20161002                                                                                                                                                                                    |
| US8280549 BB | 20161215 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : TELEPHARMACY SOLUTIONS, INC., ILLINOIS<br>OLDPARTY : RELEASE BY SECURED PARTY;<br>ASSIGNOR:CALLIDUS CAPITAL CORPORATION;<br>REEL/FRAME:040993/0098<br>EFFECTIVE DATE : 20161212 |
| US8280549 BB | 20310630 | PEXP |       | Calculated Patent Term Expiry (PTA 10 days)                             |                                                                                                                                                                                                              |
| WO9714393 A1 | 19970424 | LSPB | +     | published / reissued                                                    |                                                                                                                                                                                                              |
| WO9714393 A1 | 19980410 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                             | REF DOCUMENT NUMBER : 09058524<br>COUNTRY OF REF DOCUMENT : US                                                                                                                                               |
| WO9714393 A1 | 19980428 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                             | REF DOCUMENT NUMBER : 1996936716<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                             |
| WO9714393 A1 | 19980805 | LSPB | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE                          | REF DOCUMENT NUMBER : 1996936716<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                             |
| WO9714393 A1 | 19980904 | LSNE | NENP  | NON-ENTRY INTO THE NATIONAL PHASE IN:                                   | REF COUNTRY CODE : JP<br>REF DOCUMENT NUMBER : 97516050<br>FORMAT OF REF DOCUMENT (F/P) : F                                                                                                                  |
| WO9714393 A1 | 19990418 | LSNE | NENP  | NON-ENTRY INTO THE NATIONAL PHASE IN:                                   | REF COUNTRY CODE : CA                                                                                                                                                                                        |
| WO9714393 A1 | 20021002 | LSGT | +WWG  | WIPO INFORMATION: GRANT IN NATIONAL OFFICE                              | REF DOCUMENT NUMBER : 1996936716<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                             |

**Title:** Automotive vehicle brake system

**Abstract:** Source: US4932727A In an anti-lock automotive vehicle brake system comprising a vacuum brake power booster, a considerable reduction of manufacturing and assembling costs is obtained while the system's reliability in operation is simultaneously augmented by the incorporation into this brake system of a second movable wall arranged within the vacuum brake power booster to which a **controllable** pressure differential may be applied. The wall isolates two pneumatic working chambers and, in the case of slip **control**, is movable in a direction opposite to the actuating direction of the master brake cylinder by two compensating cylinders which are connected with the master brake cylinder pressure chambers. A hydraulic chamber which is normally in communication with an unpressurized pressure-fluid supply reservoir is sealed from the reservoir by a retention **valve** during slip **control** to hydraulically prevent brake pedal induced pressure from being applied to the master cylinder.

**Classifications:**

**International (IPC 8-9):** B60T13/52 B60T13/563 B60T13/565

B60T13/66 B60T8/17 B60T8/1761 B60T8/44

B60T8/48 (Advanced/Invention);

B60T13/52 B60T13/66 B60T8/17 B60T8/44 B60T8/48 (Core/Invention)

**International (IPC 1-7):** B60K28/16 B60T13/00 B60T13/14

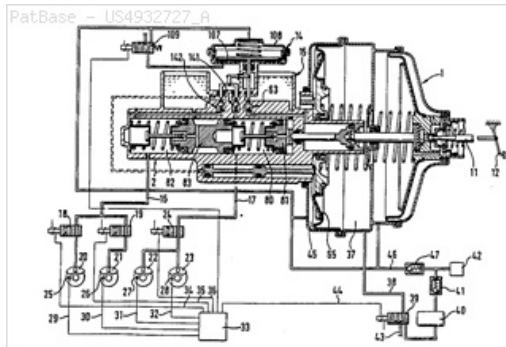
B60T13/52 B60T13/56 B60T13/563 B60T13/565 B60T13/66

B60T8/32 B60T8/44 B60T8/48 B60T8/62 F01B19/00

**CPC:** B60T8/449 B60T8/4854 B60T13/563 B60T13/565

**European:** B60T13/563 B60T13/565 B60T8/44V1A B60T8/48B4B2

**US:** 188/357 303/114 303/114.2 303/114.3 303/119 303/4 60/547.1 92/50



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE3814222 A1       | 19891109         | DE19883814222      | 19880427         |
| DE3817786 A1       | 19891207         | DE19883817786      | 19880526         |
| DE3836710 A1       | 19900503         | DE19883836710      | 19881028         |
| FR2630695 A1       | 19891103         | FR19890005137      | 19890418         |
| FR2638413 A1       | 19900504         | FR19890014003      | 19891025         |
| GB2217800 A1       | 19891101         | GB19890009545      | 19890426         |
| GB2217800 B2       | 19920527         | GB19890009545      | 19890426         |
| GB2226376 A1       | 19900627         | GB19890024251      | 19891027         |
| GB2226376 B2       | 19920916         | GB19890024251      | 19891027         |
| GB2230580 A1       | 19901024         | GB19900009545      | 19900427         |
| GB2230580 B2       | 19920527         | GB19900009545      | 19900427         |
| GB8909545 A0       | 19890614         | GB19890009545      | 19890426         |
| GB8924251 A0       | 19891213         | GB19890024251      | 19891027         |
| GB9009545 A0       | 19900620         | GB19900009545      | 19900427         |
| JP2014962 A2       | 19900118         | JP19890108995      | 19890427         |
| JP2171372 A2       | 19900703         | JP19890281622      | 19891027         |
| US4932727 A        | 19900612         | US19890336948      | 19890412         |
| US5005918 A        | 19910409         | US19890423315      | 19891018         |

**Priority:**

DE19883814222 19880427 DE19883817786 19880526 DE19883836710 19881028  
GB19890009545 19890426

**Probable Assignee:** TEVES GMBH ALFRED

**Assignee(s):** (std): TEVES GMBH ALFRED

**Assignee(s):** CORNING INC ; ALFRED TEVES GMBH ; ALFRED TEVES GMBH 6000 FRANKFURT DE

**Inventor(s):** (std): RUEFFER MANFRED ; WAGNER WILFRIED ; SCHIEL LOTHAR ; ROOTAA SHIIRU ; BIRUFURIIDO BAGUNAA ; MANFUREETO RIYUUFUAA

**Inventor(s):** LOTHAR SCHIEL ; MANFRED RUEFFER ; WILFRIED WAGNER ; RUEFFER MANFRED 6231 SULZBACH DE ; WAGNER WILFRIED 6338 HUETTENBERG DE ; SCHIEL LOTHAR 6238 HOFHEIM DE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                                                   | Details                                                      |
|--------------|---------------|-------------|-------|-------------------------------------------------------------------------|--------------------------------------------------------------|
| DE3814222 A1 | 19891109      | LSPB        | +     | published / reissued                                                    |                                                              |
| DE3814222 A1 | 19891109      | LSSES       | +OM8  | SEARCH REPORT AVAILABLE AS TO PARAGRAPH 43 LIT. 1 SENTENCE 1 PATENT LAW |                                                              |
| DE3814222 A1 | 19940407      | LSLE        | -8139 | DISPOSAL/NON-PAYMENT OF THE ANNUAL FEE                                  |                                                              |
| DE3814222 A1 | 19940526      | LSAS        | 8127  | NEW PERSON/NAME/ADDRESS OF THE APPLICANT                                | OWNER NAME : ITT AUTOMOTIVE EUROPE GMBH, 60488 FRANKFURT, DE |
| DE3817786 A1 | 19891207      | LSPB        | +     | published / reissued                                                    |                                                              |

|              |          |       |       |                                                                                     |                                                                                                                                                                                                                                        |
|--------------|----------|-------|-------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DE3817786 A1 | 19891207 | LSSES | +OM8  | SEARCH REPORT<br>AVAILABLE AS TO<br>PARAGRAPH 43 LIT. 1<br>SENTENCE 1 PATENT<br>LAW |                                                                                                                                                                                                                                        |
| DE3817786 A1 | 19940505 | LSLE  | -8139 | DISPOSAL/NON-<br>PAYMENT OF THE<br>ANNUAL FEE                                       |                                                                                                                                                                                                                                        |
| DE3817786 A1 | 19940623 | LSAS  | 8127  | NEW<br>PERSON/NAME/ADDRESS<br>OF THE APPLICANT                                      | OWNER NAME : ITT<br>AUTOMOTIVE EUROPE GMBH,<br>60488 FRANKFURT, DE                                                                                                                                                                     |
| DE3836710 A1 | 19900503 | LSPB  | +     | published / reissued                                                                |                                                                                                                                                                                                                                        |
| DE3836710 A1 | 19900503 | LSSES | +OM8  | SEARCH REPORT<br>AVAILABLE AS TO<br>PARAGRAPH 43 LIT. 1<br>SENTENCE 1 PATENT<br>LAW |                                                                                                                                                                                                                                        |
| DE3836710 A1 | 19940623 | LSAS  | 8127  | NEW<br>PERSON/NAME/ADDRESS<br>OF THE APPLICANT                                      | OWNER NAME : ITT<br>AUTOMOTIVE EUROPE GMBH,<br>60488 FRANKFURT, DE                                                                                                                                                                     |
| DE3836710 A1 | 19941110 | LSRV  | -8131 | REJECTION                                                                           |                                                                                                                                                                                                                                        |
| FR2630695 A1 | 19891103 | LSPB  | +     | published / reissued                                                                |                                                                                                                                                                                                                                        |
| FR2638413 A1 | 19900504 | LSPB  | +     | published / reissued                                                                |                                                                                                                                                                                                                                        |
| GB2217800 A1 | 19891101 | LSPB  | +     | published / reissued                                                                |                                                                                                                                                                                                                                        |
| GB2217800 A1 | 19941221 | LSLE  | -PCNP | PATENT CEASED<br>THROUGH NON-<br>PAYMENT OF RENEWAL<br>FEE                          | EFFECTIVE DATE : 19940426                                                                                                                                                                                                              |
| GB2217800 B2 | 19920527 | LSGT  | +     | granted / extensions<br>(spc, cpc, pte)                                             |                                                                                                                                                                                                                                        |
| GB2217800 B2 | 20090426 | PEXP  |       | Calculated Patent Term<br>Expiry                                                    |                                                                                                                                                                                                                                        |
| GB2226376 A1 | 19900627 | LSPB  | +     | published / reissued                                                                |                                                                                                                                                                                                                                        |
| GB2226376 A1 | 19940622 | LSLE  | -PCNP | PATENT CEASED<br>THROUGH NON-<br>PAYMENT OF RENEWAL<br>FEE                          | EFFECTIVE DATE : 19931027                                                                                                                                                                                                              |
| GB2226376 B2 | 19920916 | LSGT  | +     | granted / extensions<br>(spc, cpc, pte)                                             |                                                                                                                                                                                                                                        |
| GB2226376 B2 | 20091027 | PEXP  |       | Calculated Patent Term<br>Expiry                                                    |                                                                                                                                                                                                                                        |
| GB2230580 A1 | 19901024 | LSPB  | +     | published / reissued                                                                |                                                                                                                                                                                                                                        |
| GB2230580 A1 | 19931222 | LSLE  | -PCNP | PATENT CEASED<br>THROUGH NON-<br>PAYMENT OF RENEWAL<br>FEE                          | EFFECTIVE DATE : 19930426                                                                                                                                                                                                              |
| GB2230580 B2 | 19920527 | LSGT  | +     | granted / extensions<br>(spc, cpc, pte)                                             |                                                                                                                                                                                                                                        |
| GB2230580 B2 | 20100427 | PEXP  |       | Calculated Patent Term<br>Expiry                                                    |                                                                                                                                                                                                                                        |
| JP2014962 A2 | 19900118 | LSPB  | +     | published / reissued                                                                |                                                                                                                                                                                                                                        |
| JP2171372 A2 | 19900703 | LSPB  | +     | published / reissued                                                                |                                                                                                                                                                                                                                        |
| US4932727 A  | 19900612 | LSGT  | +     | granted / extensions<br>(spc, cpc, pte)                                             |                                                                                                                                                                                                                                        |
| US4932727 A  | 19890412 | LSAS  | AS    | ASSIGNMENT                                                                          | OWNER NAME : ALFRED TEVES<br>GMBH, 7 GUERICKESTRASSE, D-<br>6000 FRANK<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST.;<br>ASSIGNORS:WAGNER,<br>WILFRIED; SCHIEL, LOTHAR;<br>REEL/FRAME:005062/0642<br>EFFECTIVE DATE : 19890330 |
| US4932727 A  | 19900416 | LSGT  | PAT1  | Patented Case                                                                       |                                                                                                                                                                                                                                        |
| US4932727 A  | 19940612 | LSLE  | -LAPS | LAPSE FOR FAILURE TO<br>PAY MAINTENANCE FEES                                        |                                                                                                                                                                                                                                        |
| US4932727 A  | 19940823 | LSLE  | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE                                 | EFFECTIVE DATE : 19940615                                                                                                                                                                                                              |
| US4932727 A  | 19990219 | LSAS  | AS    | ASSIGNMENT                                                                          | OWNER NAME : CORNING<br>INCORPORATED, NEW YORK<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:HNA HOLDINGS,<br>INC.; REEL/FRAME:009556/0470<br>EFFECTIVE DATE : 19990113                                            |

|             |          |      |       |                                                     |                                                                                                                                                                                                                                        |
|-------------|----------|------|-------|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US4932727 A | 20090412 | PEXP |       | Calculated Patent Term<br>Expiry                    |                                                                                                                                                                                                                                        |
| US5005918 A | 19910409 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)             |                                                                                                                                                                                                                                        |
| US5005918 A | 19891018 | LSAS | AS    | ASSIGNMENT                                          | OWNER NAME : ALFRED TEVES<br>GMBH, 7 GUERICKESTRASSE, D-<br>6000 FRANK<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST.;<br>ASSIGNORS:SCHIEL, LOTHAR;<br>RUEFFER, MANFRED;<br>REEL/FRAME:005160/0605<br>EFFECTIVE DATE : 19890825 |
| US5005918 A | 19910206 | LSGT | PAT1  | Patented Case                                       |                                                                                                                                                                                                                                        |
| US5005918 A | 19950409 | LSLE | -LAPS | LAPSE FOR FAILURE TO<br>PAY MAINTENANCE FEES        |                                                                                                                                                                                                                                        |
| US5005918 A | 19950620 | LSLE | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE | EFFECTIVE DATE : 19950412                                                                                                                                                                                                              |
| US5005918 A | 20091018 | PEXP |       | Calculated Patent Term<br>Expiry                    |                                                                                                                                                                                                                                        |

**Title:** AUTOMATIC RANGE SHIFT ARRANGEMENT

**Abstract:** Source: US5263379A An automatic range shift **control** system for automatically **controlling** range section (14) shifting in an otherwise manually shifted range type compound transmission (10) is provided. A sensor (100) senses a value indicative of vehicle ground speed and provides a signal (100A) which is compared to a reference value. If the signal is greater than the reference, an actuator (96) is urged to engage the high speed range ratio and if the signal is less than the reference, the actuator is urged to engage the low speed range ratio.

**Classifications:**

**International (IPC 8-9):** F16H59/36 F16H61/00 F16H61/02 F16H61/12 F16H61/22 F16H61/28 F16H61/70 (Advanced/Invention); F16H61/12 F16H61/16 F16H61/682 F16H61/684

F16H63/44 (Advanced/Non-invention); F16H59/36 F16H61/00 F16H61/02 F16H61/12 F16H61/22 F16H61/28 F16H61/70 (Core/Invention); F16H61/16 F16H61/68 F16H63/00 (Core/Non-invention)

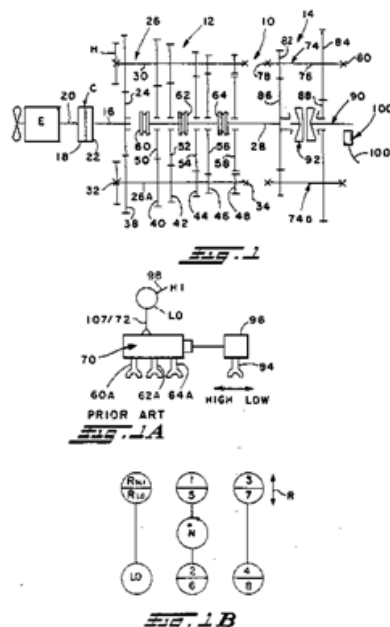
**International (IPC 1-7):** F16H3/08 F16H3/08 F16H5/42 F16H59/36 F16H59/44 F16H61/00 F16H61/02 F16H61/12 F16H61/28 F16H63/44

**CPC:** Y10T74/1926 F16H61/702 B60W2510/0638 B60W2510/104 F16H61/16 F16H61/684 F16H63/44 F16H2059/006 F16H2059/6823 F16H2061/1232 F16H2061/1268 F16H2300/18

**European:** F16H61/02E2 F16H61/70E L60W510/06D L60W510/10E R16H300/18 R16H59/00D R16H59/68F R16H61/12K R16H61/16 R16H61/684 R16H63/44

**US:** 192/3.63 74/336.00R 74/336R

PatBase - US5263379\_A  
U.S. Patent Nov. 23, 1993 Sheet 1 of 5 5,263,379



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CA2085043 AA       | 19930615         | CA19922085043      | 19921210         |
| CA2085043 C        | 20000222         | CA19922085043      | 19921210         |
| DE69206109 D1      | 19951221         | DE19926006109      | 19921209         |
| DE69206109 T2      | 19960509         | DE19926006109T     | 19921209         |
| EP0547829 A2       | 19930623         | EP19920311204      | 19921209         |
| EP0547829 A3       | 19930714         | EP19920311204      | 19921209         |
| EP0547829 B1       | 19951115         | EP19920311204      | 19921209         |
| ES2079806 T3       | 19960116         | ES19920311204T     | 19921209         |
| GB9126586 A0       | 19920212         | GB19910026586      | 19911214         |
| GB9212409 A0       | 19920722         | GB19920012409      | 19920611         |
| JP3577599 B2       | 20041013         | JP19920353665      | 19921214         |
| JP5346158 A2       | 19931227         | JP19920353665      | 19921214         |
| KR100228495 B1     | 19991101         | KR19920023823      | 19921210         |
| KR19930013531 A    | 19930722         | KR19920023823      | 19921210         |
| US5263379 A        | 19931123         | US19920986199      | 19921207         |

**Priority:**

CA19922085043 19921210 GB19910026586 19911214 GB19920012409 19920611

**Probable Assignee:** EATON CORP

**Assignee(s):** (std): EATON CORP

**Assignee(s):** EATON CORP CLEVELAND OHIO US ; GIBBONS DAVID E ; NEWBIGGING IAN M

**Inventor(s):** (std): DEBITSUDO EDOWAADO GIBONZU ; GIBBONS DAVID E ; GIBBONS DAVID EDWARD ; IAN MITSUCHIERU NIYUUBIGINGU ; NEW BIGGING IAN MITCHELL ; NEWBIGGING IAN M ; NEWBIGGING IAN MITCHELL

**Inventor(s):** NEWBIGGING IAN MITCHELL BOLTON MANCHESTER BL6 4RJ GB ; NEWBIGGING IAN MITCHELL BOLTON MANCHESTER BL6... ; NEWBIGGING IAN MITCHELL BOLTON MANCHESTER BL6 4RJ ; GIBBONS DAVID EDWARD CHORLEY LANCASHIRE GB

**Agent(s):** BORDEN LADNER GERVAIS LLP

**Designated states:** DE ES FR GB IT NL SE

**Legal status (INPADOC)**

View legal status timeline

| Patent       | Date recorded | Event group | Code | Event                | Details |
|--------------|---------------|-------------|------|----------------------|---------|
| CA2085043 AA | 19930615      | LSPB        | +    | published / reissued |         |

|               |          |       |       |                                                                                       |                                                                                                                                                                                  |
|---------------|----------|-------|-------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CA2085043 AA  | 19941013 | LSSES | +EEER | EXAMINATION REQUEST                                                                   |                                                                                                                                                                                  |
| CA2085043 AA  | 20061211 | LSLE  | -MKLA | LAPSED                                                                                |                                                                                                                                                                                  |
| CA2085043 C   | 20000222 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                  |
| CA2085043 C   | 20121210 | PEXP  |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                  |
| DE69206109 D1 | 19961212 | LSGT  | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                               |                                                                                                                                                                                  |
| DE69206109 D1 | 20061012 | LSLE  | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                                  |                                                                                                                                                                                  |
| DE69206109 T2 | 19960509 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                  |
| DE69206109 T2 | 20121209 | PEXP  |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                  |
| EP0547829 A2  | 19930623 | LSPB  | +     | published / reissued                                                                  |                                                                                                                                                                                  |
| EP0547829 A2  | 19930901 | LSSES | +17P  | REQUEST FOR EXAMINATION FILED                                                         | EFFECTIVE DATE : 19930705                                                                                                                                                        |
| EP0547829 A2  | 19940928 | LSSES | +17Q  | FIRST EXAMINATION REPORT                                                              | EFFECTIVE DATE : 19940817                                                                                                                                                        |
| EP0547829 A2  | 19960116 | LSGT  | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FG2A<br>REF DOCUMENT NUMBER : 2079806<br>COUNTRY OF REF DOCUMENT : ES<br>KIND CODE OF REF DOCUMENT : T3<br>DESIGNATED STATE(S) : |
| EP0547829 A2  | 19961106 | LSGT  | +26N  | NO OPPOSITION FILED                                                                   |                                                                                                                                                                                  |
| EP0547829 A2  | 20041104 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20041104<br>YEAR OF FEE PAYMENT : 13                                                                                              |
| EP0547829 A2  | 20041111 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : NL<br>PAYMENT DATE : 20041111<br>YEAR OF FEE PAYMENT : 13                                                                                              |
| EP0547829 A2  | 20041201 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20041201<br>YEAR OF FEE PAYMENT : 13                                                                                              |
| EP0547829 A2  | 20041202 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : SE<br>PAYMENT DATE : 20041202<br>YEAR OF FEE PAYMENT : 13                                                                                              |
| EP0547829 A2  | 20041222 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : ES<br>PAYMENT DATE : 20041222<br>YEAR OF FEE PAYMENT : 13                                                                                              |
| EP0547829 A2  | 20041230 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20041230<br>YEAR OF FEE PAYMENT : 13                                                                                              |
| EP0547829 A2  | 20051209 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : GB<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20051209                                                         |
| EP0547829 A2  | 20051209 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : IT<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20051209                                                         |
| EP0547829 A2  | 20051210 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : ES<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20051210                                                         |

|              |          |      |       |                                                                                       |                                                                                                                             |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| EP0547829 A2 | 20051210 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : SE<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20051210 |
| EP0547829 A2 | 20060701 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : DE<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20060701 |
| EP0547829 A2 | 20060701 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : NL<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20060701 |
| EP0547829 A2 | 20060822 | LSLE | -EUG  | SE: EUROPEAN PATENT HAS LAPSED                                                        | REF COUNTRY CODE : EP                                                                                                       |
| EP0547829 A2 | 20060823 | LSLE | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                         | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20051209                                                                          |
| EP0547829 A2 | 20060831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : FR<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20060831 |
| EP0547829 A2 | 20060901 | LSLE | -NLV4 | NL: LAPSED OR ANULLED DUE TO NON-PAYMENT OF THE ANNUAL FEE                            | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20060701                                                                          |
| EP0547829 A2 | 20061117 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST<br>EFFECTIVE DATE : 20060831                                             |
| EP0547829 A2 | 20070316 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FD2A<br>EFFECTIVE DATE : 20051210                                           |
| EP0547829 B1 | 19951115 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                             |
| EP0547829 B1 | 20121209 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                             |
| ES2079806 T3 | 19960116 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                             |
| ES2079806 T3 | 19960116 | LSGT | +FG2A | DEFINITIVE PROTECTION                                                                 | REF DOCUMENT NUMBER : 547829<br>COUNTRY OF REF DOCUMENT : ES                                                                |
| ES2079806 T3 | 20121209 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                             |
| JP3577599 B2 | 20041013 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                             |
| JP3577599 B2 | 20040108 | LSRV | -A02  | DECISION OF REFUSAL                                                                   | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A02<br>EFFECTIVE DATE : 20040107                                               |
| JP3577599 B2 | 20040402 | LSRE | A521  | WRITTEN AMENDMENT                                                                     | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20040401                                              |
| JP3577599 B2 | 20040409 | LSAL | A911  | TRANSFER OF RECONSIDERATION BY EXAMINER BEFORE APPEAL (ZENCHI)                        | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A911<br>EFFECTIVE DATE : 20040408                                              |
| JP3577599 B2 | 20040526 | LSGT | +TRDD | DECISION OF GRANT OR REJECTION WRITTEN                                                |                                                                                                                             |
| JP3577599 B2 | 20040603 | LSGT | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL)         | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A01<br>EFFECTIVE DATE : 20040602                                               |
| JP3577599 B2 | 20040722 | LSFE | +A61  | FIRST PAYMENT OF                                                                      | DESCRIPTION : JAPANESE                                                                                                      |

|                 |          |      |       |                                                                                     |                                                                                                                                                                                                                                                                           |
|-----------------|----------|------|-------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       | ANNUAL FEES<br>(DURING GRANT<br>PROCEDURE)                                          | INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20040630                                                                                                                                                                                                                       |
| JP3577599 B2    | 20040723 | LSGT | +R150 | CERTIFICATE OF<br>PATENT OR<br>REGISTRATION OF<br>UTILITY MODEL                     | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: R150                                                                                                                                                                                                                         |
| JP3577599 B2    | 20070723 | LSLE | -LAPS | CANCELLATION<br>BECAUSE OF NO<br>PAYMENT OF<br>ANNUAL FEES                          |                                                                                                                                                                                                                                                                           |
| JP3577599 B2    | 20121214 | PEXP |       | Calculated Patent<br>Term Expiry                                                    |                                                                                                                                                                                                                                                                           |
| JP5346158 A2    | 19931227 | LSPB | +     | published /<br>reissued                                                             |                                                                                                                                                                                                                                                                           |
| KR100228495 B1  | 19991101 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                          |                                                                                                                                                                                                                                                                           |
| KR100228495 B1  | 19970305 | LSES | A201  | REQUEST FOR<br>EXAMINATION                                                          |                                                                                                                                                                                                                                                                           |
| KR100228495 B1  | 19990529 | LSGT | +E701 | DECISION TO<br>GRANT OR<br>REGISTRATION OF<br>PATENT RIGHT                          |                                                                                                                                                                                                                                                                           |
| KR100228495 B1  | 19990810 | LSGT | +GRNT | WRITTEN<br>DECISION TO<br>GRANT                                                     |                                                                                                                                                                                                                                                                           |
| KR100228495 B1  | 20040713 | LSFE | FPAY  | ANNUAL FEE<br>PAYMENT                                                               | PAYMENT DATE : 20040714<br>YEAR OF FEE PAYMENT : 6                                                                                                                                                                                                                        |
| KR100228495 B1  | 20050811 | LSLE | -LAPS | LAPSE DUE TO<br>UNPAID ANNUAL<br>FEE                                                |                                                                                                                                                                                                                                                                           |
| KR100228495 B1  | 20141101 | PEXP |       | Calculated Patent<br>Term Expiry                                                    |                                                                                                                                                                                                                                                                           |
| KR19930013531 A | 19930722 | LSPB | +     | published /<br>reissued                                                             |                                                                                                                                                                                                                                                                           |
| US5263379 A     | 19931123 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                          |                                                                                                                                                                                                                                                                           |
| US5263379 A     | 19930202 | LSAS | AS    | ASSIGNMENT                                                                          | OWNER NAME : EATON<br>CORPORATION, OHIO<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST.;<br>ASSIGNOR:NEWBIGGING,<br>GIBBONS;<br>REEL/FRAME:006517/0789<br>EFFECTIVE DATE : 19921202                                                                                 |
| US5263379 A     | 19930804 | LSAS | AS    | ASSIGNMENT                                                                          | OWNER NAME : EATON<br>CORPORATION<br>DESCRIPTION : CORRECTIVE<br>ASSIGNMENT PREVIOUSLY<br>RECORDED ON REEL 6517, FRAME<br>789.; ASSIGNORS:NEWBIGGING,<br>IAN MITCHELL; GIBBONS, DAVID<br>EDWARD;<br>REEL/FRAME:006638/0888;<br>SIGNING DATES FROM 19921130<br>TO 19921202 |
| US5263379 A     | 19970423 | LSFE | +FPAY | FEE PAYMENT                                                                         | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                                   |
| US5263379 A     | 20010426 | LSFE | +FPAY | FEE PAYMENT                                                                         | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                                   |
| US5263379 A     | 20051123 | LSLE | -LAPS | LAPSE FOR<br>FAILURE TO PAY<br>MAINTENANCE<br>FEES                                  |                                                                                                                                                                                                                                                                           |
| US5263379 A     | 20051221 | LSLE | -PEX1 | Patent Expired Due<br>to NonPayment of<br>Maintenance Fees<br>Under 37 CFR<br>1.362 |                                                                                                                                                                                                                                                                           |
| US5263379 A     | 20060117 | LSLE | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE                                 | EFFECTIVE DATE : 20051123                                                                                                                                                                                                                                                 |
| US5263379 A     | 20121207 | PEXP |       | Calculated Patent<br>Term Expiry                                                    |                                                                                                                                                                                                                                                                           |

**Title:** METHOD AND EQUIPMENT FOR SANITIZATION OF MEDICAL WASTE

**Abstract:** Source: US5620654A Equipment for automatically sanitizing medical waste is mounted in a tightly closable **housing** (2) provided with charge and discharge openings (9, 10). The **housing** contains a shredder (20) for comminuting the inserted raw waste and for conveying the shredded material to a mixing vessel (32) where it is diluted by water and thoroughly mixed; and a container (27) for storing tubes filled with several kinds of sanitizing materials and which is configured to dispense the required number and kinds of tubes into the shredder in accordance with the pH value of the mixture in the vessel signalled to a selective **valve** mechanism (39) by a sensor attached to the vessel. The equipment further includes a pump (33) for recirculating liquid from the vessel to the shredder, and a pump (34) for draining fluid from the mixing vessel. A conveyor (25) conveys the sanitized waste out of the vessel and out of the **housing**. **Electronic** and **control** equipment is provided for operating the various components.

**Classifications:**

**International (IPC 8-9):** A61L11/00 A61L2/18

B09B3/00 (Advanced/Invention);

A61L11/00 B09B3/00 (Core/Invention)

**International (IPC 1-7):** A61L11/00 A61L2/18 A62D3/00 B02C

B02C18/40 B02C19/12 B09B3/00

**CPC:** A61L11/00 B02C19/0075 B09B3/0075 Y10S588/90

**European:** A61L11/00 B02C19/00W6 B02C19/12M B09B3/00M

**US:** 422/28 422/3 588/205 588/218 588/900

PatBase - US5620654\_A

U.S. Patent Apr. 15, 1997 Sheet 1 of 8 5,620,654

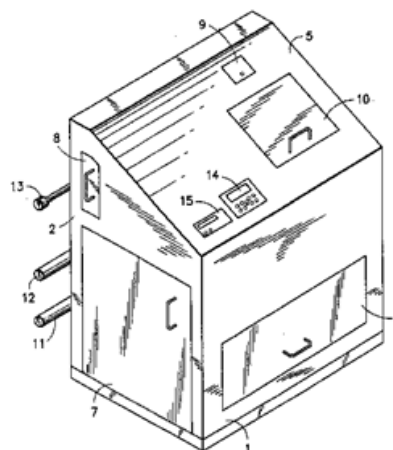


FIG. 1

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT200039 E         | 20010415         | AT19950630001T     | 19950105         |
| AU199510096 A1     | 19950720         | AU19950010096      | 19950109         |
| AU684323 B2        | 19971211         | AU19950010096      | 19950109         |
| CA2139689 AA       | 19950711         | CA19952139689      | 19950106         |
| CA2139689 C        | 19991005         | CA19952139689      | 19950106         |
| DE69520458 D1      | 20010503         | DE19956020458      | 19950105         |
| DE69520458 T2      | 20010712         | DE19956020458T     | 19950105         |
| EP0662346 A1       | 19950712         | EP19950630001      | 19950105         |
| EP0662346 B1       | 20010328         | EP19950630001      | 19950105         |
| ES2156598 T3       | 20010701         | ES19950630001T     | 19950105         |
| IL108311 A0        | 19940412         | IL19940108311      | 19940110         |
| IL108311 A1        | 19990922         | IL19940108311      | 19940110         |
| US5620654 A        | 19970415         | US19950369533      | 19950105         |

**Priority:**

CA19952139689 19950106 IL19940108311 19940110

**Probable Assignee:** MCM ENVIRONMENTAL TECHNOLOGIES INC

**Assignee(s):** (std): BENI MOSENSON ; BENI MOSENSON KIRYAT TIVON ; MOLEDET KFAR BNEI BRITH ; MOSHAV SHITUFI HAKLAI LTD ; MOLEDET KFAR BNEI BRITH MOSHAV ; MOSENSON BENI ; MOSENSON MOLEDET

**Assignee(s):** VINTAGE CAPITAL GROUP LLC ; MOLEDET KFAR BNEI BRITH MOSHAV SHITUFI HAKLAI LTD ; MOLEDET KFAR BNEI BRITH MOSHAV SHITUFI PAKLAI LTD ; CAPRIUS INC ; MCM ENVIRONMENTAL TECHNOLOGIES INC ; MCM ENVIRONMENTAL TECHNOLOGIES LTD

**Inventor(s):** (std): BENI MOSENSON ; MOSENSON BENI

**Agent(s):** GRIFFITH HACK; SIM AND MCBURNEY; GLUCKSMAN LOWY

**Designated states:** AT BE DE ES FR GB IT NL

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent     | Date recorded | Event group | Code | Event                                | Details |
|------------|---------------|-------------|------|--------------------------------------|---------|
| AT200039 E | 20010415      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |

|               |          |      |       |                                                                                       |                                                                                                                                                                                  |
|---------------|----------|------|-------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AT200039 E    | 20010615 | LSPB | +UEP  | PUBLICATION OF TRANSLATION OF EUROPEAN PATENT SPECIFICATION                           |                                                                                                                                                                                  |
| AT200039 E    | 20091015 | LSLE | -REN  | CEASED DUE TO NON-PAYMENT OF THE ANNUAL FEE                                           |                                                                                                                                                                                  |
| AT200039 E    | 20150105 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                  |
| AU684323 B2   | 20150109 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                  |
| CA2139689 AA  | 19950711 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                  |
| CA2139689 AA  | 19970815 | LSES | +EEER | EXAMINATION REQUEST                                                                   |                                                                                                                                                                                  |
| CA2139689 AA  | 20150310 | LSLE | -MKEX | EXPIRY                                                                                | EFFECTIVE DATE : 20150106                                                                                                                                                        |
| CA2139689 C   | 19991005 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                  |
| CA2139689 C   | 20150106 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                  |
| DE69520458 D1 | 20020425 | LSGT | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                               |                                                                                                                                                                                  |
| DE69520458 D1 | 20091119 | LSLE | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                                  |                                                                                                                                                                                  |
| DE69520458 T2 | 20010712 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                  |
| DE69520458 T2 | 20150105 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                  |
| EP0662346 A1  | 19950712 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                  |
| EP0662346 A1  | 19951018 | LSES | +17P  | REQUEST FOR EXAMINATION FILED                                                         | EFFECTIVE DATE : 19950821                                                                                                                                                        |
| EP0662346 A1  | 19971001 | LSES | +17Q  | FIRST EXAMINATION REPORT                                                              | EFFECTIVE DATE : 19970814                                                                                                                                                        |
| EP0662346 A1  | 19991117 | LSRE | RT11  | TITLE (CORRECTION)                                                                    | TEXT : EQUIPMENT FOR SANITIZATION OF MEDICAL WASTE                                                                                                                               |
| EP0662346 A1  | 20010701 | LSGT | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FG2A<br>REF DOCUMENT NUMBER : 2156598<br>COUNTRY OF REF DOCUMENT : ES<br>KIND CODE OF REF DOCUMENT : T3<br>DESIGNATED STATE(S) : |
| EP0662346 A1  | 20020320 | LSGT | +26N  | NO OPPOSITION FILED                                                                   |                                                                                                                                                                                  |
| EP0662346 A1  | 20050105 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : IT<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20050105                                                         |
| EP0662346 A1  | 20080430 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : ES<br>PAYMENT DATE : 20080130<br>YEAR OF FEE PAYMENT : 14                                                                                              |
| EP0662346 A1  | 20080430 | LSRE | +PGRI | POSTGRANT: PATENT REINSTATED IN CONTRACTING STATE                                     | COUNTRY OF REF DOCUMENT : IT<br>REINSTATED DATE : 20080301                                                                                                                       |
| EP0662346 A1  | 20080530 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20080122<br>YEAR OF FEE PAYMENT : 14                                                                                              |
| EP0662346 A1  | 20080530 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20080124<br>YEAR OF FEE PAYMENT : 14                                                                                              |
| EP0662346 A1  | 20080530 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20080125<br>YEAR OF FEE PAYMENT : 14                                                                                              |
| EP0662346 A1  | 20080530 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID                                                           | COUNTRY OF REF DOCUMENT : NL<br>PAYMENT DATE : 20080115                                                                                                                          |

|              |          |      |       |                                                                                       |                                                                                                                             |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| EP0662346 A1 | 20080630 | LSFE | +PGFP | TO NATIONAL OFFICE<br>POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                  | YEAR OF FEE PAYMENT : 14<br>COUNTRY OF REF DOCUMENT : AT<br>PAYMENT DATE : 20080116<br>YEAR OF FEE PAYMENT : 14             |
| EP0662346 A1 | 20080731 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20080111<br>YEAR OF FEE PAYMENT : 14                                         |
| EP0662346 A1 | 20080829 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : BE<br>PAYMENT DATE : 20080304<br>YEAR OF FEE PAYMENT : 14                                         |
| EP0662346 A1 | 20090923 | LSLE | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                         | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20090105                                                                          |
| EP0662346 A1 | 20091001 | LSLE | -NLV4 | NL: LAPSED OR ANULLED DUE TO NON-PAYMENT OF THE ANNUAL FEE                            | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20090801                                                                          |
| EP0662346 A1 | 20091030 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : AT<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20090105 |
| EP0662346 A1 | 20091030 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : DE<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20090801 |
| EP0662346 A1 | 20091127 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST<br>EFFECTIVE DATE : 20091030                                             |
| EP0662346 A1 | 20091130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : GB<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20090105 |
| EP0662346 A1 | 20091130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : NL<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20090801 |
| EP0662346 A1 | 20100226 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : BE<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20090131 |
| EP0662346 A1 | 20100329 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FD2A<br>EFFECTIVE DATE : 20090107                                           |
| EP0662346 A1 | 20100430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : ES<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20090107 |
| EP0662346 A1 | 20100430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : FR<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20090202 |
| EP0662346 A1 | 20110331 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : IT<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20090105 |
| EP0662346 B1 | 20010328 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                             |
| EP0662346 B1 | 20150105 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                             |

|              |          |      |       |                                      |                                                                                                                                                                                                                                                        |
|--------------|----------|------|-------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ES2156598 T3 | 20010701 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                                                        |
| ES2156598 T3 | 20010701 | LSGT | +FG2A | DEFINITIVE PROTECTION                | REF DOCUMENT NUMBER : 662346<br>COUNTRY OF REF DOCUMENT : ES                                                                                                                                                                                           |
| ES2156598 T3 | 20150105 | PEXP |       | Calculated Patent Term Expiry        |                                                                                                                                                                                                                                                        |
| IL108311 A0  | 20000131 | LSGT | +FF   | PATENT GRANTED                       |                                                                                                                                                                                                                                                        |
| IL108311 A0  | 20080210 | LSFE | +KB   | PATENT RENEWED                       |                                                                                                                                                                                                                                                        |
| IL108311 A0  | 20120229 | LSFE | +KB   | PATENT RENEWED                       |                                                                                                                                                                                                                                                        |
| IL108311 A0  | 20140930 | LSLE | -EXP  | PATENT EXPIRED                       |                                                                                                                                                                                                                                                        |
| IL108311 A1  | 19990922 | LSPB | +     | published / reissued                 |                                                                                                                                                                                                                                                        |
| US5620654 A  | 19970415 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                                                        |
| US5620654 A  | 19950221 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : MOLEDET, KFAR BNEI BRITH, MOSHAV SHITUFI PAKLAI LT<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:MOSENSON, BENI;<br>REEL/FRAME:007356/0161<br>EFFECTIVE DATE : 19950127                                                  |
| US5620654 A  | 19970403 | LSGT | PAT1  | Patented Case                        |                                                                                                                                                                                                                                                        |
| US5620654 A  | 19980421 | LSRE | CC    | CERTIFICATE OF CORRECTION            |                                                                                                                                                                                                                                                        |
| US5620654 A  | 20000920 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                |
| US5620654 A  | 20020621 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : CAPRIUS, INC., NEW JERSEY<br>DESCRIPTION : RIDER TO SECURITY AGREEMENT; ASSIGNOR:MCM ENVIRONMENTAL TECHNOLOGIES LTD.; REEL/FRAME:013076/0554<br>EFFECTIVE DATE : 20020610                                                                 |
| US5620654 A  | 20020723 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : CAPRIUS, INC, NEW JERSEY<br>DESCRIPTION : RIDER TO SECURITY AGREEMENT; ASSIGNOR:MCM ENVIRONMENTAL TECHNOLOGIES LTD; REEL/FRAME:013125/0265<br>EFFECTIVE DATE : 20020610                                                                   |
| US5620654 A  | 20040812 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                |
| US5620654 A  | 20080929 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                                               |
| US5620654 A  | 20090911 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : M.C.M. ENVIRONMENTAL TECHNOLOGIES LTD., ISRAEL<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:MOSENSON, BENI;<br>MOSHAV MOLEDET;<br>REEL/FRAME:023220/0162<br>EFFECTIVE DATE : 19981117                                  |
| US5620654 A  | 20090916 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : MCM ENVIRONMENTAL TECHNOLOGIES, INC., NEW JERSEY<br>DESCRIPTION : RELEASE BY SECURED PARTY;<br>ASSIGNOR:CAPRIUS, INC.;<br>REEL/FRAME:023234/0478<br>EFFECTIVE DATE : 20090909                                                             |
| US5620654 A  | 20091216 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : M.C.M. ENVIRONMENTAL TECHNOLOGIES, INC., NEW JERSEY<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:M.C.M. ENVIRONMENTAL TECHNOLOGIES LTD.;<br>REEL/FRAME:023660/0670<br>EFFECTIVE DATE : 20091211                         |
| US5620654 A  | 20091216 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : VINTAGE CAPITAL GROUP, LLC, CALIFORNIA<br>DESCRIPTION : SECURITY AGREEMENT; ASSIGNORS:CAPRIUS, INC.; M.C.M. ENVIRONMENTAL TECHNOLOGIES, INC.; M.C.M. ENVIRONMENTAL TECHNOLOGIES LTD.; REEL/FRAME:023660/0691<br>EFFECTIVE DATE : 20091216 |

US5620654 A

20150105

PEXP

Calculated Patent  
Term Expiry

**Title:** Gasoline container

**Abstract:** Source: USD305982S (Claims)The ornamental design for a gasoline container, as shown and described.

**Classifications:**

**US:** D23/211.1 D9/527

PatBase - USD305982\_S1

U.S. Patent Feb. 13, 1990 Sheet 1 of 3 D305,982



FIG. 1



FIG. 2

#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| USD305982 S1       | 19900213         | US19870710704F     | 19871008         |

#### Priority:

US198707107043D 19871008

**Probable Assignee:** EAGLE MFG CO

**Assignee(s):** EAGLE MFG ; EAGLE MFG CO

**Inventor(s):** DONALD J MITCHELL ; JOHN G GILLISPIE ; MITCHELL WV

#### Legal status (INPADOC)

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code | Event                                | Details |
|--------------|---------------|-------------|------|--------------------------------------|---------|
| USD305982 S1 | 19900213      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| USD305982 S1 | 19891209      | LSGT        | PAT1 | Patented Case                        |         |
| USD305982 S1 | 20040213      | PEXP        |      | Calculated Patent Term Expiry        |         |

**Title:** Automotive lift system

**Abstract:** Source: US5096159A An automotive lift system includes a number of longitudinal transverse pairs of left and right legs each of which legs, include a top and a bottom. Each bottom is pivotally stationed to a base which in turn is positioned upon a floor. The lift system eliminates the need for torsion bars and provides ease of front-to-back and left-to-right access beneath an automotive vehicle that has been elevated.

**Classifications:**

**International (IPC 8-9):** B66F3/46 B66F7/06 B66F7/08 B66F7/12 B66F7/20 (Advanced/Invention);

B66F7/06 (Advanced/Non-invention);

B66F3/00 B66F7/06 B66F7/10 (Core/Invention)

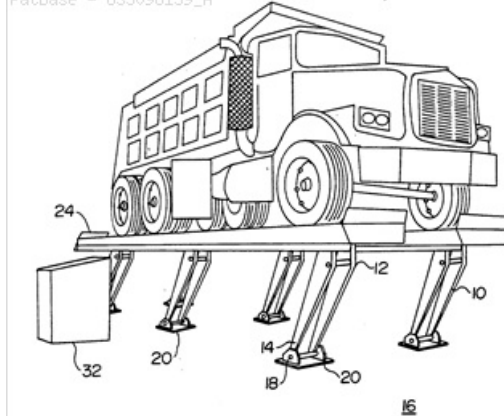
**International (IPC 1-7):** B66F7/06 B66F7/12 E04H6/04

**CPC:** B66F7/0641 B66F7/08

**European:** B66F7/06S B66F7/08

**US:** 187/211 254/10R 254/89H 254/90 D34/031 D34/31

PatBase - US5096159\_A



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT155759 E         | 19970815         | AT19920909139T     | 19920116         |
| AU199216777 A1     | 19920827         | AU19920016777      | 19920116         |
| BRPI9205456 A      | 19931123         | BR1992PI05456      | 19920116         |
| CA2099878 AA       | 19930705         | CA19922099878      | 19920116         |
| DE69221122 D1      | 19970904         | DE19926021122      | 19920116         |
| DE69221122 T2      | 19980129         | DE19926021122T     | 19920116         |
| DK0566699 T3       | 19980302         | DK19920909139T     | 19920116         |
| EP0566699 A1       | 19931027         | EP19920909139      | 19920116         |
| EP0566699 A4       | 19940810         | EP19920909139      | 19920116         |
| EP0566699 B1       | 19970723         | EP19920909139      | 19920116         |
| ES2106863 T3       | 19971116         | ES19920909139T     | 19920116         |
| JP6500524 T2       | 19940120         | JP19920508740T     | 19920116         |
| KR19937002219 A    | 19930908         | KR19937001133      | 19920116         |
| MX9200221 A1       | 19930801         | MX19920000221      | 19920117         |
| US5096159 A        | 19920317         | US19910643021      | 19910118         |
| US5199686 A        | 19930406         | US19920815748      | 19920102         |
| WO9212924 A1       | 19920806         | WO1992US00395      | 19920116         |

**Priority:**

US19910643021 19910118 US19910643021 19910118 US19920815748 19920102  
WO1992US00395 19920116

**Probable Assignee:** ROTARY LIFT CO

**Assignee(s):** (std): ADVANTEGE LIFT SYSTEMS INC ; ADVANTAGE LIFT SYS INC ; ADVANTAGE LIFT SYSTEMS INC

**Assignee(s):** ADVANTAGE LIFT SYSTEMS INC A CORP OF CA ; ADVANTAGE LIFT SYSTEMS INC SAN DIEGO CALIF US ; ROTARY LIFT ; DELAWARE CAPITAL FORMATION INC ; IMP BANK ; CLOVE PARK INSURANCE CO ; CP FORMATION LLC ; ROTARY LIFT CO ; DELAWARE CAPITAL FORMATION INC A CORP OF DELAWARE ; ADVANTEGE LIFT SYSTEMS INC SAN DIEGO CALIF US ; FLETCHER ROBERT H

**Inventor(s):** (std): FLETCHER ROBERT H ; ROBERT H FLETCHER ; FLETCHER ROBERT

**Agent(s):** BLAKE CASSELS AND GRAYDON LLP

**Designated states:** AT AU BE BR CA CH DE DK ES FR GB GR IT JP KR LI LU MC NL RU SE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent        | Date recorded | Event group | Code | Event                                                           | Details |
|---------------|---------------|-------------|------|-----------------------------------------------------------------|---------|
| AT155759 E    | 19970815      | LSGT        | +    | granted / extensions (spc, cpc, pte)                            |         |
| AT155759 E    | 19980115      | LSLE        | -RER | CEASED AS TO PARAGRAPH 5 LIT. 3 LAW INTRODUCING PATENT TREATIES |         |
| AT155759 E    | 20120116      | PEXP        |      | Calculated Patent Term Expiry                                   |         |
| BRPI9205456 A | 19931123      | LSPB        | +    | published / reissued                                            |         |
| BRPI9205456 A | 19970311      | LSGT        | +FF  | DECISION: INTENTION TO GRANT                                    |         |

|               |          |      |       |                                                                                                         |                                                                                                                                                                                                            |
|---------------|----------|------|-------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BRPI9205456 A | 19971125 | LSGT | +FG9A | PATENT OR<br>CERTIFICATE OF<br>ADDITION<br>GRANTED                                                      |                                                                                                                                                                                                            |
| BRPI9205456 A | 20110405 | LSFE | B24C  | PATENT ANNUAL<br>FEE: CALLING FOR<br>RESTORATION                                                        | DESCRIPTION : REFERENTE A 8A,<br>9A, 10A, 11A, 12A, 13A, 14A,<br>15A, 16A, 17A, 18A E 19A<br>ANUIDADE(S).                                                                                                  |
| BRPI9205456 A | 20140826 | LSLE | -B24H | LAPSE BECAUSE OF<br>NON-PAYMENT OF<br>ANNUAL FEES<br>(DEFINITIVELY:<br>ART 78 IV LPI)                   |                                                                                                                                                                                                            |
| CA2099878 AA  | 19930705 | LSPB | +     | published /<br>reissued                                                                                 |                                                                                                                                                                                                            |
| CA2099878 AA  | 19930705 | LSNP | +AFNE | NATIONAL PHASE<br>ENTRY                                                                                 |                                                                                                                                                                                                            |
| CA2099878 AA  | 20000117 | LSLE | -FZDE | DEAD                                                                                                    |                                                                                                                                                                                                            |
| DE69221122 D1 | 19980820 | LSGT | +8364 | NO OPPOSITION<br>DURING TERM OF<br>OPPOSITION                                                           |                                                                                                                                                                                                            |
| DE69221122 D1 | 19990218 | LSLE | -8339 | CEASED/NON-<br>PAYMENT OF THE<br>ANNUAL FEE                                                             |                                                                                                                                                                                                            |
| DE69221122 T2 | 19980129 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                              |                                                                                                                                                                                                            |
| DE69221122 T2 | 20120116 | PEXP |       | Calculated Patent<br>Term Expiry                                                                        |                                                                                                                                                                                                            |
| DK0566699 T3  | 19980302 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                              |                                                                                                                                                                                                            |
| DK0566699 T3  | 20120116 | PEXP |       | Calculated Patent<br>Term Expiry                                                                        |                                                                                                                                                                                                            |
| EP0566699 A1  | 19931027 | LSPB | +     | published /<br>reissued                                                                                 |                                                                                                                                                                                                            |
| EP0566699 A1  | 19931027 | LSES | +17P  | REQUEST FOR<br>EXAMINATION<br>FILED                                                                     | EFFECTIVE DATE : 19930812                                                                                                                                                                                  |
| EP0566699 A1  | 19940810 | LSES | +A4   | DESPATCH OF<br>SUPPLEMENTARY<br>SEARCH REPORT                                                           |                                                                                                                                                                                                            |
| EP0566699 A1  | 19950322 | LSES | +17Q  | FIRST<br>EXAMINATION<br>REPORT                                                                          | EFFECTIVE DATE : 19950207                                                                                                                                                                                  |
| EP0566699 A1  | 19970723 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : LI<br>EFFECTIVE DATE : 19970723                                                                                                                                                         |
| EP0566699 A1  | 19970723 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : BE<br>EFFECTIVE DATE : 19970723                                                                                                                                                         |
| EP0566699 A1  | 19970723 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : FR<br>DESCRIPTION : THE PATENT HAS<br>BEEN ANNULLED BY A DECISION<br>OF A NATIONAL AUTHORITY<br>EFFECTIVE DATE : 19970723                                                               |
| EP0566699 A1  | 19970723 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : GR<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE FEE<br>WITHIN THE PRESCRIBED TIME-<br>LIMIT<br>EFFECTIVE DATE : 19970723 |
| EP0566699 A1  | 19970723 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : AT<br>EFFECTIVE DATE : 19970723                                                                                                                                                         |
| EP0566699 A1  | 19970723 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT                                          | REF COUNTRY CODE : CH<br>EFFECTIVE DATE : 19970723                                                                                                                                                         |

|              |          |      |       |                                                                                                         |                                                                                                                                                                                                      |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | INFORM. FROM<br>NAT. OFFICE TO<br>EPO                                                                   |                                                                                                                                                                                                      |
| EP0566699 A1 | 19970731 | LSNP | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                         | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                                                                                                                                   |
| EP0566699 A1 | 19971116 | LSGT | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                         | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FG2A<br>REF DOCUMENT NUMBER :<br>2106863<br>COUNTRY OF REF DOCUMENT : ES<br>KIND CODE OF REF DOCUMENT :<br>T3<br>FORMAT OF REF DOCUMENT (F/P)<br>: P |
| EP0566699 A1 | 19980116 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : LU<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 19980116                                                                                      |
| EP0566699 A1 | 19980116 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 19980116                                                                                      |
| EP0566699 A1 | 19980117 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : ES<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 19980117                                                                                      |
| EP0566699 A1 | 19980117 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : SE<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 19980117                                                                                      |
| EP0566699 A1 | 19980130 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                         | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                                   |
| EP0566699 A1 | 19980202 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : DK<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 19980202                                                                                      |
| EP0566699 A1 | 19980715 | LSGT | +26N  | NO OPPOSITION<br>FILED                                                                                  |                                                                                                                                                                                                      |
| EP0566699 A1 | 19980731 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : MC<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 19980731                                                                                      |
| EP0566699 A1 | 19980801 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : NL<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 19980801                                                                                      |
| EP0566699 A1 | 19980902 | LSLE | -GBPC | GB: EUROPEAN<br>PATENT CEASED<br>THROUGH NON-<br>PAYMENT OF<br>RENEWAL FEE                              | EFFECTIVE DATE : 19980116                                                                                                                                                                            |
| EP0566699 A1 | 19981001 | LSLE | -NLV4 | NL: LAPSED OR<br>ANULLED DUE TO<br>NON-PAYMENT OF<br>THE ANNUAL FEE                                     | EFFECTIVE DATE : 19980801                                                                                                                                                                            |
| EP0566699 A1 | 19981001 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 19981001                                                                                      |
| EP0566699 A1 | 19981005 | LSLE | -EUG  | SE: EUROPEAN<br>PATENT HAS<br>LAPSED                                                                    | REF DOCUMENT NUMBER :<br>92909139.5<br>FORMAT OF REF DOCUMENT (F/P)<br>: F                                                                                                                           |
| EP0566699 A1 | 19981030 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                         | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST                                                                                                                                                   |

|                 |          |      |       |                                                                                       |                                                                                                                                                                                                              |
|-----------------|----------|------|-------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP0566699 A1    | 20000501 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : DK<br>REF LEGAL EVENT CODE : EBP                                                                                                                                                          |
| EP0566699 A1    | 20011101 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FD2A<br>EFFECTIVE DATE : 20010910                                                                                                                            |
| EP0566699 A1    | 20050116 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : IT<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20050116                                                                                                 |
| EP0566699 B1    | 19970723 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                              |
| EP0566699 B1    | 20120116 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                                              |
| ES2106863 T3    | 19971116 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                              |
| ES2106863 T3    | 19971116 | LSGT | +FG2A | DEFINITIVE PROTECTION                                                                 | REF DOCUMENT NUMBER : 566699<br>COUNTRY OF REF DOCUMENT : ES                                                                                                                                                 |
| ES2106863 T3    | 20120116 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                                              |
| JP6500524 T2    | 19940120 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                                              |
| KR19937002219 A | 19930908 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                                              |
| MX9200221 A1    | 19930801 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                                              |
| MX9200221 A1    | 19960202 | LSGT | +FG   | GRANT OR REGISTRATION                                                                 |                                                                                                                                                                                                              |
| MX9200221 A1    | 20041231 | LSAS | GB    | TRANSFER OR ASSIGNMENT                                                                |                                                                                                                                                                                                              |
| MX9200221 A1    | 20041231 | LSAS | PD    | CHANGE OF PROPRIETORSHIP                                                              | OWNER NAME : DELAWARE CAPITAL FORMATION, INC..                                                                                                                                                               |
| MX9200221 A1    | 20140131 | LSLE | -MM   | ANNULMENT OR LAPSE DUE TO NON-PAYMENT OF FEES                                         |                                                                                                                                                                                                              |
| US5096159 A     | 19920317 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                              |
| US5096159 A     | 19920608 | LSAS | AS    | ASSIGNMENT                                                                            | OWNER NAME : ADVANTAGE LIFT SYSTEMS, INC., A CORP. OF CA, CALIF<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.;<br>ASSIGNOR:FLETCHER, ROBERT H.; REEL/FRAME:006158/0343<br>EFFECTIVE DATE : 19920519     |
| US5096159 A     | 19960317 | LSRE | +REIN | REINSTATEMENT AFTER MAINTENANCE FEE PAYMENT CONFIRMED                                 |                                                                                                                                                                                                              |
| US5096159 A     | 19960528 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                                         | EFFECTIVE DATE : 19960320                                                                                                                                                                                    |
| US5096159 A     | 19970515 | LSFE | +FPAY | FEE PAYMENT                                                                           | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                      |
| US5096159 A     | 19970610 | LSGT | PAT1  | Patented Case                                                                         |                                                                                                                                                                                                              |
| US5096159 A     | 19970812 | LSRE | +PRDP | PATENT REINSTATED DUE TO THE ACCEPTANCE OF A LATE MAINTENANCE FEE                     | EFFECTIVE DATE : 19970606                                                                                                                                                                                    |
| US5096159 A     | 19980520 | LSAS | AS    | ASSIGNMENT                                                                            | OWNER NAME : IMPERIAL BANK, CALIFORNIA<br>DESCRIPTION : MORTGAGE, ASSIGNMENT AND GRANT OF SECURITY INTERES;<br>ASSIGNOR:ADVANTAGE LIFT SYSTEMS, INC.;<br>REEL/FRAME:009267/0326<br>EFFECTIVE DATE : 19980406 |

|             |          |      |       |                                      |                                                                                                                                                                                                                                                                                                                                |
|-------------|----------|------|-------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US5096159 A | 19990802 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : ROTARY LIFT, INDIANA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:ADVANTAGE LIFT SYSTEMS, INC.;<br>REEL/FRAME:010133/0180<br>EFFECTIVE DATE : 19990723                                                                                                                                          |
| US5096159 A | 19990830 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : DELAWARE CAPITAL FORMATION, INC., DELAWARE<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:LIFT, ROTARY;<br>REEL/FRAME:010197/0533<br>EFFECTIVE DATE : 19990824                                                                                                                                    |
| US5096159 A | 19991129 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                                                                                        |
| US5096159 A | 20011114 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : DELAWARE CAPITAL FORMATION, INC., A CORP. OF DELAW<br>DESCRIPTION : DOCUMENT PREVIOUSLY RECORDED AT REEL 010197 FRAME 0533 CONTAINED AN ERROR IN PROPERTY NUMBER 5,096,169. DOCUMENT RERECORDED TO CORRECT ERROR ON STATED REEL.;<br>ASSIGNOR:ROTARY LIFT;<br>REEL/FRAME:012312/0329<br>EFFECTIVE DATE : 19990824 |
| US5096159 A | 20030923 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                                                                                                                       |
| US5096159 A | 20080403 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : ROTARY LIFT COMPANY, INDIANA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:CP FORMATION LLC;<br>REEL/FRAME:020741/0700<br>EFFECTIVE DATE : 20080101                                                                                                                                              |
| US5096159 A | 20080403 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : CLOVE PARK INSURANCE COMPANY, NEW YORK<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:DELAWARE CAPITAL FORMATION, INC.;<br>REEL/FRAME:020741/0676<br>EFFECTIVE DATE : 20071231                                                                                                                    |
| US5096159 A | 20080403 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : CP FORMATION LLC, NEW YORK<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:CLOVE PARK INSURANCE COMPANY;<br>REEL/FRAME:020741/0693<br>EFFECTIVE DATE : 20071231                                                                                                                                    |
| US5096159 A | 20110118 | PEXP |       | Calculated Patent Term Expiry        |                                                                                                                                                                                                                                                                                                                                |
| US5199686 A | 19930406 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                                                                                                                                |
| US5199686 A | 19920615 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : ADVANTAGE LIFT SYSTEMS, INC., A CORP. OF CA, CALIF<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.;<br>ASSIGNOR:FLETCHER, ROBERT H.; REEL/FRAME:006149/0559<br>EFFECTIVE DATE : 19920519                                                                                                                       |
| US5199686 A | 19930326 | LSGT | PAT1  | Patented Case                        |                                                                                                                                                                                                                                                                                                                                |
| US5199686 A | 19970403 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                                                                                        |
| US5199686 A | 19980520 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : IMPERIAL BANK, CALIFORNIA<br>DESCRIPTION : MORTGAGE, ASSIGNMENT AND GRANT OF SECURITY INTERES;<br>ASSIGNOR:ADVANTAGE LIFT SYSTEMS, INC.;<br>REEL/FRAME:009267/0326<br>EFFECTIVE DATE : 19980406                                                                                                                   |
| US5199686 A | 19990802 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : ROTARY LIFT, INDIANA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:ADVANTAGE LIFT SYSTEMS, INC.;                                                                                                                                                                                                 |

|              |          |      |       |                                                         |                                                                                                                                                                                                                      |
|--------------|----------|------|-------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       |                                                         | REEL/FRAME:010133/0180<br>EFFECTIVE DATE : 19990723                                                                                                                                                                  |
| US5199686 A  | 19990830 | LSAS | AS    | ASSIGNMENT                                              | OWNER NAME : DELAWARE<br>CAPITAL FORMATION, INC.,<br>DELAWARE<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:LIFT, ROTARY;<br>REEL/FRAME:010197/0533<br>EFFECTIVE DATE : 19990824                 |
| US5199686 A  | 20000919 | LSFE | +FPAY | FEE PAYMENT                                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                              |
| US5199686 A  | 20041006 | LSFE | +FPAY | FEE PAYMENT                                             | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                             |
| US5199686 A  | 20080403 | LSAS | AS    | ASSIGNMENT                                              | OWNER NAME : ROTARY LIFT<br>COMPANY, INDIANA<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:CP FORMATION LLC;<br>REEL/FRAME:020741/0700<br>EFFECTIVE DATE : 20080101                              |
| US5199686 A  | 20080403 | LSAS | AS    | ASSIGNMENT                                              | OWNER NAME : CLOVE PARK<br>INSURANCE COMPANY, NEW YORK<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:DELAWARE CAPITAL<br>FORMATION, INC.;<br>REEL/FRAME:020741/0676<br>EFFECTIVE DATE : 20071231 |
| US5199686 A  | 20080403 | LSAS | AS    | ASSIGNMENT                                              | OWNER NAME : CP FORMATION<br>LLC, NEW YORK<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:CLOVE PARK<br>INSURANCE COMPANY;<br>REEL/FRAME:020741/0693<br>EFFECTIVE DATE : 20071231                 |
| US5199686 A  | 20120102 | PEXP |       | Calculated Patent<br>Term Expiry                        |                                                                                                                                                                                                                      |
| WO9212924 A1 | 19920806 | LSPB | +     | published /<br>reissued                                 |                                                                                                                                                                                                                      |
| WO9212924 A1 | 19930705 | LSNP | ENP   | ENTRY INTO THE<br>NATIONAL PHASE<br>IN:                 | REF COUNTRY CODE : CA<br>REF DOCUMENT NUMBER :<br>2099878<br>KIND CODE OF REF DOCUMENT : A<br>FORMAT OF REF DOCUMENT (F/P)<br>: F                                                                                    |
| WO9212924 A1 | 19930705 | LSNP | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE    | REF DOCUMENT NUMBER :<br>2099878<br>COUNTRY OF REF DOCUMENT : CA                                                                                                                                                     |
| WO9212924 A1 | 19930713 | LSNP | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE    | REF DOCUMENT NUMBER :<br>1992909139<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                  |
| WO9212924 A1 | 19931027 | LSPB | +WWP  | WIPO<br>INFORMATION:<br>PUBLISHED IN<br>NATIONAL OFFICE | REF DOCUMENT NUMBER :<br>1992909139<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                  |
| WO9212924 A1 | 19970723 | LSGT | +WWG  | WIPO<br>INFORMATION:<br>GRANT IN<br>NATIONAL OFFICE     | REF DOCUMENT NUMBER :<br>1992909139<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                  |

**Title:** ELECTROHYDRAULIC BRAKE SYSTEM FOR MOTOR VEHICLES

**Abstract:** Source: US2006186733A Disclosed is a brake system which can be operated in three modes of operation, a non-boosted mode of operation, a hydraulic-booster mode of operation, and an electronically **controlled** mode of operation. The brake system includes a master cylinder (1), a first piston (2) coupled to a brake pedal (3), a second piston (4) actuating the master cylinder (1), and a third piston (5) actuated by the first piston (2), with at least one elastic element (6, 7) being provided between the first and the third piston (5), and all three pistons (2, 4, 5) are arranged in a **housing** (8). Further, there is provision of a hydraulic pressure source (9) and a **valve** device (10) for reducing the pressure of the pressure source (9) to a value of pressure that is fed into a space (11) by which the second piston (4) and the third piston (5) are separated from each other in such a fashion that the third piston (5) is acted upon by the pressure acting upon the second piston (4) in the direction being opposite to the direction of application of the second piston (4). A device (29 - 31, 45) which, by way of a variation of the pressure fluid volume in the hydraulic chamber (21) **controlled** by electromagnetic **valve**, allows a pedal performance which differs from the brake pedal characteristics that is predefined by the brake pedal characteristics simulation device.

**Classifications:**

**International (IPC 8-9):** B60T13/14 B60T7/04 B60T8/17 B60T8/1761 B60T8/32 B60T8/40 B60T8/44 B60T8/48 (Advanced/Invention); B60T13/10 B60T7/04 B60T8/32 B60T8/40 B60T8/48 (Core/Invention)

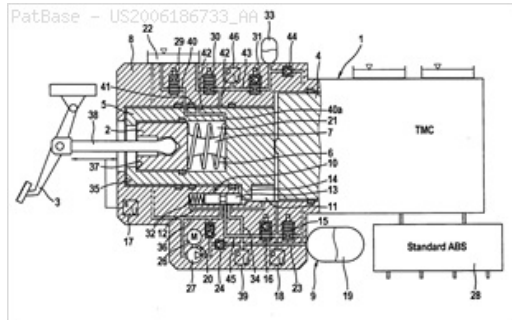
**International (IPC 1-7):** B60T13/12 B60T13/66 B60T8/40

**CPC:** B60T7/042 B60T8/3275 B60T8/4077 B60T8/4845 B60T13/142

**European:** B60T13/14B B60T7/04B B60T8/32D14D B60T8/40J2

B60T8/48B4B

**US:** 303/114.1 303/114.100P



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE10346674 A1      | 20050127         | DE20031046674      | 20031008         |
| DE502004005089 D1  | 20071108         | DE200450005089T    | 20040712         |
| EP1646543 A1       | 20060419         | EP20040766198      | 20040712         |
| EP1646543 B1       | 20070926         | EP20040766198      | 20040712         |
| JP2009513412 T2    | 20090402         | JP20060518231T     | 20040712         |
| US2006186733 AA    | 20060824         | US20040564334      | 20040712         |
| WO05007476 A1      | 20050127         | WO2004EP51466      | 20040712         |

**Priority:**

DE20031031784 20030711 DE20031046674 20031008 WO2004EP51466 20040712

**Probable Assignee:** CONTINENTAL TEVES AND CO OHG AG

**Assignee(s):** (std): CONTINENTAL TEVES AG AND CO OHG ; CONTINENTAL TEVES AND CO OHG AG ; CONTINENTAL TEVES AG AND CO OHG ; CONTINENTAL TEVES AND CO OHG AG ; DRUMM STEFAN A

**Assignee(s):** CONTINENTAL TEVES AG

**Inventor(s):** (std): DRUMM STEFAN A

**Agent(s):** CONTINENTAL TEVES INC

**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NA NE NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code  | Event                                                                   | Details                   |
|-------------------|---------------|-------------|-------|-------------------------------------------------------------------------|---------------------------|
| DE10346674 A1     | 20050127      | LSPB        | +     | published / reissued                                                    |                           |
| DE10346674 A1     | 20050127      | LSES        | +OM8  | SEARCH REPORT AVAILABLE AS TO PARAGRAPH 43 LIT. 1 SENTENCE 1 PATENT LAW |                           |
| DE10346674 A1     | 20090820      | LSLE        | -8139 | DISPOSAL/NON-PAYMENT OF THE ANNUAL FEE                                  |                           |
| DE502004005089 D1 | 20081016      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                 |                           |
| EP1646543 A1      | 20060419      | LSPB        | +     | published / reissued                                                    |                           |
| EP1646543 A1      | 20060419      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                                           | EFFECTIVE DATE : 20060213 |
| EP1646543 A1      | 20061011      | LSES        | +17Q  | FIRST EXAMINATION REPORT                                                | EFFECTIVE DATE : 20060911 |
| EP1646543 A1      | 20080903      | LSGT        | +26N  | NO OPPOSITION FILED                                                     | EFFECTIVE DATE : 20080627 |

|                 |          |      |       |                                                                                       |                                                                                                              |
|-----------------|----------|------|-------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| EP1646543 A1    | 20091030 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : FR<br>PAYMENT DATE : 20090722<br>YEAR OF FEE PAYMENT : 06                                 |
| EP1646543 A1    | 20091130 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20090731<br>YEAR OF FEE PAYMENT : 06                                 |
| EP1646543 A1    | 20101130 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20100731<br>YEAR OF FEE PAYMENT : 07                                 |
| EP1646543 A1    | 20110422 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST<br>EFFECTIVE DATE : 20110331                              |
| EP1646543 A1    | 20110531 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : FR<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20100802 |
| EP1646543 A1    | 20111130 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20110731<br>YEAR OF FEE PAYMENT : 08                                 |
| EP1646543 A1    | 20121231 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20120731<br>YEAR OF FEE PAYMENT : 09                                 |
| EP1646543 A1    | 20121231 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20120731<br>YEAR OF FEE PAYMENT : 09                                 |
| EP1646543 A1    | 20131031 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20130731<br>YEAR OF FEE PAYMENT : 10                                 |
| EP1646543 A1    | 20141031 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20140731<br>YEAR OF FEE PAYMENT : 11                                 |
| EP1646543 A1    | 20151030 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20150731<br>YEAR OF FEE PAYMENT : 12                                 |
| EP1646543 A1    | 20161031 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20160731<br>YEAR OF FEE PAYMENT : 13                                 |
| EP1646543 B1    | 20070926 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                              |
| EP1646543 B1    | 20240712 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                              |
| JP2009513412 T2 | 20090402 | LSPB | +     | published / reissued                                                                  |                                                                                                              |
| JP2009513412 T2 | 20100223 | LSWD | -A761 | WRITTEN WITHDRAWAL OF APPLICATION                                                     | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A761<br>EFFECTIVE DATE : 20100222                                  |
| JP2009513412 T2 | 20100223 | LSWD | -A761 | WRITTEN WITHDRAWAL OF APPLICATION                                                     | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A761<br>EFFECTIVE DATE : 20100222                                  |

|                 |          |      |       |                                                           |                                                                                                                                                                                                                |
|-----------------|----------|------|-------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2006186733 AA | 20060824 | LSPB | +     | published / reissued                                      |                                                                                                                                                                                                                |
| US2006186733 AA | 20060111 | LSAS | AS    | ASSIGNMENT                                                | OWNER NAME :<br>CONTINENTAL TEVES AG<br>AND CO., OHG, GERMANY<br>DESCRIPTION :<br>ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:DRUMM,<br>STEFAN;<br>REEL/FRAME:017469/0569<br>EFFECTIVE DATE :<br>20051215 |
| US2006186733 AA | 20080930 | LSWD | -ABD3 | Abandoned -- Failure to<br>Respond to an Office<br>Action |                                                                                                                                                                                                                |
| WO05007476 A1   | 20050127 | LSPB | +     | published / reissued                                      |                                                                                                                                                                                                                |
| WO05007476 A1   | 20060105 | LSNP | +WWE  | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE         | REF DOCUMENT NUMBER :<br>2004766198<br>COUNTRY OF REF<br>DOCUMENT : EP                                                                                                                                         |
| WO05007476 A1   | 20060110 | LSNP | +WWE  | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE         | REF DOCUMENT NUMBER :<br>2006518231<br>COUNTRY OF REF<br>DOCUMENT : JP                                                                                                                                         |
| WO05007476 A1   | 20060111 | LSNP | +WWE  | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE         | REF DOCUMENT NUMBER :<br>2006186733<br>COUNTRY OF REF<br>DOCUMENT : US                                                                                                                                         |
| WO05007476 A1   | 20060111 | LSNP | +WWE  | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE         | REF DOCUMENT NUMBER :<br>10564334<br>COUNTRY OF REF<br>DOCUMENT : US                                                                                                                                           |
| WO05007476 A1   | 20060419 | LSPB | +WWP  | WIPO INFORMATION:<br>PUBLISHED IN<br>NATIONAL OFFICE      | REF DOCUMENT NUMBER :<br>2004766198<br>COUNTRY OF REF<br>DOCUMENT : EP                                                                                                                                         |
| WO05007476 A1   | 20060824 | LSPB | +WWP  | WIPO INFORMATION:<br>PUBLISHED IN<br>NATIONAL OFFICE      | REF DOCUMENT NUMBER :<br>10564334<br>COUNTRY OF REF<br>DOCUMENT : US                                                                                                                                           |
| WO05007476 A1   | 20070926 | LSGT | +WWG  | WIPO INFORMATION:<br>GRANT IN NATIONAL<br>OFFICE          | REF DOCUMENT NUMBER :<br>2004766198<br>COUNTRY OF REF<br>DOCUMENT : EP                                                                                                                                         |

**Title:** Intraurethral continent prosthesis

**Abstract:** Source: US6638208B An implantable apparatus may include a plug member having a lumen and a **valve** adapted to open and close the lumen in response to a signal. The apparatus may also include at least one sensor and a **controller** adapted to **control** the **valve**. The **controller** may be programmable to open the **valve** to permit the flow of urine under at least one mode of operation selected from a predetermined time interval operation, a sensor operation, and a manual actuation operation.

**Classifications:**

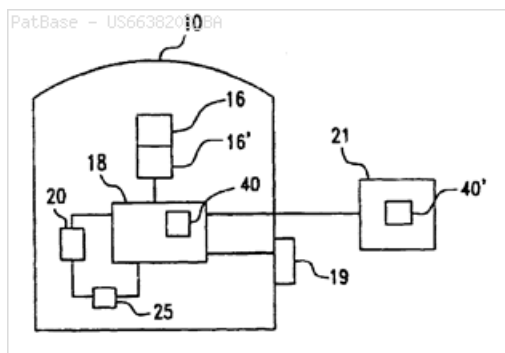
**International (IPC 8-9):** A61F2/00 (Advanced/Invention)

**International (IPC 1-7):** A61B5/00 A61F2/00

**CPC:** A61F2/0004 A61F2/0022

**European:** A61F2/00B4 K61F2/00B

**US:** 600/30



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU199959093 A1     | 20000403         | AU19990059093      | 19990904         |
| AU199959093 A5     | 20000403         | AU19990059093      | 19990904         |
| US6638208 BA       | 20031028         | US19990391077      | 19990904         |
| WO0015140 A1       | 20000323         | WO1999US20377      | 19990904         |

**Priority:**

US19980100396P 19980915      US19990391077 19990904      WO1999US20377 19990904

**Probable Assignee:** INFINITE BIOMEDICAL TECHNOLOGIES LLC

**Assignee(s):** (std): INFINITE BIOMEDICAL TECHNOLOGI ; NATARAJAN ANANTH ; THAKOR NITISH V

**Assignee(s):** INFINITE BIOMEDICAL TECHNOLOGIES INC ; INFINITE BIOMEDICAL TECHNOLOGIES LLC

**Inventor(s):** (std): THAKOR NITISH V ; NATARAJAN ANANTH

**Inventor(s):** ANANTH NATARAJAN ; NITISH V THAKOR

**Designated states:** AE AL AM AT AU AZ BA BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CU CY CZ DE DK EE ES FI FR GA GB GD GE GH GM GN GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT UA UG US UZ VN YU ZA ZW

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent         | Date recorded | Event group | Code | Event                                                                                       | Details                                                                                                                                                                                                                   |
|----------------|---------------|-------------|------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AU199959093 A1 | 20010614      | LSLE        | -MK6 | APPLICATION LAPSED SECTION 142(2) (F)/REG. 8.3(3) - PCT APPLIC. NOT ENTERING NATIONAL PHASE |                                                                                                                                                                                                                           |
| US6638208 BA   | 20031028      | LSGT        | +    | granted / extensions (spc, cpc, pte)                                                        |                                                                                                                                                                                                                           |
| US6638208 BA   | 20020916      | LSAS        | AS   | ASSIGNMENT                                                                                  | OWNER NAME : INFINITE BIOMEDICAL TECHNOLOGIES, INC., FLORIDA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:NATARAJAN, ANANTH; THAKOR, NITISH V.;<br>REEL/FRAME:013289/0445<br>EFFECTIVE DATE : 20020911 |
| US6638208 BA   | 20020916      | LSAS        | AS   | ASSIGNMENT                                                                                  | OWNER NAME : INFINITE BIOMEDICAL TECHNOLOGIES, INC., FLORIDA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:NATARAJAN, ANANTH; THAKOR, NITISH V.;<br>REEL/FRAME:013289/0450<br>EFFECTIVE DATE : 19990903 |
| US6638208 BA   | 20020917      | LSAS        | AS   | ASSIGNMENT                                                                                  | OWNER NAME : INFINITE BIOMEDICAL TECHNOLOGIES, LLC, MARYLAND<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:INFINITE BIOMEDICAL TECHNOLOGIES, INC.;                                                       |

|              |          |      |       |                                                                         |                                                      |
|--------------|----------|------|-------|-------------------------------------------------------------------------|------------------------------------------------------|
| US6638208 BA | 20070223 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                              |
| US6638208 BA | 20111028 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                                                      |
| US6638208 BA | 20111128 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                      |
| US6638208 BA | 20111220 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20111028                            |
| US6638208 BA | 20190904 | PEXP |       | Calculated Patent Term Expiry                                           |                                                      |
| WO0015140 A1 | 20000323 | LSPB | +     | published / reissued                                                    |                                                      |
| WO0015140 A1 | 20010719 | LSWD | REG   | REFERENCE TO NATIONAL CODE                                              | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : 8642 |

**Title:** Loading device for continuously variable transmission

**Abstract:** Source: US5330396A A compact structure is provided for an continuously variable transmission, which provides a more direct application of both load and **control** forces at the pivot trunnion. Load forces are produced from within the pivot trunnion, providing more direct **control** over load forces and their effect on contact forces between traction rollers and toric discs. **Control** forces which establish the desired transmission ratio are applied to the pivot trunnion in a manner which substantially eliminates twisting and squirming of the support rollers. High efficiency in operation, and improved assembly is provided with the compact structure disclosed.

**Classifications:**

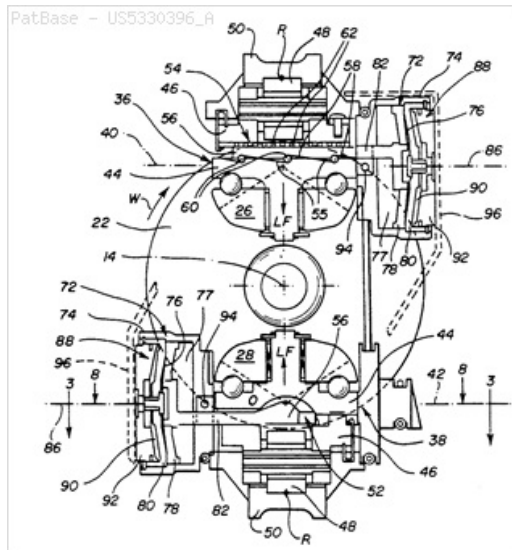
**International (IPC 8-9):** F16H15/38 F16H61/662 (Advanced/Invention);  
F16H15/32 F16H61/66 (Core/Invention)

**International (IPC 1-7):** F16H15/08

**CPC:** F16H15/38 F16H61/6649 F16H2015/383

**European:** F16H15/38 F16H61/664K R16H15/38P

**US:** 476/10 476/40 476/41 476/42 476/46



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU199457343 A1     | 19940704         | AU19940057343      | 19931201         |
| US5330396 A        | 19940719         | US19920991321      | 19921216         |
| US5417620 A        | 19950523         | US19940202500      | 19940228         |
| US5540631 A        | 19960730         | US19940319669      | 19941007         |
| WO9413978 A1       | 19940623         | WO1993US11647      | 19931201         |

**Priority:**

US19920991321 19921216      US19940202500 19940228      WO1993US11647 19931201  
US19940319669 19941007

**Probable Assignee:** TORAX CO INC

**Assignee(s):** (std): TORAX CO INC

**Assignee(s):** THE TORAX COMPANY INC

**Inventor(s):** (std): HEIDEMANN WILLIAM J ; LOHR CHARLES B ; LOHR III CHARLES B

**Inventor(s):** WILLIAM J HEIDEMANN ; CHARLES B LOHR

**Designated states:** AT AU BE CA CH DE DK ES FR GB GR IE IT JP LU MC NL PT SE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent      | Date recorded | Event group | Code  | Event                                         | Details                                                                                                                                                                                                         |
|-------------|---------------|-------------|-------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US5330396 A | 19940719      | LSGT        | +     | granted / extensions (spc, cpc, pte)          |                                                                                                                                                                                                                 |
| US5330396 A | 19930128      | LSAS        | AS    | ASSIGNMENT                                    | OWNER NAME : TORAX COMPANY, INC., THE, OHIO<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.;<br>ASSIGNORS:LOHR, CHARLES B.;<br>HEIDEMANN, WILLIAM J.;<br>REEL/FRAME:006401/0782<br>EFFECTIVE DATE : 19921216 |
| US5330396 A | 19940708      | LSGT        | PAT1  | Patented Case                                 |                                                                                                                                                                                                                 |
| US5330396 A | 19980719      | LSLE        | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES     |                                                                                                                                                                                                                 |
| US5330396 A | 19980929      | LSLE        | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE | EFFECTIVE DATE : 19980722                                                                                                                                                                                       |

|              |          |      |       |                                                           |                                                                                                                                                                                                                                   |
|--------------|----------|------|-------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US5330396 A  | 20121216 | PEXP |       | Calculated<br>Patent Term<br>Expiry                       |                                                                                                                                                                                                                                   |
| US5417620 A  | 19950523 | LSGT | +     | granted /<br>extensions<br>(spc, cpc,<br>pte)             |                                                                                                                                                                                                                                   |
| US5417620 A  | 19950512 | LSGT | PAT1  | Patented<br>Case                                          |                                                                                                                                                                                                                                   |
| US5417620 A  | 19990523 | LSLE | -LAPS | LAPSE FOR<br>FAILURE TO<br>PAY<br>MAINTENANCE<br>FEES     |                                                                                                                                                                                                                                   |
| US5417620 A  | 19990720 | LSLE | -FP   | EXPIRED DUE<br>TO FAILURE<br>TO PAY<br>MAINTENANCE<br>FEE | EFFECTIVE DATE : 19990523                                                                                                                                                                                                         |
| US5417620 A  | 20140228 | PEXP |       | Calculated<br>Patent Term<br>Expiry                       |                                                                                                                                                                                                                                   |
| US5540631 A  | 19960730 | LSGT | +     | granted /<br>extensions<br>(spc, cpc,<br>pte)             |                                                                                                                                                                                                                                   |
| US5540631 A  | 19941206 | LSAS | AS    | ASSIGNMENT                                                | OWNER NAME : TORAX COMPANY, INC.,<br>THE, OHIO<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST; ASSIGNORS:LOHR,<br>CHARLES BORROMEO, III; HEIDEMANN,<br>WILLIAM JOHN;<br>REEL/FRAME:007236/0352<br>EFFECTIVE DATE : 19940915 |
| US5540631 A  | 19960624 | LSGT | PAT1  | Patented<br>Case                                          |                                                                                                                                                                                                                                   |
| US5540631 A  | 20000730 | LSLE | -LAPS | LAPSE FOR<br>FAILURE TO<br>PAY<br>MAINTENANCE<br>FEES     |                                                                                                                                                                                                                                   |
| US5540631 A  | 20001003 | LSLE | -FP   | EXPIRED DUE<br>TO FAILURE<br>TO PAY<br>MAINTENANCE<br>FEE | EFFECTIVE DATE : 20000730                                                                                                                                                                                                         |
| US5540631 A  | 20141007 | PEXP |       | Calculated<br>Patent Term<br>Expiry                       |                                                                                                                                                                                                                                   |
| WO9413978 A1 | 19940623 | LSPB | +     | published /<br>reissued                                   |                                                                                                                                                                                                                                   |
| WO9413978 A1 | 19960816 | LSNE | NENP  | NON-ENTRY<br>INTO THE<br>NATIONAL<br>PHASE IN:            | REF COUNTRY CODE : CA                                                                                                                                                                                                             |

**Title:** MULTI-WAY **VALVE**

**Abstract:** Source: US4850394A A **two-way control valve** includes a **valve** member with a longitudinal bore connecting its opposite ends with each other. A **housing** receives the movable **valve** member and has two attachment ports. A **control** piston is operatively coupled with the **valve** member. To provide a **two-way valve** permitting pressure medium to flow in both directions when the **valve** member is moved from its closed position, the **control** piston is tightly or fixedly connected with the **valve** member and is arranged as an annular collar on the periphery of the **valve** member. The longitudinal bore is free of constrictions.

**Classifications:**

**International (IPC 8-9):** F16K11/04 F16K31/12

F16K31/122 (Advanced/Invention);

F16K11/02 F16K31/12 F16K31/122 (Core/Invention)

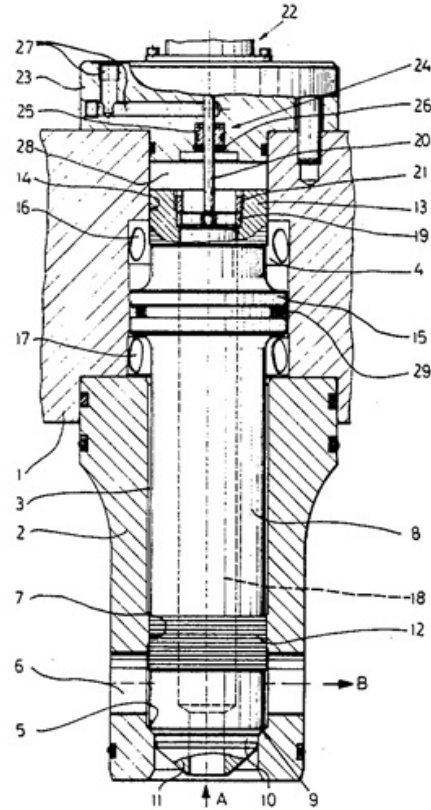
**International (IPC 1-7):** F15B13/02 F15B13/042 F16K31/122 F16K37/00

**CPC:** Y10T137/8242 F16K11/04

**European:** F16K11/04

**US:** 137/554 251/282 251/63 251/63.5

PatBase - US4850394\_A



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE3420400 A1       | 19851205         | DE19843420400      | 19840601         |
| DE3420400 C2       | 19900830         | DE19843420400      | 19840601         |
| JP1768256 C3       | 19930611         | JP19850119638      | 19850531         |
| JP4054111 B4       | 19920828         | JP19850119638      | 19850531         |
| JP60263787 A2      | 19851227         | JP19850119638      | 19850531         |
| US4850394 A        | 19890725         | US19850739211      | 19850530         |

**Priority:**

DE19843420400 19840601

**Probable Assignee:** REXROTH MANNESMANN GMBH

**Assignee(s):** (std): REXROTH MANNESMANN GMBH

**Assignee(s):** MANNESMANN REXROTH GMBH ; MANNESMANN REXROTH GMBH 8770 LOHR DE ; MANNESUMAN REKUSUROOTO GMBH

**Inventor(s):** (std): BORUFUGANGU RUUKASUTSUIKU ; IMHOF RAINER ; LUKASCZYK WOLFGANG ; RAINAA IMUHOFU

**Inventor(s):** LUKASCZYK WOLFGANG 8770 LOHR DE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                                 | Details |
|--------------|---------------|-------------|-------|-------------------------------------------------------|---------|
| DE3420400 A1 | 19851205      | LSPB        | +     | published / reissued                                  |         |
| DE3420400 A1 | 19851205      | LSSES       | +OP8  | REQUEST FOR EXAMINATION AS TO PARAGRAPH 44 PATENT LAW |         |
| DE3420400 A1 | 19900830      | LSGT        | +D2   | GRANT AFTER EXAMINATION                               |         |
| DE3420400 A1 | 19910307      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION               |         |

|               |          |      |       |                                                       |                                                                                                                                                                                                                               |
|---------------|----------|------|-------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DE3420400 A1  | 19981210 | LSAS | 8327  | CHANGE IN THE PERSON/NAME/ADDRESS OF THE PATENT OWNER | OWNER NAME : MANNESMANN REXROTH AG, 97816 LOHR, DE                                                                                                                                                                            |
| DE3420400 A1  | 20020926 | LSLE | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                  |                                                                                                                                                                                                                               |
| DE3420400 C2  | 19900830 | LSGT | +     | granted / extensions (spc, cpc, pte)                  |                                                                                                                                                                                                                               |
| JP1768256 C3  | 19930611 | LSGT | +     | granted / extensions (spc, cpc, pte)                  |                                                                                                                                                                                                                               |
| JP1768256 C3  | 20050531 | PEXP |       | Calculated Patent Term Expiry                         |                                                                                                                                                                                                                               |
| JP4054111 B4  | 19920828 | LSPB | +     | published / reissued                                  |                                                                                                                                                                                                                               |
| JP60263787 A2 | 19851227 | LSPB | +     | published / reissued                                  |                                                                                                                                                                                                                               |
| US4850394 A   | 19890725 | LSGT | +     | granted / extensions (spc, cpc, pte)                  |                                                                                                                                                                                                                               |
| US4850394 A   | 19850628 | LSAS | AS    | ASSIGNMENT                                            | OWNER NAME : MANNESMANN REXROTH GMBH POSTFACH 3 40, D-8770 LOH<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.;<br>ASSIGNORS:IMHOF, RAINER;<br>LUKASCZYK, WOLFGANG;<br>REEL/FRAME:004426/0110<br>EFFECTIVE DATE : 19850614 |
| US4850394 A   | 19890609 | LSGT | PAT1  | Patented Case                                         |                                                                                                                                                                                                                               |
| US4850394 A   | 19921221 | LSFE | +FPAY | FEE PAYMENT                                           | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                       |
| US4850394 A   | 19961224 | LSFE | +FPAY | FEE PAYMENT                                           | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                       |
| US4850394 A   | 20010722 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES             |                                                                                                                                                                                                                               |
| US4850394 A   | 20010925 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE         | EFFECTIVE DATE : 20010725                                                                                                                                                                                                     |

**Title:** Pneumatic-hydraulic brake system for vehicles

**Abstract:** Source: US4192557A A pneumatic-hydraulic brake system for vehicles having at least one pressure modulator used to supply a group of hydraulic wheel cylinders in combination with an anti-locking device. The pressure modulator is included in both the pneumatic and the hydraulic circuits of the system. For effecting anti-locking pressure modulation, at least one multiple-position air **valve** is included in the pneumatic circuit and at least one hydraulic **valve** in the hydraulic circuit.

**Classifications:**

**International (IPC 8-9):** B60T13/44 B60T13/58 B60T17/22 B60T8/1761 B60T8/34 B60T8/42 B60T8/44

B60T8/46 (Advanced/Invention);

B60T13/10 B60T13/24 B60T17/18 B60T8/34

B60T8/42 (Core/Invention)

**International (IPC 1-7):** B60T13/10 B60T13/26 B60T13/66

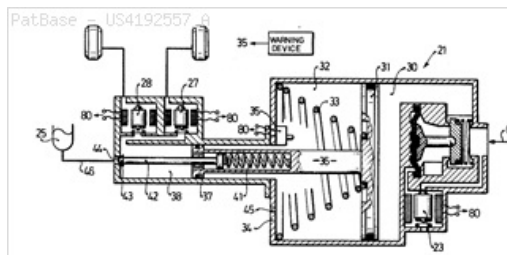
B60T13/68 B60T8/02 B60T8/04 B60T8/34

**CPC:** B60T8/4241 B60T8/46 B60T13/44 B60T13/581 B60T17/22

**European:** B60T13/44 B60T13/58B B60T17/22 B60T8/42A4B

B60T8/46

**US:** 188/181A 303/114 303/114.3



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE2726640 A1       | 19781221         | DE19772726640      | 19770614         |
| DE2751143 A1       | 19790517         | DE19772751143      | 19771116         |
| FR2401046 A1       | 19790323         | FR19780017817      | 19780614         |
| FR2401046 B1       | 19830401         | FR19780017817      | 19780614         |
| FR2409176 A2       | 19790615         | FR19780032399      | 19781116         |
| FR2409176 B2       | 19831202         | FR19780032399      | 19781116         |
| GB1602246 A        | 19811111         | GB19780018609      | 19780510         |
| IT1100237 A        | 19850928         | IT19780029791      | 19781115         |
| IT7829791 A0       | 19781115         | IT19780029791      | 19781115         |
| JP1038702 B4       | 19890816         | JP19780140534      | 19781116         |
| JP1558936 C3       | 19900516         | JP19780140534      | 19781116         |
| JP54079369 A2      | 19790625         | JP19780140534      | 19781116         |
| SE437358 B         | 19850225         | SE19780006137      | 19780529         |
| SE437358 C         | 19850613         | SE19780006137      | 19780529         |
| SE7806137 A        | 19781215         | SE19780006137D     | 19780529         |
| US4192557 A        | 19800311         | US19780914632      | 19780612         |

**Priority:**

DE19772726640 19770614 DE19772751143 19771116

**Probable Assignee:** BOSCH GMBH ROBERT

**Assignee(s):** (std): BOSCH GMBH ROBERT

**Assignee(s):** BOSCH ROBERT GMBH ; ROBERT BOSCH GMBH

**Inventor(s):** (std): BUERUNERU SHIYOUTOUMUPE ; LEIBER H ; LEIBER HEINZ ; LEIBER HEINZ ING GRAD ; STUMPE WERNER

**Inventor(s):** UERUNERU SHUTOMUPE ; LEIBER HEINZ ING ; H LEIBER

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                            | Details |
|--------------|---------------|-------------|-------|--------------------------------------------------|---------|
| DE2726640 A1 | 19781221      | LSPB        | +     | published / reissued                             |         |
| DE2726640 A1 | 19831020      | LSSES       | +8110 | REQUEST FOR EXAMINATION PARAGRAPH 44             |         |
| DE2726640 A1 | 19860528      | LSRV        | -8131 | REJECTION                                        |         |
| DE2751143 A1 | 19790517      | LSPB        | +     | published / reissued                             |         |
| DE2751143 A1 | 19841025      | LSSES       | +8110 | REQUEST FOR EXAMINATION PARAGRAPH 44             |         |
| DE2751143 A1 | 19881117      | LSRV        | -8131 | REJECTION                                        |         |
| FR2401046 A1 | 19790323      | LSPB        | +     | published / reissued                             |         |
| FR2401046 A1 | 19870424      | LSLE        | -ST   | NOTIFICATION OF LAPSE                            |         |
| FR2401046 B1 | 19830401      | LSGT        | +     | granted / extensions (spc, cpc, pte)             |         |
| FR2401046 B1 | 19980614      | PEXP        |       | Calculated Patent Term Expiry                    |         |
| GB1602246 A  | 19811111      | LSGT        | +     | granted / extensions (spc, cpc, pte)             |         |
| GB1602246 A  | 19820203      | LSGT        | +PS   | PATENT SEALED                                    |         |
| GB1602246 A  | 19861231      | LSLE        | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE |         |
| GB1602246 A  | 19980510      | PEXP        |       | Calculated Patent Term Expiry                    |         |
| IT1100237 A  | 19850928      | LSGT        | +     | granted / extensions (spc, cpc, pte)             |         |
| IT1100237 A  | 19981115      | PEXP        |       | Calculated Patent Term Expiry                    |         |
| JP1038702 B4 | 19890816      | LSPB        | +     | published / reissued                             |         |

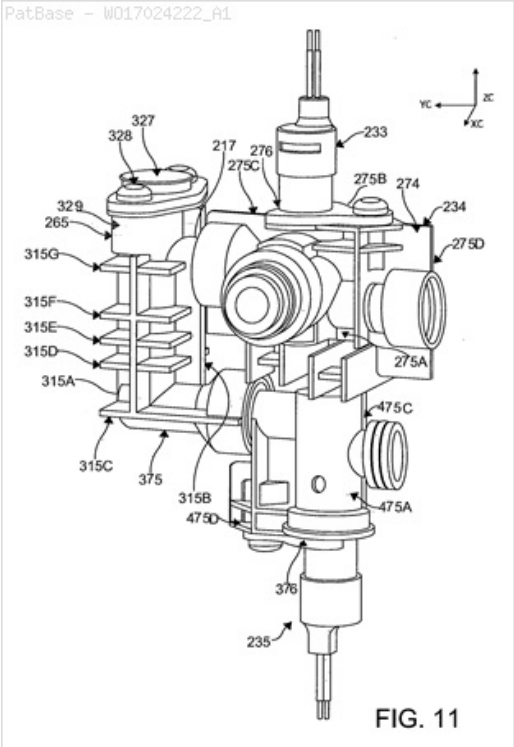
|               |          |      |   |                                      |
|---------------|----------|------|---|--------------------------------------|
| JP1558936 C3  | 19900516 | LSGT | + | granted / extensions (spc, cpc, pte) |
| JP1558936 C3  | 19981116 | PEXP |   | Calculated Patent Term Expiry        |
| JP54079369 A2 | 19790625 | LSPB | + | published / reissued                 |
| SE437358 B    | 19850225 | LSPB | + | published / reissued                 |
| SE437358 C    | 19850613 | LSGT | + | granted / extensions (spc, cpc, pte) |
| SE437358 C    | 19980529 | PEXP |   | Calculated Patent Term Expiry        |
| SE7806137 A   | 19781215 | LSPB | + | published / reissued                 |
| US4192557 A   | 19800311 | LSGT | + | granted / extensions (spc, cpc, pte) |

Title: **CONTROL** AND SUPPLY **VALVE** ASSEMBLY FOR A TIRE PRESSURE MANAGEMENT SYSTEM

Abstract: A **valve** assembly system including a supply **valve** assembly, a **control valve** assembly and a connecting module and the tire pressure management system made therewith.

Classifications:

International (IPC 8-9): B60C23/00 F16K11/07 F16K27/00 F16K27/02 F16K27/04 (Advanced/Invention)  
CPC: B60C23/003 F16K27/003 F16K27/029 F16K27/041 F16K11/0716



Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| WO17024222 A1      | 20170209         | WO2016US45765      | 20160805         |

Priority:

US20150201712P 20150806      US20160286177P 20160122

Probable Assignee: DANA HEAVY VEHICLE SYS GROUP

Assignee(s): (std): DANA HEAVY VEHICLE SYS GROUP

Assignee(s): DANA HEAVY VEHICLE SYSTEMS GROUP LLC

Inventor(s): (std): BLESSING CHRISTOPHER D ; GILLEN KURT P ; SIDDERS JASON M

Agent(s): EVANS STEPHEN P ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Legal status (INPADOC)

[View legal status timeline](#)

| Patent        | Date recorded | Event group | Code | Event                | Details |
|---------------|---------------|-------------|------|----------------------|---------|
| WO17024222 A1 | 20170209      | LSPB        | +    | published / reissued |         |

**Title:** APPARATUS AND METHOD FOR INHIBITING THE FORMATION OF TROPICAL CYCLONES

**Abstract:** Source: US2013038063A An apparatus for inhibiting the formation of tropical cyclones, comprising an elongated rigid tube through which cooler water is pumped from below to the near-ocean surface, thereby depriving incipient tropical cyclones of the heat energy they require for further development. The tube contains a pump comprising a fixed flap **valve** and a movable flap **valve**. The movable flap **valve** is attached to a drive disk encircling the tube at a depth where ambient waters have little vertical motion. The wave-driven vertical motion of the elongated tube causes the movable flap **valve** to oscillate with respect to the fixed flap **valve**, thereby pumping seawater upward onto the near-ocean surface. The apparatus also can navigate to alternative locations by means of a propulsion/steering system, and it can submerge to a safe depth to avoid oncoming vessels and potentially damaging seas. A fleet of apparatuses is required to provide the necessary cooling effect.

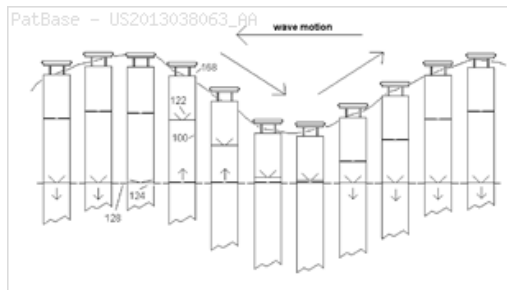
**Classifications:**

**International (IPC 8-9):** A01G15/00 F03B13/16

F04B9/10 (Advanced/Invention)

**CPC:** F03B13/1875 F03B13/20 Y02E10/38 A01G15/00 Y10T137/8376

**US:** 137/560 239/2.1 290/53 417/331



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2013038063 AA    | 20130214         | US20120584205      | 20120813         |

**Priority:**

US20110523024P 20110812 US20120584205 20120813

**Probable Assignee:** TAWIL JACK JOSEPH

**Assignee(s):** (std): TAWIL JACK JOSEPH

**Inventor(s):** (std): TAWIL JACK JOSEPH

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code  | Event                                               | Details |
|-----------------|---------------|-------------|-------|-----------------------------------------------------|---------|
| US2013038063 AA | 20130214      | LSPB        | +     | published / reissued                                |         |
| US2013038063 AA | 20151202      | LSWD        | -ABD3 | Abandoned -- Failure to Respond to an Office Action |         |

**Title:** Electrohydraulic **control** of linear hydraulic actuator - has proportional flow **control valve** responding to pressure feedback to provide load compensating action

**Abstract:** Source: DE4140408A1 An electro-hydraulic **control** unit (10) provides load compensated **control** of a double acting hydraulic linear actuator (11). The actuator is supplied from a constant speed pump (13) and the load condition is measured by a pressure sensor (16) coupled to an **electronic controller** (17). The hydraulic blocking of the actuator is provided by a 2/2 directional **valve** (18) and the load compensated operation is provided by a proportional 2 way restrictor **valve** (24). An entered reference flow rate signal (27) results in a command for the **valve**. USE/ADVANTAGE - Mast hydraulic of electric stacker. Maintains load independent operation of hydraulic engine in both directions including hoisting and lowering by **electronic control**.

**Classifications:**

**International (IPC 8-9):** B66F9/22 F15B11/00 F15B11/05 F15B21/08 G05D7/06 (Advanced/Invention);

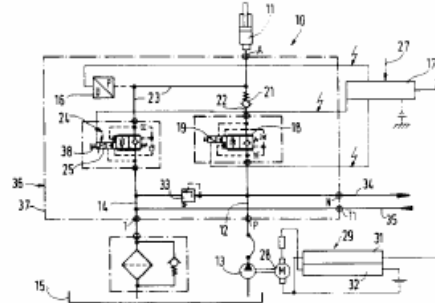
B66F9/20 F15B11/00 F15B21/00 G05D7/06 (Core/Invention)

**International (IPC 1-7):** B66F9/22 F15B21/08 F16K31/02 G05D7/06

**CPC:** B66F9/22 F15B11/003 F15B11/05 F15B21/087 G05D7/0635

**European:** B66F9/22 F15B11/00B F15B11/05 F15B21/08D G05D7/06F4B

PatBase - DE4140408\_A1



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE4140408 A1       | 19930609         | DE19914140408      | 19911207         |

**Priority:**

DE19914140408 19911207

**Probable Assignee:** ROBERT BOSCH GMBH

**Assignee(s):** ROBERT BOSCH GMBH

**Inventor(s):** ALTMANN UWE DIPL ING ; ALTMANN UWE DIPL ING 7141 SCHWIEBERDINGEN DE ; HESSE HORST DR DR ING ; HESSE HORST DR DR ING 7000 STUTTGART DE ; SANDAU HARTMUT DIPL ING ; SANDAU HARTMUT DIPL ING FH

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                  | Details |
|--------------|---------------|-------------|-------|----------------------------------------|---------|
| DE4140408 A1 | 19930609      | LSPB        | +     | published / reissued                   |         |
| DE4140408 A1 | 19970724      | LSSES       | +8110 | REQUEST FOR EXAMINATION PARAGRAPH 44   |         |
| DE4140408 A1 | 20061012      | LSLE        | -8139 | DISPOSAL/NON-PAYMENT OF THE ANNUAL FEE |         |

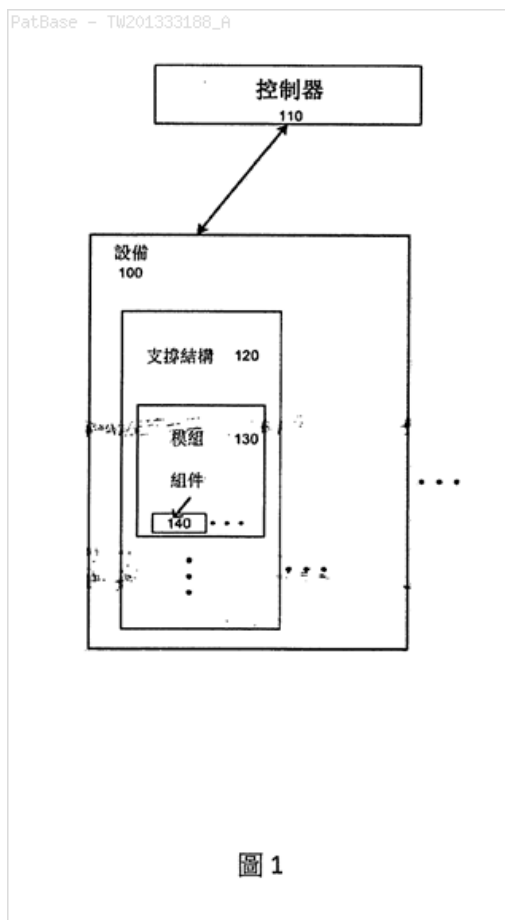
**Title:** SYSTEMS AND METHODS FOR MULTI-ANALYSIS

**Abstract:** Source: TW201333188A Systems and methods are provided for sample processing. A device may be provided, capable of receiving the sample, and performing one or more of a sample preparation, sample assay, and detection step. The device may be capable of performing multiple assays. The device may comprise one or more modules that may be capable of performing one or more of a sample preparation, sample assay, and detection step. The device may be capable of performing the steps using a small volume of sample.

**Classifications:**

**International (IPC 8-9):** A61B6/00 C12M1/00  
G01N35/00 (Advanced/Invention)

**CPC:** G01N35/1065 G01N35/00 G01N2035/00326



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU2013205132 AA    | 20130516         | AU20130205132      | 20130413         |
| AU2013205132 BB    | 20160204         | AU20130205132      | 20130413         |
| AU2013205139 AA    | 20130523         | AU20130205139      | 20130413         |
| AU2013205139 BB    | 20160317         | AU20130205139      | 20130413         |
| AU2013205142 AA    | 20130523         | AU20130205142      | 20130413         |
| AU2013205142 BB    | 20160128         | AU20130205142      | 20130413         |
| AU2016202045 AA    | 20160428         | AU20160202045      | 20160401         |
| SG10201602141Q A1  | 20160428         | SG20161002141      | 20120925         |
| TW201333188 A      | 20130816         | TW20120135220      | 20120925         |

**Priority:**

|               |          |               |          |               |          |
|---------------|----------|---------------|----------|---------------|----------|
| AU20120318963 | 20120925 | AU20130205139 | 20130413 | US20110244836 | 20110926 |
| US20110244946 | 20110926 | US20110244947 | 20110926 | AU20160202045 | 20160401 |
| WO2011US53189 | 20110925 | WO2011US53188 | 20110925 | WO2012US57155 | 20120925 |

**Probable Assignee:** THERANOS INC

**Assignee(s):** (std): THERANOS INC

**Inventor(s):** (std): BALWANI SUNNY ; FRANKOVICH JOHN KENT ; FRENZEL GARY ; HOLMES ELIZABETH ; ROY JOY

**Agent(s):** SPRUSON AND FERGUSON; SPRUSON AND FERGUSON ASIA PTE LTD

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code | Event                                              | Details |
|-----------------|---------------|-------------|------|----------------------------------------------------|---------|
| AU2013205132 AA | 20160602      | LSGT        | +FGA | LETTERS PATENT SEALED OR GRANTED (STANDARD PATENT) |         |
| AU2013205132 BB | 20330413      | PEXP        |      | Calculated Patent Term Expiry                      |         |
| AU2013205139 AA | 20160714      | LSGT        | +FGA | LETTERS PATENT SEALED OR GRANTED (STANDARD PATENT) |         |
| AU2013205139 BB | 20330413      | PEXP        |      | Calculated Patent Term Expiry                      |         |

|                   |          |      |      |                                                       |
|-------------------|----------|------|------|-------------------------------------------------------|
| AU2013205142 AA   | 20160526 | LSGT | +FGA | LETTERS PATENT SEALED OR GRANTED<br>(STANDARD PATENT) |
| AU2013205142 BB   | 20330413 | PEXP |      | Calculated Patent Term Expiry                         |
| SG10201602141Q A1 | 20160428 | LSPB | +    | published / reissued                                  |
| TW201333188 A     | 20130816 | LSPB | +    | published / reissued                                  |

**Title:** Process for drying compressed air.

**Abstract:** A device operating according to the principle of the two-container air dryer for drying compressed air has two air dryers (14, 15) operated alternately at intervals in the drying phase and regeneration phase, the switch-over being controlled by an electronic control valve (40). To reduce the size of the control valve (40) with respect to flow, volume and capacity, the air dryers (14, 15) are connected on the inlet side to a change-over valve (18) and additionally connected each to one pneumatically controlled two-way valve (34, 35) which clears a vent orifice (36, 37) in its controlled switching position and blocks this orifice in its uncontrolled switching position. The two-way valves (34, 35) are controlled by the control valve (40), the control pressure being applied to the control inlet of that two-way valve (34, 35) which belongs to the air dryer (14, 15) being operated in the regeneration phase. The control inlet of the two-way valve (34, 35) which belongs to the air dryer (14, 15) in the drying phase is at the same time vented via the control valve (40) (Figure 1).

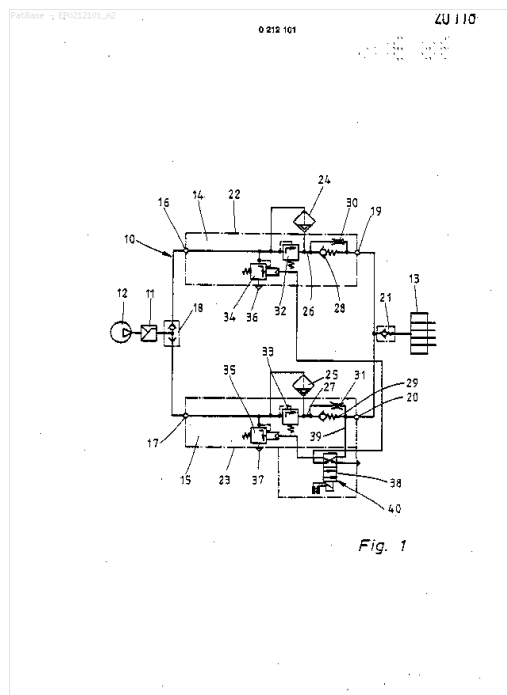
**Classifications:**

**International (IPC 8-9):** B01D53/26 B60T17/00 (Advanced/Invention)

**International (IPC 1-7):** B01D53/04 B01D53/26 B60T17/00

**CPC:** B01D53/261 B60T17/004

**European:** B01D53/26B B60T17/00A1



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE3525083 A1       | 19870122         | DE19853525083      | 19850713         |
| EP0212101 A2       | 19870304         | EP19860107575      | 19860604         |
| EP0212101 A3       | 19880615         | EP19860107575      | 19860604         |

**Priority:**

DE19853525083 19850713

**Probable Assignee:**

BOSCH GMBH ROBERT

**Assignee(s): (std):**

BOSCH GMBH ROBERT

**Assignee(s):**

ROBERT BOSCH GMBH

**Inventor(s): (std):**

HAAS HEINO DIPL ING

**Designated states:**

DE FR GB NL SE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                  | Details                   |
|--------------|---------------|-------------|-------|----------------------------------------|---------------------------|
| DE3525083 A1 | 19870122      | LSPB        | +     | published / reissued                   |                           |
| DE3525083 A1 | 19900705      | LSLE        | -8139 | DISPOSAL/NON-PAYMENT OF THE ANNUAL FEE |                           |
| EP0212101 A2 | 19870304      | LSPB        | +     | published / reissued                   |                           |
| EP0212101 A2 | 19890125      | LSSES       | +17P  | REQUEST FOR EXAMINATION FILED          | EFFECTIVE DATE : 19881124 |
| EP0212101 A2 | 19890503      | LSSES       | +17Q  | FIRST EXAMINATION REPORT               | EFFECTIVE DATE : 19890317 |
| EP0212101 A2 | 19900307      | LSRV        | -18R  | REFUSED                                | EFFECTIVE DATE : 19890909 |

**Title:** SYSTEM FOR EXHAUST **VALVE** ACTUATION

**Abstract:** Source: US200727779A A variable **valve** actuation system is disclosed for providing exhaust to at least one component downstream of an engine. The system includes an exhaust **valve** disposed in an engine cylinder and a hydraulic actuation system. The system also includes a braking **control valve**, a supply of hydraulic fluid operably connected to the hydraulic actuation system, and an exhaust **valve** actuating device operably connected to the **valve** actuation system. The exhaust **valve** actuating device is operable to affect the exhaust **valve** to open within the engine cylinder. The system further includes a device for **controlling** a position of the exhaust **valve** actuating device relative to a position of the exhaust **valve**. The **controlling** device is operably connected to the supply of hydraulic fluid.

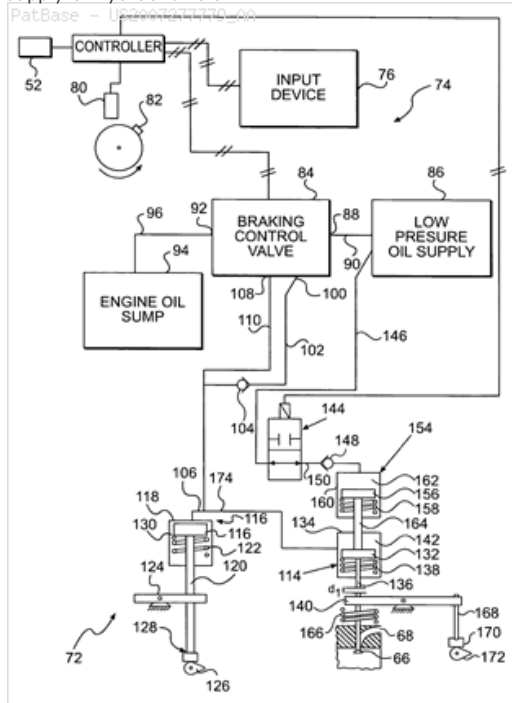
**Classifications:**

**International (IPC 8-9):** F01L1/34 F01L13/06 F01L9/02 F02D13/02 F02D13/04 F02D41/02 (Advanced/Invention); F01L1/34 F01L13/06 F01L9/00 F02D13/02 F02D13/04 F02D41/02 (Core/Invention)

**CPC:** F01L9/025 F01L13/065 F01L2001/34446 F02D13/0246 F02D13/04 F02D41/0065 F02D41/0275 F02D2041/001

**European:** F01L13/06B F01L9/02B2B F02D13/02E2 F02D13/04 R01L1/344E1C R02D41/00D6 R02D41/00F6E R02D41/02C4D1

**US:** 123/321 123/321S 123/322 123/90.16 123/90.160S



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN101484666 A      | 20090715         | CN200780024905     | 20070330         |
| DE112007001305 T5  | 20090430         | DE200711001305T    | 20070330         |
| US2007277779 AA    | 20071206         | US20060443057      | 20060531         |
| WO07142724 A1      | 20071213         | WO2007US08016      | 20070330         |

**Priority:**

US20060443057 20060531 WO2007US08016 20070330

**Probable Assignee:** CATERPILLAR INC

**Assignee(s):** (std): CATERPILLAR INC ; CORNELL SEAN O ; MCCLURE THOMAS R ; PIPIS JOHN S JR

**Inventor(s):** (std): CORENLL SEAN O ; CORNELL SEAN O ; MCCLURE THOMAS R ; PIPIS JOHN S ; PIPIS JOHN S JR

**Agent(s):** CATERPILLAR FINNEGAN HENDERSON LLP

**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

**Legal status (INPADOC)**

View legal status timeline

| Patent            | Date recorded | Event group | Code  | Event                                                                       | Details                   |
|-------------------|---------------|-------------|-------|-----------------------------------------------------------------------------|---------------------------|
| CN101484666 A     | 20090715      | LSPB        | +     | published / reissued                                                        |                           |
| CN101484666 A     | 20090715      | LSPB        | +C06  | PUBLICATION                                                                 |                           |
| CN101484666 A     | 20100203      | LSDW        | -C02  | DEEMED WITHDRAWAL OF PATENT APPLICATION AFTER PUBLICATION (PATENT LAW 2001) |                           |
| DE112007001305 T5 | 20090430      | LSPB        | +     | published / reissued                                                        |                           |
| DE112007001305 T5 | 20140626      | LSDW        | -R005 | APPLICATION DEEMED WITHDRAWN DUE TO                                         | EFFECTIVE DATE : 20140401 |

|                 |          |      |       |                                                         |                                                                                                                                                                                                                                                        |
|-----------------|----------|------|-------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       | FAILURE TO<br>REQUEST<br>EXAMINATION                    |                                                                                                                                                                                                                                                        |
| US2007277779 AA | 20071206 | LSPB | +     | published /<br>reissued                                 |                                                                                                                                                                                                                                                        |
| US2007277779 AA | 20060531 | LSAS | AS    | ASSIGNMENT                                              | OWNER NAME : CATERPILLAR INC.,<br>ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:MCCLURE, THOMAS R.;<br>CORNELL, SEAN O.; PIPIS JR.,<br>JOHN S.;<br>REEL/FRAME:017948/0895;<br>SIGNING DATES FROM 20060530<br>TO 20060531 |
| US2007277779 AA | 20090330 | LSWD | -ABD2 | Abandoned --<br>Failure to Pay<br>Issue Fee             |                                                                                                                                                                                                                                                        |
| WO07142724 A1   | 20071213 | LSPB | +     | published /<br>reissued                                 |                                                                                                                                                                                                                                                        |
| WO07142724 A1   | 20081203 | LSNP | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL<br>PHASE | REF DOCUMENT NUMBER :<br>1120070013052<br>COUNTRY OF REF DOCUMENT : DE                                                                                                                                                                                 |

**Title:** INTERMITTENT POSITIVE PRESSURE VENTILATION (IPPV)

**Abstract:** Source: IN00444MU2007A A Mechanised Intermittent Positive Pressure Ventilation (IPPV) for medical use consists of a self expanding bellows having air suction opening at one end with n.r.v (non return **valve**) to allow fresh atmospheric air/oxygen in and a delivery opening for the same at the other end. The bellows is placed inside a suitable **housing** which is provided with atmospheric air inlets and suction nipple for oxygen at one end and delivery outlet nipple for air/oxygen at the opposite end. The self expanding bellows delivery opening is connect ed inside the **housing** with flexible tube to the delivery outlet nipple of the **housing**. The self expanding bellows is compressed inside the **housing** by mechanical means comprising of presser plate, piston and cam, rotated by suitable capacity electric motor delivering the desired rpm (revolutions per minute) as per intended category of patients/model. The compressed air/oxygen from bellows is delivered by flexible tube to SPEC (special patient end coupling) through a disposable (one time use only) bacteriological air filter. The SPEC is made of a rigid tube having two hollow cavities/chambers partitioned by a spring loaded stopper with provision for fixing face mask or endotracheal intubation adopter as may be required at one end. And on the other end the SPEC has; inbuilt air pressure releas e **valve** consisting of a screw-on cap with knob bolt, spring, stopper and suitable perforations on side wall which serves as excess volume/pressure and expired air release **valve** and also as regulator for pressure delivery by turning the knob bolt. Due to this inbuilt pressure release **valve** firstly, air volume delivery is moderated/**controlled** allowing excess/unnecessary air volume/pressure to escape so as to suit, individual lung size of wide range of patients in the intended category/model; secondly, to provide expired air releas e/escape way out of the system/system and thirdly, for regulating pressure as desired by turning the knob bolt provided in clockwise or anticlockwise direction as may be required. The SPEC also has one connection nipple on the side wall for connect ing compressed air/oxygen from bellows wherein an n.r.v is provided for preventing inflow of expired air into the flexible inlet tube. A manometer is fixed/connect ed on the side wall of SPEC for gauging air pressure being delivered to patient at fae mask or endotracheal adopter level. I This invention can prove to be a boon for mankind. As it not only saves lives but also prevents disabilities due to anoxic and hypoxic brain damage which is the direct outcome of improper resuscitation/ventilation of patients needing it. This can be of great use to the general masses which ever location they are. Poorest of the poor stand to gain due to the widespread use of this marvellous invention. It is ideal where the Govt, does not provide the facility of ventilator and where the masses cannot afford treatment in tertiary health care centres or five star hospitals nor do they have means to reach such places safely for treatment.

**Classifications:**

**International (IPC 1-7):** A61M11/00

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| IN00444MU2007 A    | 20090515         | IN2007MU00444      | 20070307         |

**Probable Assignee:** VINOD NAIR

**Assignee(s):** VINOD NAIR

**Inventor(s):** VINOD NAIR

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code | Event                | Details |
|-----------------|---------------|-------------|------|----------------------|---------|
| IN00444MU2007 A | 20090515      | LSPB        | +    | published / reissued |         |

**Title:** ACTIVE HYDROPNEUMATIC SUSPENSION SYSTEM

**Abstract:** Source: US4898257A An active suspension system for use with a mass suspended relative to a movable structure and subject to external forces such as the chassis of off-road vehicles, and in particular the hull of heavy combat vehicles, has a passive hydropneumatic suspension system (PHSS) connected to a servopump and an accumulator, and wherein the servopump transfers fluid energy between the accumulator and the suspension system, in accordance with sensed operating conditions which are inputted to a processor whose output commands the velocity of the servopump to **control** the pressure and volume relationships of the PHSS and accumulator to improve the ride of said vehicle and to substantially reduce energy requirements when operating off-road.

**Classifications:**

**International (IPC 8-9):** B60G17/015 B60G17/04 B62D55/112 B62D55/116 (Advanced/Invention);

B60G17/015 B60G17/04 B62D55/104 (Core/Invention)

**International (IPC 1-7):** B60G17/04 B60G17/08 B62D55/112

**CPC:** Y10S280/01 B62D55/116 B60G17/0152 B60G17/04

B60G2202/15 B60G2400/102 B60G2400/204 B60G2400/208

B60G2400/252 B60G2500/30 B60G2600/14 B60G2600/16

B60G2600/602 B60G2600/604 B62D55/112

**European:** B60G17/015B B60G17/04 B62D55/112 B62D55/116

L60G202/15 L60G400/102 L60G400/204 L60G400/208 L60G400/252

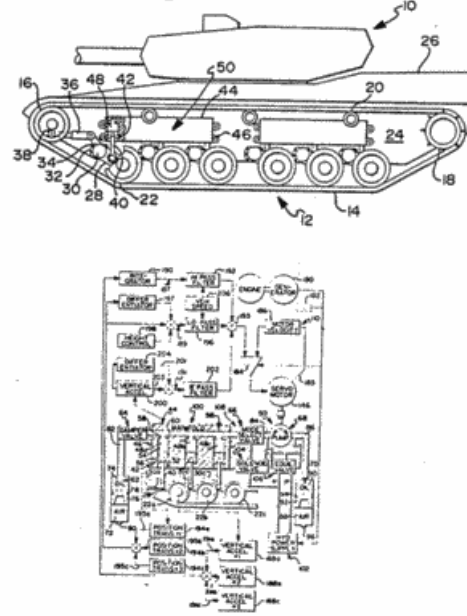
L60G500/30 L60G600/14 L60G600/16 L60G600/602 L60G600/604

**US:** 180/22 180/41 180/9.1 180/9.52 188/305 267/218 280/124.128

280/124.159 280/5.503 280/5.507 280/6.12 280/705 280/707

280/DIG.1

PatBase - US4898257\_A

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US4898257 A        | 19900206         | US19880251676      | 19880930         |
| US5097916 A        | 19920324         | US19890449556      | 19891212         |

**Priority:**

US19880251676 19880930 US19890449556 19891212

**Probable Assignee:** GENERAL DYNAMICS LAND SYSTEMS INC

**Assignee(s):** (std): BRANDSTADTER JACK M ; CADILLAC GAGE TEXTRON

**Assignee(s):** CADILLAC GAGE TEXTRON INC ; GENERAL DYNAMICS LAND SYSTEMS INC

**Inventor(s):** (std): BRANDSTADTER JACK M

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent      | Date recorded | Event group | Code  | Event                                     | Details                                                                                                                                                                                                       |
|-------------|---------------|-------------|-------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US4898257 A | 19900206      | LSGT        | +     | granted / extensions (spc, cpc, pte)      |                                                                                                                                                                                                               |
| US4898257 A | 19900423      | LSAS        | AS    | ASSIGNMENT                                | OWNER NAME : CADILLAC GAGE TEXTRON INC.<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.;<br>ASSIGNOR: BRANDSTADTER, JACK M.; REEL/FRAME: 005293/0146<br>EFFECTIVE DATE : 19900417                          |
| US4898257 A | 19930802      | LSFE        | +FPAY | FEE PAYMENT                               | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                       |
| US4898257 A | 19970806      | LSFE        | +FPAY | FEE PAYMENT                               | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                       |
| US4898257 A | 19990708      | LSAS        | AS    | ASSIGNMENT                                | OWNER NAME : GENERAL DYNAMICS LAND SYSTEMS INC., MICHIGAN<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR: CADILLAC GAGE TEXTRON INC.;<br>REEL/FRAME: 010078/0235<br>EFFECTIVE DATE : 19990706 |
| US4898257 A | 20020206      | LSLE        | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES |                                                                                                                                                                                                               |

|             |          |      |       |                                                                         |                                                                                                                                                                                                                    |
|-------------|----------|------|-------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US4898257 A | 20020305 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                                                                                                                                                                    |
| US4898257 A | 20060509 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20020206                                                                                                                                                                                          |
| US4898257 A | 20080930 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                                                                                                    |
| US5097916 A | 19920324 | LSGT | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                                                    |
| US5097916 A | 19900423 | LSAS | AS    | ASSIGNMENT                                                              | OWNER NAME : CADILLAC GAGE<br>TEXTRON INC.<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST.;<br>ASSIGNOR:BRANDSTADTER, JACK<br>M.; REEL/FRA:005293/0119<br>EFFECTIVE DATE : 19900417                          |
| US5097916 A | 19920312 | LSGT | PAT1  | Patented Case                                                           |                                                                                                                                                                                                                    |
| US5097916 A | 19950824 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                            |
| US5097916 A | 19990708 | LSAS | AS    | ASSIGNMENT                                                              | OWNER NAME : GENERAL DYNAMICS<br>LAND SYSTEMS INC., MICHIGAN<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:CADILLAC GAGE<br>TEXTRON INC.;<br>REEL/FRA:010078/0235<br>EFFECTIVE DATE : 19990706 |
| US5097916 A | 19990830 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                            |
| US5097916 A | 20040324 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                                                                                                                                                                                                                    |
| US5097916 A | 20040518 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20040324                                                                                                                                                                                          |
| US5097916 A | 20091212 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                                                                                                                                                                    |

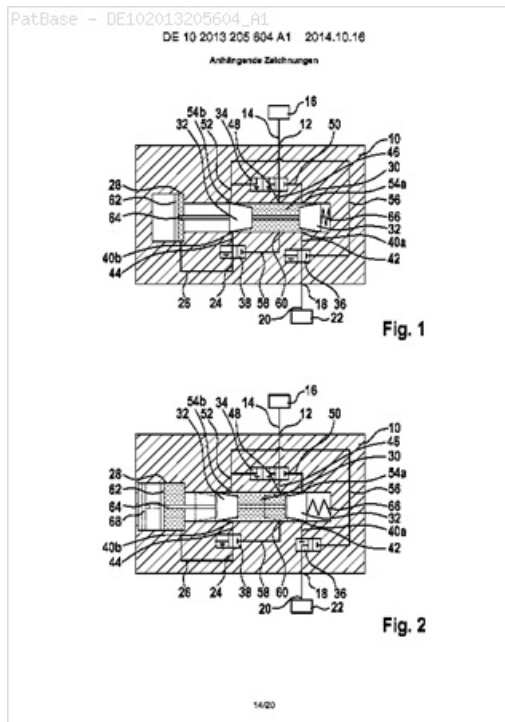
**Title:** VENTILVORRICHTUNG FUER EIN HYDRAULISCHES BREMSSYSTEM, STEUERVORRICHTUNG FUER EIN HYDRAULISCHES BREMSSYSTEM UND VERFAHREN ZUM BETREIBEN EINES HYDRAULISCHEN BREMSSYSTEMS EINES FAHRZEUGS **VALVE** DEVICE FOR A HYDRAULIC BRAKE SYSTEM, **CONTROL** DEVICE FOR A HYDRAULIC BRAKE SYSTEM AND METHOD FOR OPERATING A HYDRAULIC BRAKE SYSTEM OF A VEHICLE (Machine translation)

**Abstract:** Source: DE102013205604A1 Die Erfindung betrifft eine Ventilvorrichtung fuer ein hydraulisches Bremssystem eines Fahrzeugs. Die Ventilvorrichtung umfasst ein stetig verstellbares Verschlusssteil (32), mittels welchem zumindest eine erste Flusssichte eines ersten Teilstroms (T1) stetig steigerbar und eine zweite Flusssichte eines zweiten Teilstroms (T2) stetig reduzierbar sind. Dieser Vorteil ist auch bei einem hydraulischen Bremssystem fuer ein Fahrzeug mit der Ventilvorrichtung gewaehrleistet. Ebenso betrifft die Erfindung eine Steuervorrichtung (100) fuer ein hydraulisches Bremssystem eines Fahrzeugs. Des Weiteren betrifft die Erfindung ein Verfahren zum Betreiben eines hydraulischen Bremssystems eines Fahrzeugs. This invention relates to a **valve** device for a hydraulic brake system of a vehicle. The **valve** device comprises a continuously adjustable closure part (32) by means of which at least a first flux of a first part stream (T1) and a second steadily be increased flux density of a second part stream (T2) are steadily reduced. This advantage providing **electronic** also in a hydraulic brake system for a vehicle with the **valve** device. The invention also relates to a **control** device (100) for a hydraulic brake system of a vehicle. The invention further relates to a method for operating a hydraulic brake system of a vehicle.

**Classifications:**

**International (IPC 8-9):** B60T13/68 (Advanced/Invention)

**CPC:** B60T15/36 B60T8/4081 B60T8/409 B60T8/3665



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE102013205604 A1  | 20141016         | DE201310205604     | 20130328         |

**Priority:**

DE201310205604 20130328

**Probable Assignee:** BOSCH GMBH ROBERT

**Assignee(s): (std):** BOSCH GMBH ROBERT

**Assignee(s):** ROBERT BOSCH GMBH

**Inventor(s): (std):** HENZLER MARKUS ; ZWEEGE REMCO TEN

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code | Event                | Details |
|-------------------|---------------|-------------|------|----------------------|---------|
| DE102013205604 A1 | 20141016      | LSPB        | +    | published / reissued |         |

**Title:** PNEUMATICALLY ACTUATED PARKING BRAKE

**Abstract:** Source: US2005092563A A vehicle parking brake system pneumatically actuates an air cylinder to mechanically lock a wheel brake in an applied position in response to a parking demand request. The air cylinder includes an extendable shaft that supports a lock member. When a parking demand request is initiated by moving a hand **control**, an air chamber is pressurized with air from a parking reservoir via a **valve** assembly to apply the wheel brake. Air pressure is released from the air cylinder and the lock member is moved into engagement with a brake component to lock the wheel brake in the applied condition. The wheel brake remains locked even if pressure is released from the air chamber. When a release command is initiated, the air cylinder is pressurized and the lock member is moved out of engagement with the brake component.

**Classifications:**

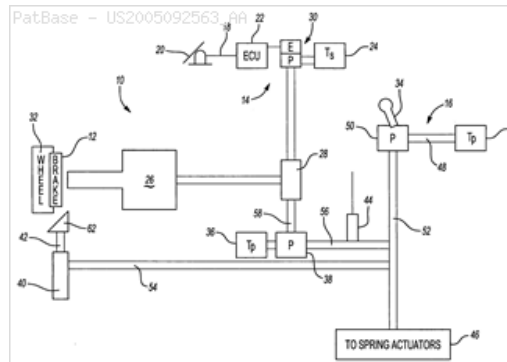
**International (IPC 8-9):** B60T13/68 B60T15/04 B60T17/16 B60T17/18 F16D65/22 F16D65/24 (Advanced/Invention)

**International (IPC 1-7):** B60T13/68 B60T15/04 B60T17/16 B60T17/18 B60T8/34

**CPC:** B60T13/68 B60T15/041 B60T17/16 B60T17/18

**European:** B60T13/68 B60T15/04B B60T17/16 B60T17/18

**US:** 188/170 188/265 188/72.7



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE602004009021 D1  | 20071031         | DE200460009021T    | 20041022         |
| DE602004009021 T2  | 20080619         | DE200460009021T    | 20041022         |
| EP1529706 A1       | 20050511         | EP20040256549      | 20041022         |
| EP1529706 B1       | 20070919         | EP20040256549      | 20041022         |
| US2005092563 AA    | 20050505         | US20030701354      | 20031104         |
| US6994191 BB       | 20060207         | US20030701354      | 20031104         |

**Priority:**

US20030701354 20031104

**Probable Assignee:** ARVINMERITOR TECHNOLOGY LLC

**Assignee(s):** (std): ARVINMERITOR TECHNOLOGY LLC

**Assignee(s):** JPMORGAN CHASE BANK NATIONAL ASSOCIATION FOR ITSEL ; JPMORGAN CHASE BANK NATIONAL ASSOCIATION FOR ITSELF AND ADMINISTRATIVE AGENT FOR LENDERS AS ; KRAMER DENNIS A ; LLC ; MCCANN DENIS J ; ARVINMERITOR TECHNOLOGY

**Inventor(s):** (std): KRAMER DENNIS ; KRAMER DENNIS A ; MCCANN DENIS J ; MCCANN DENIS JOHN

**Inventor(s):** MCCANN DENIS

**Agent(s):** CARLSON GASKEY AND OLDS PC; CARLSON GASKEY AND OLDS

**Designated states:** DE FR GB IT SE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code  | Event                                   | Details                                              |
|-------------------|---------------|-------------|-------|-----------------------------------------|------------------------------------------------------|
| DE602004009021 D1 | 20081009      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION |                                                      |
| DE602004009021 D1 | 20100819      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE    |                                                      |
| DE602004009021 T2 | 20080619      | LSGT        | +     | granted / extensions (spc, cpc, pte)    |                                                      |
| DE602004009021 T2 | 20241022      | PEXP        |       | Calculated Patent Term Expiry           |                                                      |
| EP1529706 A1      | 20050511      | LSPB        | +     | published / reissued                    |                                                      |
| EP1529706 A1      | 20050629      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED           | EFFECTIVE DATE : 20050502                            |
| EP1529706 A1      | 20060201      | LSFE        | +AKX  | PAYMENT OF DESIGNATION FEES             | DESIGNATED STATE(S) : DE FR GB IT SE                 |
| EP1529706 A1      | 20060830      | LSES        | +17Q  | FIRST EXAMINATION REPORT                | EFFECTIVE DATE : 20050719                            |
| EP1529706 A1      | 20070919      | LSGT        | REG   | REFERENCE TO A NATIONAL CODE            | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D |

|                 |          |      |       |                                                                                       |                                                                                                                                                            |
|-----------------|----------|------|-------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1529706 A1    | 20080827 | LSGT | +26N  | NO OPPOSITION FILED                                                                   | EFFECTIVE DATE : 20080620                                                                                                                                  |
| EP1529706 A1    | 20090130 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20081016<br>YEAR OF FEE PAYMENT : 05                                                                               |
| EP1529706 A1    | 20090331 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : SE<br>PAYMENT DATE : 20081022<br>YEAR OF FEE PAYMENT : 05                                                                               |
| EP1529706 A1    | 20090331 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : IT<br>PAYMENT DATE : 20081025<br>YEAR OF FEE PAYMENT : 05                                                                               |
| EP1529706 A1    | 20090430 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : FR<br>PAYMENT DATE : 20081014<br>YEAR OF FEE PAYMENT : 05                                                                               |
| EP1529706 A1    | 20090630 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20081022<br>YEAR OF FEE PAYMENT : 05                                                                               |
| EP1529706 A1    | 20100602 | LSLE | -EUG  | SE: EUROPEAN PATENT HAS LAPSED                                                        |                                                                                                                                                            |
| EP1529706 A1    | 20100723 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST<br>EFFECTIVE DATE : 20100630                                                                            |
| EP1529706 A1    | 20100730 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : FR<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20091102                                               |
| EP1529706 A1    | 20100730 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20100501                                               |
| EP1529706 A1    | 20101130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20091022                                               |
| EP1529706 A1    | 20110331 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : IT<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20091022                                               |
| EP1529706 A1    | 20110531 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : SE<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20091023                                               |
| EP1529706 B1    | 20070919 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                            |
| EP1529706 B1    | 20241022 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                            |
| US2005092563 AA | 20050505 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                            |
| US6994191 BB    | 20060207 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                            |
| US6994191 BB    | 20040209 | LSAS | AS    | ASSIGNMENT                                                                            | OWNER NAME : ARVINMERITOR TECHNOLOGY, LLC, MICHIGAN<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:MCCANN, DENIS JOHN; KRAMER, DENNIS A.; |

|              |          |      |       |                                                                                        |                                                                                                                                                                                                                   |
|--------------|----------|------|-------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       |                                                                                        | REEL/FRAME:014970/0363;<br>SIGNING DATES FROM 20031104<br>TO 20031114                                                                                                                                             |
| US6994191 BB | 20061117 | LSAS | AS    | ASSIGNMENT                                                                             | OWNER NAME : JPMORGAN<br>CHASE BANK, NATIONAL<br>ASSOCIATION, FOR ITS<br>DESCRIPTION : SECURITY<br>AGREEMENT;<br>ASSIGNOR:ARVINMERITOR<br>TECHNOLOGY, LLC;<br>REEL/FRAME:018524/0669<br>EFFECTIVE DATE : 20060823 |
| US6994191 BB | 20090708 | LSFE | +FPAY | FEE PAYMENT                                                                            | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                           |
| US6994191 BB | 20140207 | LSLE | -LAPS | LAPSE FOR<br>FAILURE TO PAY<br>MAINTENANCE<br>FEES                                     |                                                                                                                                                                                                                   |
| US6994191 BB | 20140310 | LSLE | -PEX1 | Patent Expired<br>Due to<br>NonPayment of<br>Maintenance<br>Fees Under 37<br>CFR 1.362 |                                                                                                                                                                                                                   |
| US6994191 BB | 20140401 | LSLE | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE<br>FEE                                 | EFFECTIVE DATE : 20140207                                                                                                                                                                                         |
| US6994191 BB | 20231104 | PEXP |       | Calculated<br>Patent Term<br>Expiry                                                    |                                                                                                                                                                                                                   |

**Title:** MONITORING OF DOWNHOLE PARAMETERS AND TOOLS UTILIZING FIBRE OPTICS

**Abstract:** Source: GB200120433A A method of **controlling** production from a wellbore (12) comprises providing a producing string (106) carrying an electrical submersible pump (114,516) for pumping wellbore fluid to the surface, said string carrying a high voltage line (52) from a surface location to the pump for providing electrical power to the pump; and providing an optical fiber (122) carrying at least one fiber optic sensor (40) along the high voltage line for taking measurements of a wellbore parameter.

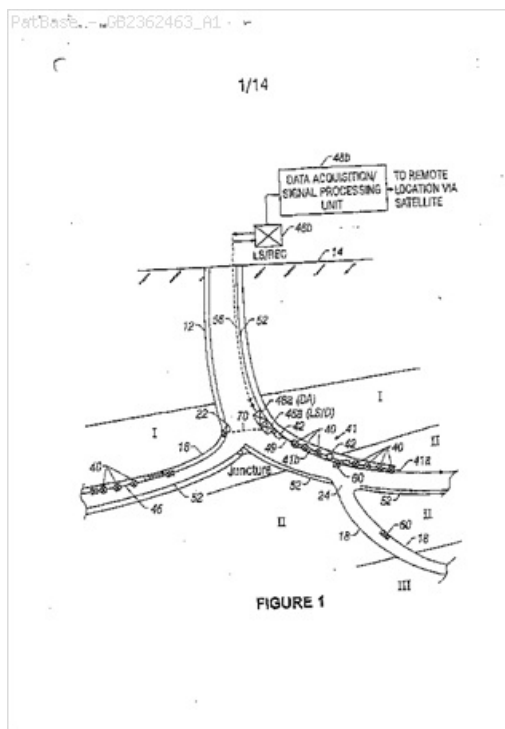
**Classifications:**

**International (ipc 8-9):** E21B23/03 E21B33/127 E21B34/10 E21B37/06 E21B41/00 E21B41/02 E21B43/12 E21B43/16 E21B43/20 E21B43/25 E21B43/26 E21B47/00 E21B47/01 E21B47/06 E21B47/10 E21B47/12 E21B49/00 E21B49/08 G01D5/26 G01N21/31 G01V1/40 G01V1/42 G01V1/46 G01V1/52 G01V11/00 G01V7/08 G01V7/16 G01V8/02 (Advanced/Invention)

**International (ipc 1-7):** E21B37/06 E21B41/02 E21B47/06 E21B47/10 E21B47/12 E21B47/14 G01V1/36 G01V8/10 G01V8/24

**CPC:** G01V2210/6163 G01V2210/6167 G01V11/002 E21B23/03 E21B33/1275 E21B37/06 E21B41/0035 E21B41/02 E21B43/12 E21B43/122 E21B43/123 E21B43/16 E21B43/20 E21B43/25 E21B43/26 E21B47/00 E21B47/011 E21B47/06 E21B47/065 E21B47/10 E21B47/101 E21B47/1015 E21B47/102 E21B47/123 E21B49/00 E21B49/006 E21B49/008 E21B49/08 G01D5/268 G01N21/31 G01V1/40 G01V1/42 G01V1/46 G01V1/52 G01V7/08 G01V7/16 G01V8/02 G01V11/00

**European:** E21B23/03 E21B33/127D E21B37/06 E21B41/00L E21B41/02 E21B43/12 E21B43/12B2 E21B43/12B2C E21B43/16 E21B43/20 E21B43/25 E21B43/26 E21B47/00 E21B47/01P E21B47/06 E21B47/06B E21B47/10 E21B47/10D E21B47/10G E21B47/10K E21B47/12M2 E21B49/00 E21B49/00M E21B49/00P E21B49/08 G01D5/26F G01N21/31 G01V1/40 G01V1/42 G01V1/46 G01V1/52 G01V11/00 G01V11/00B G01V7/08 G01V7/16 G01V8/02

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| GB200120433 A0     | 20011017         | GB20010020433      | 19980501         |
| GB200120438 A0     | 20011017         | GB20010020438      | 19980501         |
| GB2362462 A1       | 20011121         | GB20010020433      | 19980501         |
| GB2362462 B2       | 20020123         | GB20010020433      | 19980501         |
| GB2362463 A1       | 20011121         | GB20010020438      | 19980501         |
| GB2362463 B2       | 20020123         | GB20010020438      | 19980501         |

**Priority:**

|                         |                         |                         |
|-------------------------|-------------------------|-------------------------|
| GB19990025977 19980501  | US19970045354P 19970502 | US19970048989P 19970609 |
| US19970052042P 19970709 | US19970062953P 19971010 | US19980073425P 19980202 |
| US19980079446P 19980326 |                         |                         |

**Probable Assignee:** BAKER HUGHES INC

**Assignee(s):** (std): BAKER HUGHES INC

**Inventor(s):** (std): BIDIGARE BRIAN ; HARRELL JOHN ; JOHNSON MICHAEL ; TUBEL PAULO S ; VOLL BENN ARILD ; WILLIAMS GLYNN

**Inventor(s):** MICHAEL JOHNSON ; PAULO S TUBEL ; JOHN HARRELL ; BRIAN BIDIGARE ; GLYNN WILLIAMS ; BENN ARILD VOLL

**Legal status (INPADOC)**

View legal status timeline

| Patent       | Date recorded | Event group | Code  | Event                                            | Details                   |
|--------------|---------------|-------------|-------|--------------------------------------------------|---------------------------|
| GB2362462 A1 | 20011121      | LSPB        | +     | published / reissued                             |                           |
| GB2362462 B2 | 20020123      | LSGT        | +     | granted / extensions (spc, cpc, pte)             |                           |
| GB2362462 B2 | 20180501      | PEXP        |       | Calculated Patent Term Expiry                    |                           |
| GB2362463 A1 | 20011121      | LSPB        | +     | published / reissued                             |                           |
| GB2362463 A1 | 20041222      | LSLE        | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE | EFFECTIVE DATE : 20040501 |
| GB2362463 B2 | 20020123      | LSGT        | +     | granted / extensions (spc, cpc, pte)             |                           |
| GB2362463 B2 | 20180501      | PEXP        |       | Calculated Patent Term Expiry                    |                           |

**Title:** CELLULAR SIGNAL ENHANCER

**Abstract:** A low-cost user portable signal enhancer unit for extending service coverage of wireless communications to a user in a desired area of limited coverage. The enhancement supports an increase of signal power levels to allow wireless communication usage in a location, such as a small office or home office environment where the original cellular signals are weak or unreliable. A base station signal is enhanced by a bi-directional amplifier device (BDA), which receives a base station signal, amplifies the signal power and retransmits the amplified signal in a first signal path to a user in close proximity. The bi-directional amplifier also receives a user signal, amplifies the signal power and retransmits the amplified signal to the base station in a second separate signal path. Dual polarized antennas can receive and transmit the respective signals at opposite polarizations to increase isolation of the signals.

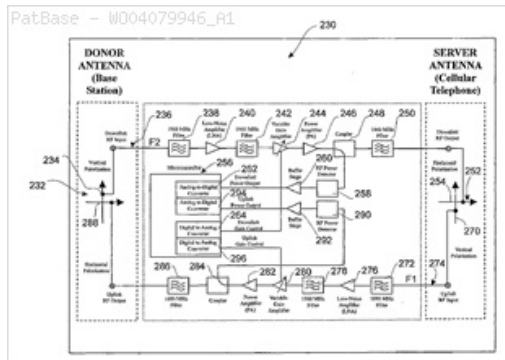
**Classifications:**

**International (IPC 8-9):** H04B7/15 H04B7/155 H04B7/24 H04B7/26 H04J11/00 H04L12/56 H04W16/26 (Advanced/Invention); H04B7/155 H04Q7/36 H04W16/26 H04W52/14 (Advanced/Non-invention); H04Q7/36 (Core/Non-invention); H04B (Subclass/Invention)

**International (IPC 1-7):** H04B7/15 H04B7/155 H04B7/26

**CPC:** H04B7/15507 H04B7/15535 H04B7/1555

**European:** H04B7/155C H04B7/155F1 H04B7/155F3 H04W216/26 H04W3/024 H04W7/150 H04W8/102



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT370559 E         | 20070915         | AT20030716225T     | 20030226         |
| AU2003219940 AA    | 20040928         | AU20030219940      | 20030226         |
| AU2003219940 BB    | 20091001         | AU20030219940      | 20030226         |
| AU2003219940 CA    | 20100304         | AU20030219940      | 20030226         |
| BRPI0318162 A      | 20060221         | BR2003PI18162      | 20030226         |
| CA2516967 AA       | 20050823         | CA20032516967      | 20030226         |
| CN1765067 A        | 20060426         | CN20038026337      | 20030226         |
| CN1765067 B        | 20101110         | CN20038026337      | 20030226         |
| DE60315728 D1      | 20070927         | DE20036015728      | 20030226         |
| DE60315728 T2      | 20080605         | DE20036015728T     | 20030226         |
| EP1597839 A1       | 20051123         | EP20030716225      | 20030226         |
| EP1597839 A4       | 20060913         | EP20030716225      | 20030226         |
| EP1597839 B1       | 20070815         | EP20030716225      | 20030226         |
| ES2291625 T3       | 20080301         | ES20030716225T     | 20030226         |
| HK1086395 A1       | 20110812         | HK20060106107      | 20060526         |
| HK1086395 A3       | 20060915         | HK20060106107      | 20060526         |
| IN00961MN2005 A    | 20060519         | IN2005MN00961      | 20050830         |
| IN210477 B         | 20070315         | IN2005MN00961      | 20050830         |
| JP2006514488 T2    | 20060427         | JP20040569156T     | 20030226         |
| KR100978878 B1     | 20100831         | KR20057015804      | 20030226         |
| KR20050102680 A    | 20051026         | KR20057015804      | 20030226         |
| MXPA05009144 A1    | 20051020         | MX2005PA09144      | 20030226         |
| WO04079946 A1      | 20040916         | WO2003US06056      | 20030226         |

**Priority:**

EP20030716225 20030226 KR20050015804 20050825 WO2003US06056 20030226

**Probable Assignee:** ANDREW CO

**Assignee(s):** (std): ANDREW CO ; ANDREW CORP ; EMS TECHNOLOGIES INC

**Assignee(s):** MAXWELL JAMES WILLIAM ; MCKAY DAVID L SR ; RUNYON DONALD L ; THOMPSON STEPHEN BRETT ; MCNEILL DONALD JOSEPH

**Inventor(s):** (std): MAXWELL JAMES ; MCKAY DAVID ; MCKAY DAVID L SR ; MCNEILL DONALD ; RUNYON DONALD ; THOMPSON STEPHEN ; ZOSIFER MAIKENAER DONAERDE ; WILLAM MAKESVIER JAMES ; THOMSON STEPHEN BRETT ; MENEILL DONALD JOSEPH ; MAICA DAVID L ; LUNIE DONARD L ; JAMES WILLIAM MAXWELL ; BLIGHT TOMPSSEN STIFFEN ; WIL MAICA DAVID L LUNIE DONAR ; THOMPSON STEPHEN BRETT ; STEPHEN BRETT THOMPSON ; RUNYON DONALD L ; MCNEILL DONALD JOSEPH ; MCKAY DAVID L ; MAXWELL JAMES WILLIAM ; DONALD L RUNYON ; DONALD JOSEPH MCNEILL ; DAVID L MCKAY

**Inventor(s):** MAICA DAVID L LUNIE DONARD L MAIKENAER DONAERDE Z ; DONALD JOSEPH MENEILL ; MAKESVIER JAMES WILLAM ; MAIKENAER DONAERDE ZOSIFER ; STEPHEN BRETT THOMSON ; TOMPSSEN STIFFEN BLIGHT

**Agent(s):** FB RICE ; FB RICE PTY LTD ; FINLAYSON AND SINGLEHURST

**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NL NO NZ OM PH PL PT RO RU SC SD SE SG SI SK SL SN SZ TD TG TJ TM TN TR TT TZ UA UG UZ VC VN YU ZA ZM ZW

**Legal status (INPADOC)**

[View legal status timeline](#)

**Patent Date recorded Event group Code Event Details**

AT370559 E 20070915 LSGT + granted / extensions

|                 |          |       |       |                                                                                                            |                                                                                                                           |
|-----------------|----------|-------|-------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| AT370559 E      | 20080115 | LSPB  | +UEP  | (spc, cpc, pte)<br>PUBLICATION OF<br>TRANSLATION OF<br>EUROPEAN PATENT<br>SPECIFICATION                    | REF DOCUMENT NUMBER :<br>1597839<br>COUNTRY OF REF DOCUMENT<br>: EP                                                       |
| AT370559 E      | 20230226 | PEXP  |       | Calculated Patent<br>Term Expiry                                                                           |                                                                                                                           |
| AU2003219940 AA | 20070201 | LSAS  | PC1   | ASSIGNMENT BEFORE<br>GRANT (SECT. 113)                                                                     | OWNER NAME : ANDREW<br>CORPORATION<br>DESCRIPTION : FORMER<br>APPLICANT(S): EMS<br>TECHNOLOGIES, INC.                     |
| AU2003219940 AA | 20091112 | LSRE  | DA2   | APPLICATIONS FOR<br>AMENDMENT SECTION<br>104                                                               | DESCRIPTION : THE NATURE<br>OF THE AMENDMENT IS AS<br>SHOWN IN THE STATEMENT(S)<br>FILED 24 SEP 2009.                     |
| AU2003219940 AA | 20100304 | LSRE  | DA3   | AMENDMENTS MADE<br>SECTION 104                                                                             | DESCRIPTION : THE NATURE<br>OF THE AMENDMENT IS AS<br>SHOWN IN THE STATEMENT(S)<br>FILED 24 SEP 2009                      |
| AU2003219940 AA | 20100311 | LSGT  | +FGA  | LETTERS PATENT<br>SEALED OR GRANTED<br>(STANDARD PATENT)                                                   |                                                                                                                           |
| AU2003219940 BB | 20230226 | PEXP  |       | Calculated Patent<br>Term Expiry                                                                           |                                                                                                                           |
| BRPI0318162 A   | 20060221 | LSPB  | +     | published / reissued                                                                                       |                                                                                                                           |
| BRPI0318162 A   | 20120529 | LSFE  | -B08F | APPLICATION FEES:<br>DISMISSAL - ARTICLE<br>86 OF INDUSTRIAL<br>PROPERTY LAW                               | DESCRIPTION : REFERENTE AS<br>8A E 9A ANUIDADES.                                                                          |
| BRPI0318162 A   | 20121016 | LSLE  | -B08K | LAPSE AS NO<br>EVIDENCE OF<br>PAYMENT OF THE<br>ANNUAL FEE HAS BEEN<br>FURNISHED TO INPI<br>(ACC. ART. 87) | DESCRIPTION : REFERENTE AO<br>DESPACHO 8.6 PUBLICADO NA<br>RPI 2160 DE 29/05/2012.                                        |
| CA2516967 AA    | 20050823 | LSPB  | +     | published / reissued                                                                                       |                                                                                                                           |
| CA2516967 AA    | 20050823 | LSNP  | +AFNE | NATIONAL PHASE<br>ENTRY                                                                                    |                                                                                                                           |
| CA2516967 AA    | 20080116 | LSSES | +EEER | EXAMINATION<br>REQUEST                                                                                     |                                                                                                                           |
| CA2516967 AA    | 20110228 | LSLE  | -FZDE | DEAD                                                                                                       |                                                                                                                           |
| CA2516967 AA    | 20110425 | LSLE  | -FZDE | DEAD                                                                                                       | EFFECTIVE DATE : 20110228                                                                                                 |
| CN1765067 A     | 20060426 | LSPB  | +     | published / reissued                                                                                       |                                                                                                                           |
| CN1765067 A     | 20060426 | LSPB  | +C06  | PUBLICATION                                                                                                |                                                                                                                           |
| CN1765067 A     | 20080109 | LSAS  | ASS   | SUCCESSION OR<br>ASSIGNMENT OF<br>PATENT RIGHT                                                             | OWNER NAME : ANDREW<br>CORP.<br>DESCRIPTION : FORMER<br>OWNER: EMS TECHNOLOGIES<br>IND<br>EFFECTIVE DATE : 20071207       |
| CN1765067 A     | 20080109 | LSAS  | C41   | TRANSFER OF PATENT<br>APPLICATION OR<br>PATENT RIGHT OR<br>UTILITY MODEL                                   |                                                                                                                           |
| CN1765067 A     | 20101110 | LSGT  | +C14  | GRANT OF PATENT OR<br>UTILITY MODEL                                                                        |                                                                                                                           |
| CN1765067 A     | 20110812 | LSGT  | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                            | REF COUNTRY CODE : HK<br>REF LEGAL EVENT CODE : GR<br>REF DOCUMENT NUMBER :<br>1086395<br>COUNTRY OF REF DOCUMENT<br>: HK |
| CN1765067 B     | 20101110 | LSGT  | +     | granted / extensions<br>(spc, cpc, pte)                                                                    |                                                                                                                           |
| CN1765067 B     | 20230226 | PEXP  |       | Calculated Patent<br>Term Expiry                                                                           |                                                                                                                           |
| DE60315728 D1   | 20080904 | LSGT  | +8364 | NO OPPOSITION<br>DURING TERM OF<br>OPPOSITION                                                              |                                                                                                                           |
| DE60315728 T2   | 20080605 | LSGT  | +     | granted / extensions<br>(spc, cpc, pte)                                                                    |                                                                                                                           |
| DE60315728 T2   | 20230226 | PEXP  |       | Calculated Patent<br>Term Expiry                                                                           |                                                                                                                           |
| EP1597839 A1    | 20051123 | LSPB  | +     | published / reissued                                                                                       |                                                                                                                           |

|              |          |       |       |                                                                                                          |                                                                                                                                                                                                         |
|--------------|----------|-------|-------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1597839 A1 | 20051123 | LSSES | +17P  | REQUEST FOR EXAMINATION FILED                                                                            | EFFECTIVE DATE : 20050823                                                                                                                                                                               |
| EP1597839 A1 | 20060913 | LSSES | +A4   | DESPATCH OF SUPPLEMENTARY SEARCH REPORT                                                                  | EFFECTIVE DATE : 20060809                                                                                                                                                                               |
| EP1597839 A1 | 20070516 | LSAS  | RAP1  | TRANSFER OF RIGHTS OF AN EP PUBLISHED APPLICATION                                                        | PARTYTYPE : OWNER<br>OWNER : ANDREW CORPORATION                                                                                                                                                         |
| EP1597839 A1 | 20070815 | LSGT  | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D                                                                                                                                                    |
| EP1597839 A1 | 20070831 | LSNP  | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                                                                                                                                      |
| EP1597839 A1 | 20070919 | LSGT  | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : FG4D                                                                                                                                                    |
| EP1597839 A1 | 20080131 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | COUNTRY OF REF DOCUMENT : BG<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20071115 |
| EP1597839 A1 | 20080131 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | COUNTRY OF REF DOCUMENT : NL<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070815 |
| EP1597839 A1 | 20080201 | LSLE  | -NLV1 | NL: LAPSED OR ANNULLED DUE TO FAILURE TO FULFILL THE REQUIREMENTS OF ART. 29P AND 29M OF THE PATENTS ACT | REF COUNTRY CODE : EP                                                                                                                                                                                   |
| EP1597839 A1 | 20080229 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | COUNTRY OF REF DOCUMENT : LI<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070815 |
| EP1597839 A1 | 20080229 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | COUNTRY OF REF DOCUMENT : CH<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070815 |
| EP1597839 A1 | 20080229 | LSLE  | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                                      |
| EP1597839 A1 | 20080301 | LSGT  | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FG2A<br>REF DOCUMENT NUMBER : 2291625<br>COUNTRY OF REF DOCUMENT : ES<br>KIND CODE OF REF DOCUMENT : T3<br>DESIGNATED STATE(S) :                        |
| EP1597839 A1 | 20080331 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | COUNTRY OF REF DOCUMENT : BE<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070815 |
| EP1597839 A1 | 20080430 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | COUNTRY OF REF DOCUMENT : DK<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE                                                 |

|              |          |      |       |                                                                                                      |                                                                                                                                                                                                                          |
|--------------|----------|------|-------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       |                                                                                                      | PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070815                                                                                                                                                                          |
| EP1597839 A1 | 20080430 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | COUNTRY OF REF DOCUMENT<br>: GR<br>NOTIFICATIONOFLAPSE :<br>LAPSE BECAUSE OF FAILURE<br>TO SUBMIT A TRANSLATION<br>OF THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20071116 |
| EP1597839 A1 | 20080530 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | COUNTRY OF REF DOCUMENT<br>: CZ<br>NOTIFICATIONOFLAPSE :<br>LAPSE BECAUSE OF FAILURE<br>TO SUBMIT A TRANSLATION<br>OF THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070815 |
| EP1597839 A1 | 20080530 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | COUNTRY OF REF DOCUMENT<br>: SK<br>NOTIFICATIONOFLAPSE :<br>LAPSE BECAUSE OF FAILURE<br>TO SUBMIT A TRANSLATION<br>OF THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070815 |
| EP1597839 A1 | 20080723 | LSGT | +26N  | NO OPPOSITION<br>FILED                                                                               | EFFECTIVE DATE : 20080516                                                                                                                                                                                                |
| EP1597839 A1 | 20081031 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | COUNTRY OF REF DOCUMENT<br>: MC<br>NOTIFICATIONOFLAPSE :<br>LAPSE BECAUSE OF NON-<br>PAYMENT OF DUE FEES<br>LAPSED DATE : 20080228                                                                                       |
| EP1597839 A1 | 20090130 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | COUNTRY OF REF DOCUMENT<br>: EE<br>NOTIFICATIONOFLAPSE :<br>LAPSE BECAUSE OF FAILURE<br>TO SUBMIT A TRANSLATION<br>OF THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070815 |
| EP1597839 A1 | 20090130 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | COUNTRY OF REF DOCUMENT<br>: IE<br>NOTIFICATIONOFLAPSE :<br>LAPSE BECAUSE OF NON-<br>PAYMENT OF DUE FEES<br>LAPSED DATE : 20080226                                                                                       |
| EP1597839 A1 | 20090630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | COUNTRY OF REF DOCUMENT<br>: SI<br>NOTIFICATIONOFLAPSE :<br>LAPSE BECAUSE OF FAILURE<br>TO SUBMIT A TRANSLATION<br>OF THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070815 |
| EP1597839 A1 | 20090731 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | COUNTRY OF REF DOCUMENT<br>: CY<br>NOTIFICATIONOFLAPSE :<br>LAPSE BECAUSE OF FAILURE<br>TO SUBMIT A TRANSLATION<br>OF THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070815 |
| EP1597839 A1 | 20100730 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | COUNTRY OF REF DOCUMENT<br>: HU<br>NOTIFICATIONOFLAPSE :<br>LAPSE BECAUSE OF FAILURE<br>TO SUBMIT A TRANSLATION<br>OF THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20080216 |
| EP1597839 A1 | 20100730 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE<br>TO EPO | COUNTRY OF REF DOCUMENT<br>: LU<br>NOTIFICATIONOFLAPSE :<br>LAPSE BECAUSE OF NON-<br>PAYMENT OF DUE FEES<br>LAPSED DATE : 20080226                                                                                       |

|              |          |      |       |                                                                                       |                                                                                                                                                                                                          |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1597839 A1 | 20100831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : TR<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070815 |
| EP1597839 A1 | 20111031 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : PT<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20070815 |
| EP1597839 A1 | 20160217 | LSFE | REG   | REFERENCE TO A NATIONAL CODE                                                          | COUNTRY OF REF DOCUMENT : FR<br>REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 14                                                                                         |
| EP1597839 A1 | 20160429 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20160223<br>YEAR OF FEE PAYMENT : 14                                                                                                                      |
| EP1597839 A1 | 20160429 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : ES<br>PAYMENT DATE : 20160226<br>YEAR OF FEE PAYMENT : 14                                                                                                                      |
| EP1597839 A1 | 20160429 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20160226<br>YEAR OF FEE PAYMENT : 14                                                                                                                      |
| EP1597839 A1 | 20160531 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : SE<br>PAYMENT DATE : 20160226<br>YEAR OF FEE PAYMENT : 14                                                                                                                      |
| EP1597839 A1 | 20160531 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : FI<br>PAYMENT DATE : 20160226<br>YEAR OF FEE PAYMENT : 14                                                                                                                      |
| EP1597839 A1 | 20160531 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20160226<br>YEAR OF FEE PAYMENT : 14                                                                                                                      |
| EP1597839 A1 | 20160531 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20160217<br>YEAR OF FEE PAYMENT : 14                                                                                                                      |
| EP1597839 A1 | 20160531 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : AT<br>PAYMENT DATE : 20160203<br>YEAR OF FEE PAYMENT : 14                                                                                                                      |
| EP1597839 A1 | 20170223 | LSFE | REG   | REFERENCE TO A NATIONAL CODE                                                          | COUNTRY OF REF DOCUMENT : FR<br>REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 15                                                                                         |
| EP1597839 A1 | 20170428 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : FI<br>PAYMENT DATE : 20170227<br>YEAR OF FEE PAYMENT : 15                                                                                                                      |
| EP1597839 A1 | 20170428 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20170227<br>YEAR OF FEE PAYMENT : 15                                                                                                                      |
| EP1597839 A1 | 20170428 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : SE<br>PAYMENT DATE : 20170227<br>YEAR OF FEE PAYMENT : 15                                                                                                                      |
| EP1597839 A1 | 20170428 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20170223<br>YEAR OF FEE PAYMENT : 15                                                                                                                      |

|                 |          |      |       |                                                |                                                                                     |
|-----------------|----------|------|-------|------------------------------------------------|-------------------------------------------------------------------------------------|
| EP1597839 A1    | 20170531 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE | COUNTRY OF REF DOCUMENT : AT<br>PAYMENT DATE : 20170201<br>YEAR OF FEE PAYMENT : 15 |
| EP1597839 A1    | 20170531 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20170227<br>YEAR OF FEE PAYMENT : 15 |
| EP1597839 A1    | 20170630 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE | COUNTRY OF REF DOCUMENT : ES<br>PAYMENT DATE : 20170227<br>YEAR OF FEE PAYMENT : 15 |
| EP1597839 A1    | 20170630 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20170223<br>YEAR OF FEE PAYMENT : 15 |
| EP1597839 B1    | 20070815 | LSGT | +     | granted / extensions (spc, cpc, pte)           |                                                                                     |
| EP1597839 B1    | 20230226 | PEXP |       | Calculated Patent Term Expiry                  |                                                                                     |
| ES2291625 T3    | 20080301 | LSGT | +     | granted / extensions (spc, cpc, pte)           |                                                                                     |
| ES2291625 T3    | 20230226 | PEXP |       | Calculated Patent Term Expiry                  |                                                                                     |
| HK1086395 A1    | 20110812 | LSGT | +     | granted / extensions (spc, cpc, pte)           |                                                                                     |
| HK1086395 A1    | 20260526 | PEXP |       | Calculated Patent Term Expiry                  |                                                                                     |
| HK1086395 A3    | 20060915 | LSPB | +     | published / reissued                           |                                                                                     |
| IN00961MN2005 A | 20060519 | LSPB | +     | published / reissued                           |                                                                                     |
| IN210477 B      | 20070315 | LSGT | +     | granted / extensions (spc, cpc, pte)           |                                                                                     |
| IN210477 B      | 20250830 | PEXP |       | Calculated Patent Term Expiry                  |                                                                                     |
| JP2006514488 T2 | 20060427 | LSPB | +     | published / reissued                           |                                                                                     |
| JP2006514488 T2 | 20060228 | LSRE | A521  | WRITTEN AMENDMENT                              | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20060227         |
| JP2006514488 T2 | 20060228 | LSES | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION    | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20060227         |
| JP2006514488 T2 | 20071117 | LSAS | A711  | NOTIFICATION OF CHANGE IN APPLICANT            | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A711<br>EFFECTIVE DATE : 20071116         |
| JP2006514488 T2 | 20071214 | LSRE | A521  | WRITTEN AMENDMENT                              | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A821<br>EFFECTIVE DATE : 20071116         |
| JP2006514488 T2 | 20080124 | LSRE | A521  | WRITTEN AMENDMENT                              | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20080123         |
| JP2006514488 T2 | 20090609 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL            | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20090609         |
| JP2006514488 T2 | 20091110 | LSRE | A521  | WRITTEN AMENDMENT                              | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20091109         |
| JP2006514488 T2 | 20100210 | LSRV | -A02  | DECISION OF REFUSAL                            | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A02<br>EFFECTIVE DATE : 20100209          |
| JP2006514488 T2 | 20100210 | LSRV | -A02  | DECISION OF REFUSAL                            | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A02<br>EFFECTIVE DATE : 20100209          |
| KR100978878 B1  | 20100831 | LSGT | +     | granted / extensions (spc, cpc, pte)           |                                                                                     |
| KR100978878 B1  | 20070503 | LSAS | N231  | NOTIFICATION OF CHANGE OF APPLICANT            |                                                                                     |
| KR100978878 B1  | 20080115 | LSES | A201  | REQUEST FOR EXAMINATION                        |                                                                                     |

|                 |          |       |       |                                                   |                                                                        |
|-----------------|----------|-------|-------|---------------------------------------------------|------------------------------------------------------------------------|
| KR100978878 B1  | 20091023 | LSSES | -E902 | NOTIFICATION OF REASON FOR REFUSAL                |                                                                        |
| KR100978878 B1  | 20100623 | LSGT  | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT |                                                                        |
| KR100978878 B1  | 20100824 | LSGT  | +GRNT | WRITTEN DECISION TO GRANT                         |                                                                        |
| KR100978878 B1  | 20130808 | LSFE  | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20130809<br>YEAR OF FEE PAYMENT : 4                     |
| KR100978878 B1  | 20140805 | LSFE  | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20140806<br>YEAR OF FEE PAYMENT : 5                     |
| KR100978878 B1  | 20150805 | LSFE  | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20150806<br>YEAR OF FEE PAYMENT : 6                     |
| KR100978878 B1  | 20160809 | LSFE  | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20160810<br>YEAR OF FEE PAYMENT : 7                     |
| KR100978878 B1  | 20170810 | LSFE  | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20170811<br>YEAR OF FEE PAYMENT : 8                     |
| KR100978878 B1  | 20230226 | PEXP  |       | Calculated Patent Term Expiry                     |                                                                        |
| KR20050102680 A | 20051026 | LSPB  | +     | published / reissued                              |                                                                        |
| MXPA05009144 A1 | 20051020 | LSPB  | +     | published / reissued                              |                                                                        |
| MXPA05009144 A1 | 20070724 | LSAS  | GB    | TRANSFER OR ASSIGNMENT                            |                                                                        |
| WO04079946 A1   | 20040916 | LSPB  | +     | published / reissued                              |                                                                        |
| WO04079946 A1   | 20050823 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE       | REF DOCUMENT NUMBER : 2516967<br>COUNTRY OF REF DOCUMENT : CA          |
| WO04079946 A1   | 20050823 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE       | REF DOCUMENT NUMBER : 2003716225<br>COUNTRY OF REF DOCUMENT : EP       |
| WO04079946 A1   | 20050823 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE       | REF DOCUMENT NUMBER : 2004569156<br>COUNTRY OF REF DOCUMENT : JP       |
| WO04079946 A1   | 20050825 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE       | REF DOCUMENT NUMBER : 1020057015804<br>COUNTRY OF REF DOCUMENT : KR    |
| WO04079946 A1   | 20050825 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE       | REF DOCUMENT NUMBER : 2003219940<br>COUNTRY OF REF DOCUMENT : AU       |
| WO04079946 A1   | 20050826 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE       | REF DOCUMENT NUMBER : PA/A/2005/009144<br>COUNTRY OF REF DOCUMENT : MX |
| WO04079946 A1   | 20051019 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE       | REF DOCUMENT NUMBER : 20038263378<br>COUNTRY OF REF DOCUMENT : CN      |
| WO04079946 A1   | 20051026 | LSPB  | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE    | REF DOCUMENT NUMBER : 1020057015804<br>COUNTRY OF REF DOCUMENT : KR    |
| WO04079946 A1   | 20051123 | LSPB  | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE    | REF DOCUMENT NUMBER : 2003716225<br>COUNTRY OF REF DOCUMENT : EP       |
| WO04079946 A1   | 20060221 | LSNP  | ENP   | ENTRY INTO THE NATIONAL PHASE IN:                 | REF DOCUMENT NUMBER : PI0318162<br>COUNTRY OF REF DOCUMENT : BR        |
| WO04079946 A1   | 20070815 | LSGT  | +WWG  | WIPO INFORMATION: GRANT IN NATIONAL OFFICE        | REF DOCUMENT NUMBER : 2003716225<br>COUNTRY OF REF DOCUMENT : EP       |



**Title:** Method and device for letting out gas from life jackets of divers

**Abstract:** Source: US5749679A PCT No. PCT/EP94/02719 Sec. 371 Date Feb. 20, 1996 Sec. 102(e) Date Feb. 20, 1996 PCT Filed Aug. 16, 1994 PCT Pub. No. WO95/05306 PCT Pub. Date Feb. 23, 1995A method and a device for letting out gas from a life jacket for divers, the device being adapted to be in gas flow communication with an interior of the life jacket. Gas is drawn into the device from the interior of the life jacket, compressed in the device, and discharged from the device to a medium surrounding the device.

**Classifications:**

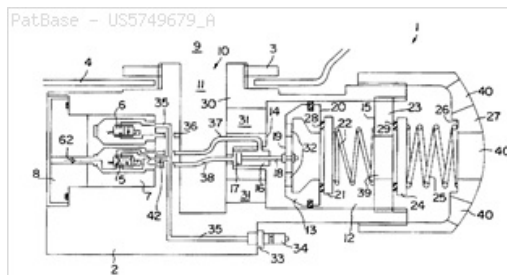
**International (IPC 8-9):** B63C11/08 (Advanced/Invention); B63C11/02 (Core/Invention)

**International (IPC 1-7):** B63C11/02 B63C11/08 B63C9/125 F16K15/20

**CPC:** B63C11/08

**European:** B63C11/08

**US:** 405/186 405/192 405/193



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT186505 E         | 19991115         | AT19940926839T     | 19940816         |
| AU199476534 A1     | 19950314         | AU19940076534      | 19940816         |
| AU678855 B2        | 19970612         | AU19940076534      | 19940816         |
| DE4425223 A1       | 19950223         | DE19944425223      | 19940716         |
| DE59408922 D1      | 19991216         | DE19945008922      | 19940816         |
| EP0762970 A1       | 19970319         | EP19940926839      | 19940816         |
| EP0762970 B1       | 19991110         | EP19940926839      | 19940816         |
| ES2141838 T3       | 20000401         | ES19940926839T     | 19940816         |
| US5749679 A        | 19980512         | US19960596227      | 19960214         |
| WO9505306 A1       | 19950223         | WO1994EP02719      | 19940816         |

**Priority:**

DE19934327833 19930819 DE19944425223 19940716 WO1994EP02719 19940816  
DE19945008922 19940816

**Probable Assignee:** GFT GES F TAUCHTECHNIK MBH

**Assignee(s):** (std): GFT GES F TAUCHTECHNIK MBH ; GFT GES FUER TAUCHTECHNIK MBH ; GFT GES FUR TAUCHTECHNIK MBH AND ; TOLKSDORF DETLEF ; KROMP THOMAS ; DETLEF TOLKSDORF ; THOMAS KROMP ; THOMAS KRAMP

**Assignee(s):** GFT GESELLSCHAFT FUR TAUCHTECHNIK MBH AND CO KG ; GFT GES F ; TOLKSDORF DETLEF HERTZLERSTRASSE ; TOLKSDORF DETLEF 45141 ESSEN DE ; KROMP THOMAS 45277 ESSEN DE ; GFT GES FUR TAUCHTECHNIK MBH AND CO KG ; GFT GESELLSCHAFT FUER TAUCHTECHNIK MBH AND CO KG

**Inventor(s):** (std): KROMP THOMAS

**Inventor(s):** THOMAS KROMP ; KROMP THOMAS 45277 ESSEN DE

**Agent(s):** FB RICE; FB RICE PTY LTD

**Designated states:** AT AU BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE US

**Legal status (INPADOC)**

View legal status timeline

| Patent        | Date recorded | Event group | Code  | Event                                       | Details                                                           |
|---------------|---------------|-------------|-------|---------------------------------------------|-------------------------------------------------------------------|
| AT186505 E    | 19991115      | LSGT        | +     | granted / extensions (spc, cpc, pte)        |                                                                   |
| AT186505 E    | 20040515      | LSLE        | -REN  | CEASED DUE TO NON-PAYMENT OF THE ANNUAL FEE |                                                                   |
| AT186505 E    | 20140816      | PEXP        |       | Calculated Patent Term Expiry               |                                                                   |
| AU678855 B2   | 20140816      | PEXP        |       | Calculated Patent Term Expiry               |                                                                   |
| DE4425223 A1  | 19950223      | LSPB        | +     | published / reissued                        |                                                                   |
| DE4425223 A1  | 19971211      | LSAS        | 8127  | NEW PERSON/NAME/ADDRESS OF THE APPLICANT    | OWNER NAME : GFT GESELLSCHAFT FUER TAUCHTECHNIK MBH AND CO. KG, 4 |
| DE4425223 A1  | 20011011      | LSLE        | -8141 | DISPOSAL/NO REQUEST FOR EXAMINATION         |                                                                   |
| DE59408922 D1 | 20001130      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION     |                                                                   |
| DE59408922 D1 | 20050609      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE        |                                                                   |
| EP0762970 A1  | 19970319      | LSPB        | +     | published / reissued                        |                                                                   |

|              |          |       |       |                                                                                                          |                                                                                                                                                                                             |
|--------------|----------|-------|-------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP0762970 A1 | 19970319 | LSSES | +17P  | REQUEST FOR EXAMINATION FILED                                                                            | EFFECTIVE DATE : 19960619                                                                                                                                                                   |
| EP0762970 A1 | 19971105 | LSAS  | RAP1  | TRANSFER OF RIGHTS OF AN EP PUBLISHED APPLICATION                                                        | OWNER NAME : GFT GESELLSCHAFT FUER TAUCHTECHNIK MBH AND CO. KG                                                                                                                              |
| EP0762970 A1 | 19980128 | LSSES | +17Q  | FIRST EXAMINATION REPORT                                                                                 | EFFECTIVE DATE : 19971210                                                                                                                                                                   |
| EP0762970 A1 | 19991110 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : GR<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 19991110                                                                                |
| EP0762970 A1 | 19991110 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : SE<br>DESCRIPTION : THE PATENT HAS BEEN ANNULLED BY A DECISION OF A NATIONAL AUTHORITY<br>EFFECTIVE DATE : 19991110                                                      |
| EP0762970 A1 | 19991110 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : NL<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 19991110  |
| EP0762970 A1 | 19991115 | LSNP  | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                                                                                                                          |
| EP0762970 A1 | 20000126 | LSGT  | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : FG4D<br>DESCRIPTION : GERMAN                                                                                                                |
| EP0762970 A1 | 20000210 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : DK<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20000210  |
| EP0762970 A1 | 20000210 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : PT<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20000210  |
| EP0762970 A1 | 20000401 | LSGT  | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FG2A<br>REF DOCUMENT NUMBER : 2141838<br>COUNTRY OF REF DOCUMENT : ES<br>KIND CODE OF REF DOCUMENT : T3<br>FORMAT OF REF DOCUMENT (F/P) : P |
| EP0762970 A1 | 20000403 | LSLE  | -NLV1 | NL: LAPSED OR ANNULLED DUE TO FAILURE TO FULFILL THE REQUIREMENTS OF ART. 29P AND 29M OF THE PATENTS ACT |                                                                                                                                                                                             |
| EP0762970 A1 | 20000816 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : LU<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20000816                                                                                |
| EP0762970 A1 | 20001025 | LSGT  | +26N  | NO OPPOSITION FILED                                                                                      |                                                                                                                                                                                             |
| EP0762970 A1 | 20020717 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : IE<br>PAYMENT DATE : 20020717<br>YEAR OF FEE PAYMENT : 09                                                                                                                |
| EP0762970 A1 | 20020717 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : CH<br>PAYMENT DATE : 20020717<br>YEAR OF FEE PAYMENT : 09                                                                                                                |
| EP0762970 A1 | 20020729 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : AT<br>PAYMENT DATE : 20020729<br>YEAR OF FEE PAYMENT : 09                                                                                                                |

|              |          |      |       |                                                                                       |                                                                                                              |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| EP0762970 A1 | 20020801 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : BE<br>PAYMENT DATE : 20020801<br>YEAR OF FEE PAYMENT : 09                                 |
| EP0762970 A1 | 20030816 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : AT<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20030816 |
| EP0762970 A1 | 20030818 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : IE<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20030818 |
| EP0762970 A1 | 20030831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : LI<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20030831 |
| EP0762970 A1 | 20030831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : BE<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20030831 |
| EP0762970 A1 | 20030831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : CH<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20030831 |
| EP0762970 A1 | 20030905 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20030905<br>YEAR OF FEE PAYMENT : 10                                 |
| EP0762970 A1 | 20030919 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : FR<br>PAYMENT DATE : 20030919<br>YEAR OF FEE PAYMENT : 10                                 |
| EP0762970 A1 | 20030922 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : ES<br>PAYMENT DATE : 20030922<br>YEAR OF FEE PAYMENT : 10                                 |
| EP0762970 A1 | 20030925 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20030925<br>YEAR OF FEE PAYMENT : 10                                 |
| EP0762970 A1 | 20040229 | LSLE | -BERE | BE: LAPSED                                                                            | OWNER NAME : G.- FUR TAUCHTECHNIK M.B.H. AND CO. K.G. *GFT<br>EFFECTIVE DATE : 20030831                      |
| EP0762970 A1 | 20040415 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                           |
| EP0762970 A1 | 20040602 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : MM4A                                                         |
| EP0762970 A1 | 20040816 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20040816 |
| EP0762970 A1 | 20040817 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : ES<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20040817 |
| EP0762970 A1 | 20050301 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20050301 |
| EP0762970 A1 | 20050406 | LSLE | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                         | EFFECTIVE DATE : 20040816                                                                                    |
| EP0762970 A1 | 20050429 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : FR<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20050429 |
| EP0762970 A1 | 20050603 | LSLE | REG   | REFERENCE TO A                                                                        | REF COUNTRY CODE : FR                                                                                        |

|              |          |      |       | NATIONAL CODE                                                                         | REF LEGAL EVENT CODE : ST                                                                                                                                                                                                  |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP0762970 A1 | 20050816 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : IT<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20050816                                                                                                               |
| EP0762970 A1 | 20051116 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FD2A<br>EFFECTIVE DATE : 20040817                                                                                                                                          |
| EP0762970 B1 | 19991110 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                                            |
| EP0762970 B1 | 20140816 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                                                            |
| ES2141838 T3 | 20000401 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                                            |
| ES2141838 T3 | 20000401 | LSGT | +FG2A | DEFINITIVE PROTECTION                                                                 | REF DOCUMENT NUMBER : 762970<br>COUNTRY OF REF DOCUMENT : ES                                                                                                                                                               |
| ES2141838 T3 | 20140816 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                                                            |
| US5749679 A  | 19980512 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                                            |
| US5749679 A  | 19960214 | LSAS | AS    | ASSIGNMENT                                                                            | OWNER NAME : KROMP, THOMAS, GERMANY<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:KROMP, THOMAS;<br>REEL/FRAME:007896/0245<br>EFFECTIVE DATE : 19950927                                                   |
| US5749679 A  | 19960214 | LSAS | AS    | ASSIGNMENT                                                                            | OWNER NAME : TOLKSDORF, DETLEF, GERMANY<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:KROMP, THOMAS;<br>REEL/FRAME:007896/0245<br>EFFECTIVE DATE : 19950927                                               |
| US5749679 A  | 19970724 | LSAS | AS    | ASSIGNMENT                                                                            | OWNER NAME : GFT GESELLSCHAFT FUER TAUCHTECHNIK MBH AND CO. KG, G<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:TOLKSDORF, DETLEF; KROMP, THOMAS;<br>REEL/FRAME:008623/0023<br>EFFECTIVE DATE : 19970630 |
| US5749679 A  | 20011022 | LSFE | +FPAY | FEE PAYMENT                                                                           | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                    |
| US5749679 A  | 20060512 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                                             |                                                                                                                                                                                                                            |
| US5749679 A  | 20060614 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362               |                                                                                                                                                                                                                            |
| US5749679 A  | 20060711 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                                         | EFFECTIVE DATE : 20060512                                                                                                                                                                                                  |
| US5749679 A  | 20160214 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                                                            |
| WO9505306 A1 | 19950223 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                                                            |
| WO9505306 A1 | 19960212 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                                           | REF DOCUMENT NUMBER : 1994926839<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                           |
| WO9505306 A1 | 19960214 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                                           | REF DOCUMENT NUMBER : 08596227<br>COUNTRY OF REF DOCUMENT : US                                                                                                                                                             |
| WO9505306 A1 | 19970319 | LSPB | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE                                        | REF DOCUMENT NUMBER : 1994926839<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                           |
| WO9505306 A1 | 19991110 | LSGT | +WWG  | WIPO INFORMATION: GRANT IN NATIONAL OFFICE                                            | REF DOCUMENT NUMBER : 1994926839<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                           |



**Title:** Redundantes elektronisches Schaltungs- und Handhabungssystem mit Kraftueckkopplung zur Fuehrung von Aktuatoren von Lenk-, Brems-, Beschleunigungs- und Handhabungssystemen von Fahrzeugen und Maschinen

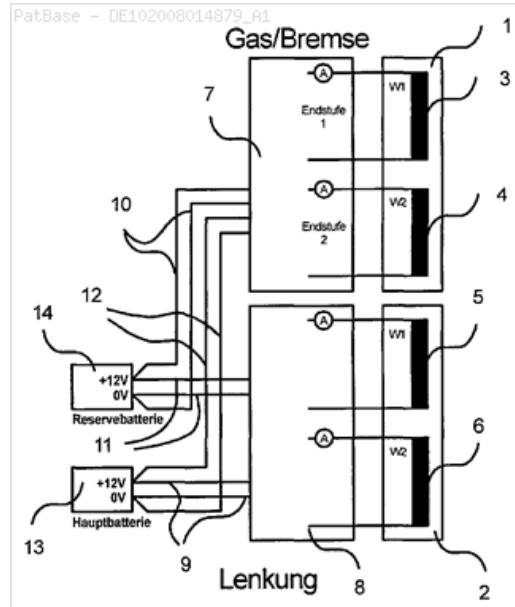
**Abstract:** The system has a force feedback coupler for force and position regulation and guidance of actuators, engines and valves of a gas system, brake system, steering system and handling system of vehicles to land, water, air and other machines and handling devices. A control unit produces recognition and tactility of position of wheel adjustment and possibility of output force. Electronic control units have two simultaneously running monitoring microcontroller systems. A backup accumulator has a load, control/diagnostic and communication interface for communicating with a central controller. An independent claim is also included for a method for force feedback coupling, regulating, positioning and position regulation.

**Classifications:**

**International (IPC 8-9):** B60W10/04 B60W10/20 B60W40/00 B60W50/02 (Advanced/Invention)

**CPC:** B60K26/021 B60W50/02

**European:** B60K26/02B B60W50/02



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE102008014879 A1  | 20090917         | DE200810014879     | 20080312         |
| DE102008014879 A8  | 20091210         | DE200810014879     | 20080312         |

**Priority:**

DE200810014879 20080312

**Probable Assignee:**

WELDIN DAVID

**Assignee(s): (std):**

WELDIN DAVID

**Inventor(s): (std):**

WELDIN ANTON

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code  | Event                                                                               | Details                   |
|-------------------|---------------|-------------|-------|-------------------------------------------------------------------------------------|---------------------------|
| DE102008014879 A1 | 20090917      | LSPB        | +     | published / reissued                                                                |                           |
| DE102008014879 A1 | 20091210      | LSRE        | 8196  | REPRINT OF FAULTY TITLE PAGE (PUBLICATION) GERMAN PATENTBLATT: PART 1A6             |                           |
| DE102008014879 A1 | 20140109      | LSDW        | -R119 | APPLICATION DEEMED WITHDRAWN, OR IP RIGHT LAPSED, DUE TO NON-PAYMENT OF RENEWAL FEE | EFFECTIVE DATE : 20131001 |

**Title:** DISPENSING DEVICE INCLUDING A MOVABLE SPRAY HEAD AND A STATIONARY BASE AS WELL AS A MINIATURE ELECTRIC PUMP

**Abstract:** Source: US2012158193A The invention relates to a packaging and dispensing device for a liquid or semi-liquid product, including: a movable spray head including at least one container supplying an outlet member; and at least one stationary base including a second container which can be connected to the above-mentioned first container via coupling element so that the product can be transferred from the second container in the base to the first container in the movable spray head in order for at least the product in the movable spray head to be refilled. The invention is characterised in that a miniature electric pump, known as a transfer pump, powered by an electrical power supply element and **controlled** by a **control** element, is disposed between the first and second containers to allow the product to be conveyed through the coupling element.

### Classifications:

**International (IPC 8-9):** A47K5/12 B05B11/00 B05B9/03 B05B9/04  
B05B9/043 B05B9/08 B65D83/76 B67C3/02 F16L33/00

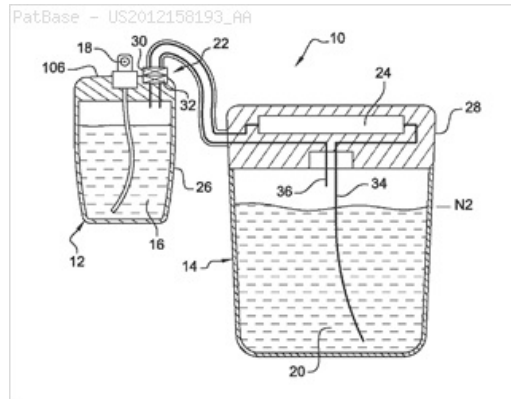
G05D7/00 (Advanced/Invention);

B05B9/043 B05B9/08 (Advanced/Non-invention)

**CPC:** B05B9/0403 A47K5/1217 B05B9/0426 B05B9/043 B05B9/0861  
B05B11/0037 B05B11/0056

**European:** A47K5/12E B05B11/00B5 B05B11/00B5F B05B9/04B  
L05B9/043 L05B9/04B15 L05B9/08C1A

**US:** 141/113 141/285 141/380 141/67 215/2 700/283 700/283P



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| BR112012005121 A2  | 20160503         | BR20121105121      | 20100906         |
| CN102574141 A      | 20120711         | CN201080047005     | 20100906         |
| DE602010025584 D1  | 20150813         | DE201060025584T    | 20100906         |
| EP2475464 A1       | 20120718         | EP20100760627      | 20100906         |
| EP2475464 B1       | 20150701         | EP20100760627      | 20100906         |
| ES2546761 T3       | 20150928         | ES20100760627T     | 20100906         |
| FR2949764 A1       | 20110311         | FR20090056060      | 20090907         |
| FR2949764 B1       | 20111125         | FR20090056060      | 20090907         |
| JP2013503790 T2    | 20130204         | JP20120527345T     | 20100906         |
| US2012158193 AA    | 20120621         | US20100393990      | 20100906         |
| US8950447 BB       | 20150210         | US20100393990      | 20100906         |
| WO11026969 A1      | 20110310         | WO2010EP63028      | 20100906         |

**Priority:**

EP20100760627 20100906      FR20090056060 20090907      WO2010EP63028 20100906

**Probable Assignee:** ABN CONCEPT

**Assignee(s):** (std): ABN CONCEPT ; DE ROSA DANIEL ; LABLAINE BRUNO ; MAITRISE AND INNOVATION ; MAITRISE ET INNOVATION

**Inventor(s):** (std): BRUNO LABLAINE ; DANIEL DE ROSA ; DE ROSA DANIEL ; LABLAINE BRUNO ; ROSA DANIEL DE

**Agent(s):** CABINET CHAILLOT; KOHN PHILIPPE; CHAILLOT GENEVIEVE; TOMAS TESIFONTE ENRIQUE; PISTIL;  
YOUNG AND THOMPSON

**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU  
CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL  
IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT  
MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST  
SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VV VN ZA ZM ZW

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code | Event                                                                       | Details                   |
|-------------------|---------------|-------------|------|-----------------------------------------------------------------------------|---------------------------|
| BR112012005121 A2 | 20160503      | LSPB        | +    | published / reissued                                                        |                           |
| CN102574141 A     | 20120711      | LSPB        | +    | published / reissued                                                        |                           |
| CN102574141 A     | 20120711      | LSPB        | +C06 | PUBLICATION                                                                 |                           |
| CN102574141 A     | 20150401      | LSDW        | -C02 | DEEMED WITHDRAWAL OF PATENT APPLICATION AFTER PUBLICATION (PATENT LAW 2001) |                           |
| EP2475464 A1      | 20120718      | LSPB        | +    | published / reissued                                                        |                           |
| EP2475464 A1      | 20120718      | LSES        | +17P | REQUEST FOR                                                                 | EFFECTIVE DATE : 20120504 |

|              |          |       |       |                                                                                 |                                                                                                                                                                                                                     |
|--------------|----------|-------|-------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP2475464 A1 | 20120815 | LSSES | +R17P | EXAMINATION<br>FILED<br><br>REQUEST FOR<br>EXAMINATION<br>FILED<br>(CORRECTION) | EFFECTIVE DATE : 20120410                                                                                                                                                                                           |
| EP2475464 A1 | 20141210 | LSRE  | RIC1  | CLASSIFICATION<br>(CORRECTION)                                                  | CLASSIFICATIONSCHEME : IPC<br>CLASSIFICATIONSYMBOL : B05B<br>9/043<br>20060101ALN20141104BHEP                                                                                                                       |
| EP2475464 A1 | 20141210 | LSRE  | RIC1  | CLASSIFICATION<br>(CORRECTION)                                                  | CLASSIFICATIONSCHEME : IPC<br>CLASSIFICATIONSYMBOL : B05B<br>11/00<br>20060101ALI20141104BHEP                                                                                                                       |
| EP2475464 A1 | 20141210 | LSRE  | RIC1  | CLASSIFICATION<br>(CORRECTION)                                                  | CLASSIFICATIONSCHEME : IPC<br>CLASSIFICATIONSYMBOL : B05B<br>9/04<br>20060101AFI20141104BHEP                                                                                                                        |
| EP2475464 A1 | 20141210 | LSRE  | RIC1  | CLASSIFICATION<br>(CORRECTION)                                                  | CLASSIFICATIONSCHEME : IPC<br>CLASSIFICATIONSYMBOL : F16L<br>33/00<br>20060101ALI20141104BHEP                                                                                                                       |
| EP2475464 A1 | 20141210 | LSRE  | RIC1  | CLASSIFICATION<br>(CORRECTION)                                                  | CLASSIFICATIONSCHEME : IPC<br>CLASSIFICATIONSYMBOL : A47K<br>5/12<br>20060101ALI20141104BHEP                                                                                                                        |
| EP2475464 A1 | 20141210 | LSRE  | RIC1  | CLASSIFICATION<br>(CORRECTION)                                                  | CLASSIFICATIONSCHEME : IPC<br>CLASSIFICATIONSYMBOL : B05B<br>9/08<br>20060101ALN20141104BHEP                                                                                                                        |
| EP2475464 A1 | 20150128 | LSGT  | +INTG | ANNOUNCEMENT<br>OF INTENTION<br>TO GRANT                                        | EFFECTIVE DATE : 20150108                                                                                                                                                                                           |
| EP2475464 A1 | 20160129 | LSFE  | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                      | COUNTRY OF REF DOCUMENT :<br>DE<br>PAYMENT DATE : 20151124<br>YEAR OF FEE PAYMENT : 6                                                                                                                               |
| EP2475464 A1 | 20160229 | LSFE  | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                      | COUNTRY OF REF DOCUMENT :<br>ES<br>PAYMENT DATE : 20151123<br>YEAR OF FEE PAYMENT : 6                                                                                                                               |
| EP2475464 A1 | 20161031 | LSFE  | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                      | COUNTRY OF REF DOCUMENT :<br>GB<br>PAYMENT DATE : 20160922<br>YEAR OF FEE PAYMENT : 7                                                                                                                               |
| EP2475464 A1 | 20161130 | LSFE  | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                      | COUNTRY OF REF DOCUMENT :<br>FR<br>PAYMENT DATE : 20160926<br>YEAR OF FEE PAYMENT : 7                                                                                                                               |
| EP2475464 B1 | 20150701 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)                                      |                                                                                                                                                                                                                     |
| EP2475464 B1 | 20150701 | LSGT  | REG   | REFERENCE TO A<br>NATIONAL CODE                                                 | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D<br>TEXT : NOT ENGLISH                                                                                                                                          |
| EP2475464 B1 | 20150715 | LSNP  | REG   | REFERENCE TO A<br>NATIONAL CODE                                                 | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                                                                                                                                                  |
| EP2475464 B1 | 20150715 | LSNP  | REG   | REFERENCE TO A<br>NATIONAL CODE                                                 | REF COUNTRY CODE : AT<br>REF LEGAL EVENT CODE : REF<br>REF DOCUMENT NUMBER :<br>733631<br>COUNTRY OF REF DOCUMENT :<br>AT<br>KIND CODE OF REF DOCUMENT :<br>T<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20150715 |
| EP2475464 B1 | 20150812 | LSGT  | REG   | REFERENCE TO A<br>NATIONAL CODE                                                 | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : FG4D<br>TEXT : LANGUAGE OF EP<br>DOCUMENT: FRENCH                                                                                                                   |
| EP2475464 B1 | 20150813 | LSPB  | REG   | REFERENCE TO A<br>NATIONAL CODE                                                 | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R096<br>REF DOCUMENT NUMBER :<br>602010025584<br>COUNTRY OF REF DOCUMENT :<br>DE                                                                                    |

|              |          |      |       |                                                                                       |                                                                                                                                                                                                               |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP2475464 B1 | 20150928 | LSGT | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FG2A<br>REF DOCUMENT NUMBER : 2546761<br>COUNTRY OF REF DOCUMENT : ES<br>KIND CODE OF REF DOCUMENT : T3<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20150928 |
| EP2475464 B1 | 20151115 | LSRV | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : AT<br>REF LEGAL EVENT CODE : MK05<br>REF DOCUMENT NUMBER : 733631<br>COUNTRY OF REF DOCUMENT : AT<br>KIND CODE OF REF DOCUMENT : T<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20150701   |
| EP2475464 B1 | 20151118 | LSFE | REG   | REFERENCE TO A NATIONAL CODE                                                          | COUNTRY OF REF DOCUMENT : FR<br>REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 6                                                                                               |
| EP2475464 B1 | 20151228 | LSRV | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : LT<br>REF LEGAL EVENT CODE : MG4D                                                                                                                                                          |
| EP2475464 B1 | 20160129 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : LV<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20150701        |
| EP2475464 B1 | 20160129 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : LT<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20150701        |
| EP2475464 B1 | 20160129 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : GR<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20151002        |
| EP2475464 B1 | 20160129 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : FI<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20150701        |
| EP2475464 B1 | 20160129 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : NO<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20151001        |
| EP2475464 B1 | 20160229 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : AT<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20150701        |
| EP2475464 B1 | 20160229 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT                                 | COUNTRY OF REF DOCUMENT : HR<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE                                                                                                 |

|              |          |      |       |                                                                                                            |                                                                                                                                                                                                                          |
|--------------|----------|------|-------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | INFORM. FROM<br>NAT. OFFICE TO<br>EPO                                                                      | DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20150701                                                                                                                           |
| EP2475464 B1 | 20160229 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>PL<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20150701 |
| EP2475464 B1 | 20160229 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>IS<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20151101 |
| EP2475464 B1 | 20160229 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>SE<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20150701 |
| EP2475464 B1 | 20160229 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>PT<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20151102 |
| EP2475464 B1 | 20160404 | LSRE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                            | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R097<br>REF DOCUMENT NUMBER :<br>602010025584<br>COUNTRY OF REF DOCUMENT :<br>DE                                                                                         |
| EP2475464 B1 | 20160429 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>LU<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20150906 |
| EP2475464 B1 | 20160429 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>CZ<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20150701 |
| EP2475464 B1 | 20160429 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>MC<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20150701 |
| EP2475464 B1 | 20160429 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>IT<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20150701 |
| EP2475464 B1 | 20160429 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM                          | COUNTRY OF REF DOCUMENT :<br>DK<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE                                                                      |

|              |          |      |       |                                                                                       |                                                                                                                                                                                                          |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | NAT. OFFICE TO EPO                                                                    | FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20150701                                                                                                                                           |
| EP2475464 B1 | 20160429 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : SK<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20150701 |
| EP2475464 B1 | 20160429 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : EE<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20150701 |
| EP2475464 B1 | 20160429 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                                       |
| EP2475464 B1 | 20160531 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : RO<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20150701 |
| EP2475464 B1 | 20160608 | LSGT | +26N  | NO OPPOSITION FILED                                                                   | EFFECTIVE DATE : 20160404                                                                                                                                                                                |
| EP2475464 B1 | 20160629 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : MM4A                                                                                                                                                     |
| EP2475464 B1 | 20160729 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : IE<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20150906                                                                               |
| EP2475464 B1 | 20160729 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : LI<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20150930                                                                               |
| EP2475464 B1 | 20160729 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : CH<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20150930                                                                               |
| EP2475464 B1 | 20160831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : SI<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20150701 |
| EP2475464 B1 | 20160926 | LSFE | REG   | REFERENCE TO A NATIONAL CODE                                                          | COUNTRY OF REF DOCUMENT : FR<br>REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 7                                                                                          |
| EP2475464 B1 | 20161230 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : ES<br>PAYMENT DATE : 20160922<br>YEAR OF FEE PAYMENT : 7                                                                                                                       |
| EP2475464 B1 | 20170131 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20160927<br>YEAR OF FEE PAYMENT : 7                                                                                                                       |
| EP2475464 B1 | 20170331 | LSLE | -PG25 | LAPSED IN A CONTRACTING                                                               | COUNTRY OF REF DOCUMENT : MT                                                                                                                                                                             |

|              |          |      |       |                                                                                                            |                                                                                                                                                                                                                                             |
|--------------|----------|------|-------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO                               | NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20150701                                                       |
| EP2475464 B1 | 20170531 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>BG<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20150701                    |
| EP2475464 B1 | 20170531 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>HU<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT; INVALID AB INITIO<br>LAPSED DATE : 20100906 |
| EP2475464 B1 | 20170531 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>SM<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20150701                    |
| EP2475464 B1 | 20170630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>CY<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20150701                    |
| EP2475464 B1 | 20170630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>NL<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20150701                    |
| EP2475464 B1 | 20170731 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>BE<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF<br>DUE FEES<br>LAPSED DATE : 20150930                                                                                                           |
| EP2475464 B1 | 20170831 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>ANNOUNCED VIA<br>POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>TR<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20150701                    |
| EP2475464 B1 | 20170929 | LSFE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                            | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 8                                                                                                                                                             |
| EP2475464 B1 | 20171031 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT :<br>GB<br>PAYMENT DATE : 20170929<br>YEAR OF FEE PAYMENT : 8                                                                                                                                                       |
| EP2475464 B1 | 20171031 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES<br>PAID TO<br>NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT :<br>FR<br>PAYMENT DATE : 20170929<br>YEAR OF FEE PAYMENT : 8                                                                                                                                                       |
| EP2475464 B1 | 20300906 | PEXP |       | Calculated<br>Patent Term<br>Expiry                                                                        |                                                                                                                                                                                                                                             |
| ES2546761 T3 | 20150928 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                                 |                                                                                                                                                                                                                                             |

|                 |          |       |       |                                                         |                                                                                                                                                                                                             |
|-----------------|----------|-------|-------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ES2546761 T3    | 20300906 | PEXP  |       | Calculated<br>Patent Term<br>Expiry                     |                                                                                                                                                                                                             |
| FR2949764 A1    | 20110311 | LSPB  | +     | published /<br>reissued                                 |                                                                                                                                                                                                             |
| FR2949764 A1    | 20150925 | LSFE  | +PLFP | FEE PAYMENT                                             | YEAR OF FEE PAYMENT : 7                                                                                                                                                                                     |
| FR2949764 A1    | 20170630 | LSLE  | -ST   | NOTIFICATION<br>OF LAPSE                                | EFFECTIVE DATE : 20170531                                                                                                                                                                                   |
| FR2949764 B1    | 20111125 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)              |                                                                                                                                                                                                             |
| FR2949764 B1    | 20290907 | PEXP  |       | Calculated<br>Patent Term<br>Expiry                     |                                                                                                                                                                                                             |
| JP2013503790 T2 | 20130204 | LSPB  | +     | published /<br>reissued                                 |                                                                                                                                                                                                             |
| JP2013503790 T2 | 20130907 | LSSES | +A621 | WRITTEN<br>REQUEST FOR<br>APPLICATION<br>EXAMINATION    | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20130906                                                                                                                              |
| JP2013503790 T2 | 20140521 | LSSES | -A131 | NOTIFICATION<br>OF REASONS FOR<br>REFUSAL               | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20140520                                                                                                                              |
| JP2013503790 T2 | 20141022 | LSRV  | -A02  | DECISION OF<br>REFUSAL                                  | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A02<br>EFFECTIVE DATE : 20141021                                                                                                                               |
| US2012158193 AA | 20120621 | LSPB  | +     | published /<br>reissued                                 |                                                                                                                                                                                                             |
| US2012158193 AA | 20120307 | LSAS  | AS    | ASSIGNMENT                                              | OWNER NAME : ABN CONCEPT,<br>FRANCE<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:DE ROSA, DANIEL;<br>LABLAINE, BRUNO;<br>REEL/FRA:027820/0356<br>EFFECTIVE DATE : 20120221            |
| US2012158193 AA | 20120307 | LSAS  | AS    | ASSIGNMENT                                              | OWNER NAME : MAITRISE ET<br>INNOVATION, FRANCE<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:DE ROSA, DANIEL;<br>LABLAINE, BRUNO;<br>REEL/FRA:027820/0356<br>EFFECTIVE DATE : 20120221 |
| US8950447 BB    | 20150210 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)              |                                                                                                                                                                                                             |
| US8950447 BB    | 20150121 | LSGT  | PAT1  | Patented Case                                           |                                                                                                                                                                                                             |
| US8950447 BB    | 20300906 | PEXP  |       | Calculated<br>Patent Term<br>Expiry                     |                                                                                                                                                                                                             |
| WO11026969 A1   | 20110310 | LSPB  | +     | published /<br>reissued                                 |                                                                                                                                                                                                             |
| WO11026969 A1   | 20120302 | LSNP  | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL<br>PHASE | REF DOCUMENT NUMBER :<br>13393990<br>COUNTRY OF REF DOCUMENT :<br>US                                                                                                                                        |
| WO11026969 A1   | 20120306 | LSNP  | ENP   | ENTRY INTO THE<br>NATIONAL PHASE<br>IN:                 | REF DOCUMENT NUMBER :<br>2012527345<br>COUNTRY OF REF DOCUMENT :<br>JP<br>KIND CODE OF REF DOCUMENT :<br>A                                                                                                  |
| WO11026969 A1   | 20120306 | LSNP  | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL<br>PHASE | REF DOCUMENT NUMBER :<br>2012527345<br>COUNTRY OF REF DOCUMENT :<br>JP                                                                                                                                      |
| WO11026969 A1   | 20120307 | LSNE  | NENP  | NON-ENTRY INTO<br>THE NATIONAL<br>PHASE IN:             | REF COUNTRY CODE : DE                                                                                                                                                                                       |
| WO11026969 A1   | 20160503 | LSNP  | ENP   | ENTRY INTO THE<br>NATIONAL PHASE<br>IN:                 | REF DOCUMENT NUMBER :<br>112012005121<br>COUNTRY OF REF DOCUMENT :<br>BR<br>KIND CODE OF REF DOCUMENT :<br>A2<br>EFFECTIVE DATE : 20120307                                                                  |

**Title:** PORTABLE OXYGEN ENRICHMENT DEVICE AND METHOD OF USE

**Abstract:** Source: US2013216627A Lightweight, small, portable devices and methods are disclosed that provide oxygen-enriched air using an ultra rapid adsorption cycle based on advanced molecular sieve materials.

**Classifications:**

**International (IPC 8-9):** A23L2/54 A61K33/00 A61L2/00 A61M16/10 A61M35/00 B01D53/047 B01D53/053 C02F1/78

F17D3/01 (Advanced/Invention);

A61L2/22 A61L9/14 B01D53/04 B01D53/047 (Advanced/Non-invention)

**CPC:** A61M16/10 B01D53/0446 B01D2253/108 B01D2256/12

B01D2259/4533 B01D2259/4541 A23L2/54 F17D3/01 A61K33/00

B01D2253/116 B01D2257/40 A23V2002/00 A61M35/00 B01D53/053

A61L2/22 A61L9/14 A61M16/101 A61M2205/8206 A61M2205/8237

A61M2205/8262 A61M2209/086 C02F1/78 Y10T137/0318

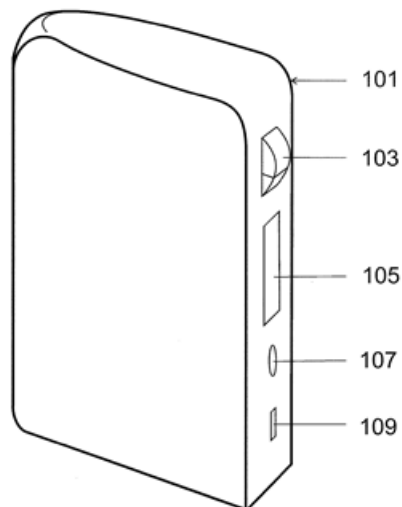
A61L2/0094 B01D2257/102 C02F2303/04 A61M2205/8293

B01D53/0473 B01D53/047

**US:** 137/1 210/748.19 239/569 424/600 426/477 604/23 95/130

95/19 95/22 95/26 96/113 96/121 96/130

PatBase - US2013216627\_AA



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2013216627 AA    | 20130822         | US20120586223      | 20120815         |
| US2015104524 AA    | 20150416         | US20140516919      | 20141017         |
| US2017021302 AA    | 20170126         | US20160248630      | 20160826         |
| US8888902 BB       | 20141118         | US20120586223      | 20120815         |
| US9492781 BB       | 20161115         | US20140516919      | 20141017         |

**Priority:**

US20110527706P 20110826 US20120586223 20120815 US20140516919 20141017  
US20160248630 20160826

**Probable Assignee:** SEPARATION DESIGN GROUP LLC

**Assignee(s):** (std): DEPETRIS ELISE N ; GALBRAITH JUDITH C ; GALBRAITH STEPHEN DOUGLAS ; MCGOWAN KENNETH J ; WALKER DAVID K ; SEPARATION DESIGN GROUP LLC

**Inventor(s):** (std): DEPETRIS ELISE N ; GALBRAITH JUDITH C ; GALBRAITH STEPHEN DOUGLAS ; MCGOWAN KENNETH J ; WALKER DAVID K

**Agent(s):** WENDY A; BALLARD SPAHR LLP

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code | Event                | Details                                                                                                                                                                                                                                                                 |
|-----------------|---------------|-------------|------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2013216627 AA | 20130822      | LSPB        | +    | published / reissued |                                                                                                                                                                                                                                                                         |
| US2013216627 AA | 20121010      | LSAS        | AS   | ASSIGNMENT           | OWNER NAME : SEPARATION DESIGN GROUP LLC, PENNSYLVANIA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS: GALBRAITH, STEPHEN DOUGLAS; WALKER, DAVID K.; MCGOWAN, KENNETH J.; AND OTHERS;<br>SIGNING DATES FROM 20120411 TO 20121002; REEL/FRA:029106/0185 |
| US2015104524 AA | 20150416      | LSPB        | +    | published / reissued |                                                                                                                                                                                                                                                                         |
| US2015104524 AA | 20141017      | LSAS        | AS   | ASSIGNMENT           | OWNER NAME : SEPARATION DESIGN GROUP LLC, PENNSYLVANIA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS: GALBRAITH, STEPHEN DOUGLAS; WALKER, DAVID K.; MCGOWAN, KENNETH J.; AND OTHERS;<br>SIGNING DATES FROM 20120411 TO 20121002; REEL/FRA:033971/0897 |
| US2017021302 AA | 20170126      | LSPB        | +    | published / reissued |                                                                                                                                                                                                                                                                         |
| US2017021302 AA | 20160826      | LSAS        | AS   | ASSIGNMENT           | PARTYTYPE : OWNER<br>OWNER : SEPARATION DESIGN GROUP LLC, PENNSYLVANIA                                                                                                                                                                                                  |

OLDPARTY : ASSIGNMENT OF  
 ASSIGNORS INTEREST;  
 ASSIGNORS: GALBRAITH, STEPHEN  
 DOUGLAS; WALKER, DAVID K.;  
 MCGOWAN, KENNETH J.; AND OTHERS;  
 SIGNING DATES FROM 20120411 TO  
 20121002; REEL/FRA: 039556/0333

|                 |          |      |      |                            |
|-----------------|----------|------|------|----------------------------|
| US2017021302 AA | 20171124 | LSES | NFA1 | Non Final<br>Action Mailed |
|-----------------|----------|------|------|----------------------------|

|                 |          |      |       |                                                   |
|-----------------|----------|------|-------|---------------------------------------------------|
| US2017021302 AA | 20171124 | LSES | -NFA2 | Non Final<br>Action<br>Counted, Not<br>Yet Mailed |
|-----------------|----------|------|-------|---------------------------------------------------|

|              |          |      |   |                                               |
|--------------|----------|------|---|-----------------------------------------------|
| US8888902 BB | 20141118 | LSGT | + | granted /<br>extensions<br>(spc, cpc,<br>pte) |
|--------------|----------|------|---|-----------------------------------------------|

|              |          |      |      |                  |
|--------------|----------|------|------|------------------|
| US8888902 BB | 20141029 | LSGT | PAT1 | Patented<br>Case |
|--------------|----------|------|------|------------------|

|              |          |      |  |                                                      |
|--------------|----------|------|--|------------------------------------------------------|
| US8888902 BB | 20321106 | PEXP |  | Calculated<br>Patent Term<br>Expiry (PTA<br>83 days) |
|--------------|----------|------|--|------------------------------------------------------|

|              |          |      |   |                                               |
|--------------|----------|------|---|-----------------------------------------------|
| US9492781 BB | 20161115 | LSGT | + | granted /<br>extensions<br>(spc, cpc,<br>pte) |
|--------------|----------|------|---|-----------------------------------------------|

|              |          |      |      |                  |
|--------------|----------|------|------|------------------|
| US9492781 BB | 20161026 | LSGT | PAT1 | Patented<br>Case |
|--------------|----------|------|------|------------------|

|              |          |      |  |                                     |
|--------------|----------|------|--|-------------------------------------|
| US9492781 BB | 20341017 | PEXP |  | Calculated<br>Patent Term<br>Expiry |
|--------------|----------|------|--|-------------------------------------|

**Title:** AUGEN-TONOMETER MIT UMSCHALTBARER ANDRUCKBELASTUNG, MIT ELEKTRISCHER ANALOGUND DIGITALANZEIGE DER MESSWERTE UND MIT AUSWECHSELBAREM APPLIKATIONSINSTRUMENTARIUM Tonometer with switchable ANDRUCKBELASTUNG EYES, WITH ELECTRICAL ANALOGUND DIGITAL DISPLAY OF MEASUREMENTS AND APPLICATION WITH INTERCHANGEABLE TOOLS (Machine translation)

**Abstract:** Source: DE2254157A1 Patentansprueche Augentonometer mit umschaltbarer Andrucksbelastung, mit elektrischer Analog- und Digitalanzeige der Messwerte und mit auswechselbarem Applikationsinstrumentarium dadurch gekennzeichnet, dass verschiedene Tonometergewichte waehrend der Applikation durch eine permanentmagnetische oder elektromagnetische umschaltbare Andrucksbelastung vorgewaeht werden, mechanisch-elektrisch oder mechanisch elektronisch gewandelte Messwerte als Druckwerte in mm Hg direkt analog oder digital angezeigt werden und ohne Beeintraechtigung der Tonometerempfindlichkeit und der Tonometergenauigkeit das Applikationsinstrumentarium ohne Geraete zerlegung auswechselbar ist 20 Geraet nach Anspruch 1 dadurch gekennzeichnet, dass ein Augentonometer mit einer umschaltbaren Andrucksbelastung fuer verschiedene Donometergewichte waehrend einer Applikation, mit einer wahlweisen elektrischen Analog- oder Digitalanzeige und mit einem auswechselbaren Applikationsinstrumentarium eine auf den medizinischen Forderungen basierende Geraetefunktionseinheit bildet 30 Geraet nach Anspruch 2 dadurch gekennzeichnet, dass ein einfaches Augentonometer mit umschaltbarer permanentmagnetischer Andrucksbelastung fuer verschiedene Tonometergewichte und mit auswechselbarem Applikationsinstrumentarium ausgelegt sein kann 40 Geraet nach Anspruch 3 dadurch gekennzeichnet, dass die Fuehrungshuelse des Augentonometers eine auswechselbare Fussplatte enthaelt 50 Geraet nach Anspruch, 3 dadurch gekennzeichnet, dass der Senkstift des Augentonometers an seinem unteren Ende einen auswechselbaren Senkstifteinsatz enthaelt 60 Geraet nach Anspruch 3 dadurch gekennzeichnet, dass eine umschaltbare Andrucksbelastung, die den erforderlichen verschiedenen Tonometergewichten entspricht, durch die Funktion zweier unabhaengiger auf dem Geraeterahmen des Tonometers befestigter Magnetschieber, die sich einseitig uebereinander angeordnet befinden, bewirkt wird 7.

**Machine translation:** CLAIMS eye tonometer with switchable Andrucksbelastung, with electrical analog and digital display of measured values and with interchangeable application of instruments wherein various Tonometergewichte be preselected during the application by a permanent magnet or electro-switchable Andrucksbelastung, mechanically-Elektrisch or mechanically electronically converted values as pressure values be displayed in mm Hg right analog or digital, without compromising the Tonometergenauigkeit Tonometerempfindlichkeit and the applicat ions disassemble without tools interchangeable 20 ist device according to claim 1 wherein one eye tonometer while a switchable Andrucksbelastung an application for different Donometergewichte, with an optional electrical analog or digital display and a removable application instrumentarium one based on the medical claims devices funktionseinheit 30 units is in accordance with claim 2, characterized in that a simple eye tonometer weights with switchable permanent magnets netic Andrucksbelastung for various tonometer and with replaceable Applikationsinstrumenta rium designed criterion be kann 40 device according to claim 3, characterized in that the Fuehrungshuelse of eye tonometer a removable footplate enthaelt 50 Sun device of claim, 3 wherein characterized in that the locking bolt of the eye tonometer at its lower end a replaceable Senkstifteinsatz enthaelt 60 Geraet according to claim 3 in that a reversible Andrucksbelastung that meets all of the various Tonometergewichten, is caused by the function of two independent devices on the part of the tonometer mounted solenoid valves, which are arranged one above the other side, 7

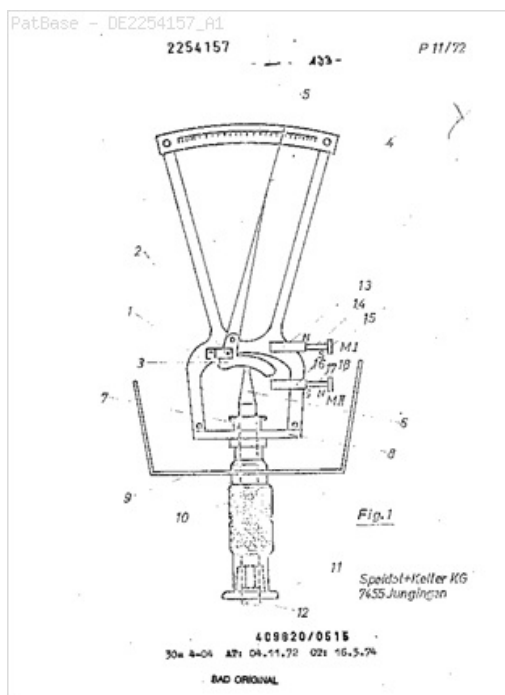
#### Classifications:

**International (IPC 8-9):** A61B3/16 (Advanced/Invention); A61B3/16 (Core/Invention)

**International (IPC 1-7):** A61B3/16

**CPC:** A61B3/16

**European:** A61B3/16



#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE2254157 A1       | 19740516         | DE19722254157      | 19721104         |
| DE2254157 B2       | 19740912         | DE19722254157      | 19721104         |
| DE2254157 C3       | 19750417         | DE19722254157      | 19721104         |

#### Priority:

DE19722254157 19721104

#### Probable Assignee:

SPEIDEL AND KELLER KG

#### Assignee(s): (std):

SPEIDEL AND KELLER KG

#### Assignee(s):

SPEIDEL AND KELLER KG 7455 JÜDINGEN

#### Inventor(s): (std):

SPEIDEL BLASIUS

#### Inventor(s):

SPEIDEL BLASIUS 7455 JÜDINGEN

**Legal status (INPADOC)**[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code | Event                                               | Details |
|--------------|---------------|-------------|------|-----------------------------------------------------|---------|
| DE2254157 A1 | 19740516      | LSPB        | +    | published / reissued                                |         |
| DE2254157 A1 | 19750417      | LSGT        | +C3  | GRANT AFTER TWO PUBLICATION STEPS (3RD PUBLICATION) |         |
| DE2254157 A1 | 19791004      | LSLE        | -EHJ | CEASED/NON-PAYMENT OF THE ANNUAL FEE                |         |
| DE2254157 B2 | 19740912      | LSPB        | +    | published / reissued                                |         |
| DE2254157 C3 | 19750417      | LSGT        | +    | granted / extensions (spc, cpc, pte)                |         |

**Title:** Device for regulating brake pressure

**Abstract:** Source: US6494546B The present invention relates to a device for brake pressure **control** in hydraulic brake systems of vehicles, wherein at least one measuring data emitter for the relative movement between the actuating device and the abutment or for the pedal force introduced into the simulator spring, one measuring data emitter for the position of a brake piston, and one measuring data emitter for the pressure in the brake circuit or between the **control valve** and the **housing**, wherein the hydraulic pressure fluid which flows from the pressure supply device by way of the **control valve** is exclusively fed into a chamber of the **housing** where it urges the abutment to bear against the stop, on the one hand, and applies pressure to at least one brake piston.

**Classifications:**

**International (IPC 8-9):** B60T13/12 B60T13/128 B60T17/22

B60T7/04 B60T8/40 (Advanced/Invention);

B60T13/10 B60T17/18 B60T7/04 B60T8/40 (Core/Invention)

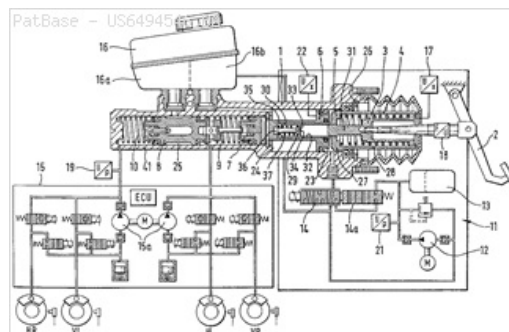
**International (IPC 1-7):** B60T11/00 B60T13/12 B60T13/128

B60T13/66 B60T17/22 B60T7/04 B60T8/34 G01L5/22 G01L5/28

**CPC:** B60T7/042 B60T8/4077 B60T17/222

**European:** B60T17/22B1 B60T7/04B B60T8/40J2

**US:** 188/358 303/113.4 303/114.1



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE19826346 A1      | 19991014         | DE19981026346      | 19980612         |
| DE59900981 D1      | 20020418         | DE19995000981      | 19990407         |
| EP1070006 A1       | 20010124         | EP19990920606      | 19990407         |
| EP1070006 B1       | 20020313         | EP19990920606      | 19990407         |
| JP2002511361 T2    | 20020416         | JP20000543336T     | 19990407         |
| US6494546 BA       | 20021217         | US20000647002      | 20001206         |
| WO9952756 A1       | 19991021         | WO1999EP02351      | 19990407         |

**Priority:**

DE19981016011 19980409 DE19981026346 19980612 DE19995000981 19990407  
WO1999EP02351 19990407

**Probable Assignee:** CONTINENTAL TEVES AND CO OHG AG

**Assignee(s):** (std): CONTINENTAL TEVES AG AND CO OHG ; CONTINENTAL TEVES AND CO OHG AG ; FEIGEL HANS JOERG

**Assignee(s):** CONTINENTAL TEVES AG

**Inventor(s):** (std): FEIGEL HANS JOERG

**Designated states:** AT BE CH CY DE DK ES FI FR GB GR IE IT JP LU MC NL PT SE US

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent        | Date recorded | Event group | Code  | Event                                                                   | Details                                                                      |
|---------------|---------------|-------------|-------|-------------------------------------------------------------------------|------------------------------------------------------------------------------|
| DE19826346 A1 | 19991014      | LSPB        | +     | published / reissued                                                    |                                                                              |
| DE19826346 A1 | 19991014      | LSES        | +OM8  | SEARCH REPORT AVAILABLE AS TO PARAGRAPH 43 LIT. 1 SENTENCE 1 PATENT LAW |                                                                              |
| DE19826346 A1 | 20030424      | LSWD        | -8130 | WITHDRAWAL                                                              |                                                                              |
| DE59900981 D1 | 20030410      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                 |                                                                              |
| EP1070006 A1  | 20010124      | LSPB        | +     | published / reissued                                                    |                                                                              |
| EP1070006 A1  | 20010124      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                                           | EFFECTIVE DATE : 20001109                                                    |
| EP1070006 A1  | 20010627      | LSES        | +17Q  | FIRST EXAMINATION REPORT                                                | EFFECTIVE DATE : 20010517                                                    |
| EP1070006 A1  | 20030305      | LSGT        | +26N  | NO OPPOSITION FILED                                                     | EFFECTIVE DATE : 20021216                                                    |
| EP1070006 A1  | 20050321      | LSFE        | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                          | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20050321<br>YEAR OF FEE PAYMENT : 07 |
| EP1070006 A1  | 20050419      | LSFE        | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                          | REF COUNTRY CODE : FR<br>PAYMENT DATE : 20050419<br>YEAR OF FEE PAYMENT : 07 |
| EP1070006 A1  | 20050430      | LSFE        | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                          | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20050430<br>YEAR OF FEE PAYMENT : 07 |

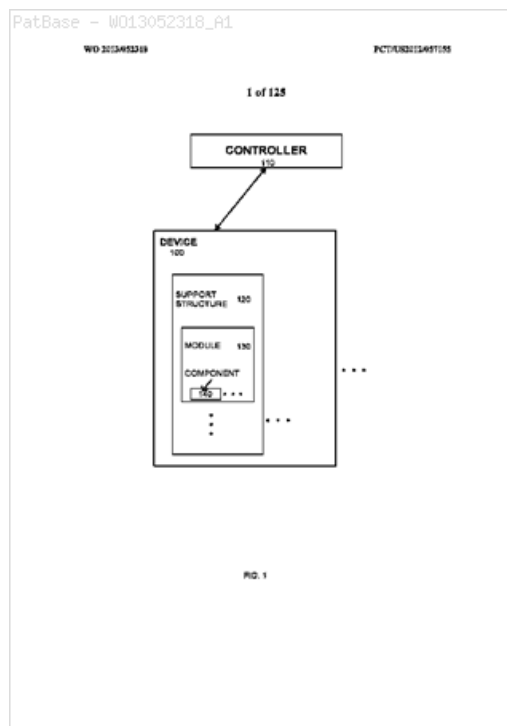
|                 |          |      |       |                                                                                       |                                                                                                                                                                                                    |
|-----------------|----------|------|-------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1070006 A1    | 20050623 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE BECAUSE OF THE APPLICANT RENOUNCES<br>EFFECTIVE DATE : 20050623                                                                                       |
| EP1070006 A1    | 20060407 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20060407                                                                                       |
| EP1070006 A1    | 20061227 | LSLE | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                         | EFFECTIVE DATE : 20060407                                                                                                                                                                          |
| EP1070006 A1    | 20070309 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST<br>EFFECTIVE DATE : 20061230                                                                                                                    |
| EP1070006 A1    | 20080430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : FR<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20060502                                                                                       |
| EP1070006 B1    | 20020313 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                    |
| EP1070006 B1    | 20190407 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                                    |
| JP2002511361 T2 | 20020416 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                                    |
| US6494546 BA    | 20021217 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                    |
| US6494546 BA    | 20001212 | LSAS | AS    | ASSIGNMENT                                                                            | OWNER NAME :<br>CONTINENTAL TEVES AG AND CO. OHG, GERMANY<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:FEIGEL, HANS-JORG;<br>REEL/FRAME:011402/0843<br>EFFECTIVE DATE : 20001120 |
| US6494546 BA    | 20060615 | LSFE | +FPAY | FEE PAYMENT                                                                           | YEAR OF FEE PAYMENT : 4                                                                                                                                                                            |
| US6494546 BA    | 20100601 | LSFE | +FPAY | FEE PAYMENT                                                                           | YEAR OF FEE PAYMENT : 8                                                                                                                                                                            |
| US6494546 BA    | 20141217 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                                             |                                                                                                                                                                                                    |
| US6494546 BA    | 20150112 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362               |                                                                                                                                                                                                    |
| US6494546 BA    | 20150203 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                                         | EFFECTIVE DATE : 20141217                                                                                                                                                                          |
| US6494546 BA    | 20201206 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                                    |
| WO9952756 A1    | 19991021 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                                    |
| WO9952756 A1    | 20001005 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                                           | REF DOCUMENT NUMBER :<br>1999920606<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                |
| WO9952756 A1    | 20001206 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                                           | REF DOCUMENT NUMBER :<br>09647002<br>COUNTRY OF REF DOCUMENT : US                                                                                                                                  |
| WO9952756 A1    | 20010124 | LSPB | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE                                        | REF DOCUMENT NUMBER :<br>1999920606<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                |
| WO9952756 A1    | 20020313 | LSGT | +WWG  | WIPO INFORMATION: GRANT IN NATIONAL OFFICE                                            | REF DOCUMENT NUMBER :<br>1999920606<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                |

**Title:** SYSTEMS AND METHODS FOR MULTI-ANALYSIS

**Abstract:** Systems and methods are provided for sample processing. A device may be provided, capable of receiving the sample, and performing one or more of a sample preparation, sample assay, and detection step. The device may be capable of performing multiple assays. The device may comprise one or more modules that may be capable of performing one or more of a sample preparation, sample assay, and detection step. The device may be capable of performing the steps using a small volume of sample.

**Classifications:**

**International (IPC 8-9):** A61B5/00 A61B6/00 B04B7/00 C12M C12M1/00 C12M1/34 C12Q1/00 G01N1/28 G01N33/50 G01N35/00 G01N35/10 G02B26/00 G02F1/00 (Advanced/Invention); B01L3/00 (Advanced/Non-invention); G01N35/00 (Core/Invention); A61B C12M G01N (Subclass/Invention)  
**CPC:** G01N35/1065 G01N35/00 G01N2035/00326

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU2012318963 AA    | 20130411         | AU20120318963      | 20120925         |
| AU2012318963 BB    | 20160211         | AU20120318963      | 20120925         |
| BR112014007073 A2  | 20170411         | BR20141107073      | 20120925         |
| CA2849104 AA       | 20130411         | CA20122849104      | 20120925         |
| CN103946364 A      | 20140723         | CN201280057640     | 20120925         |
| EP2758510 A1       | 20140730         | EP20120838242      | 20120925         |
| EP2758510 A4       | 20150506         | EP20120838242      | 20120925         |
| HK1200186 A1       | 20150731         | HK20150100659      | 20150121         |
| IL231639 A0        | 20140528         | IL20140231639      | 20140320         |
| JP2014530358 T2    | 20141117         | JP20140532098T     | 20120925         |
| KR20140082756 A    | 20140702         | KR20147011324      | 20120925         |
| MX2014002991 A1    | 20140730         | MX20140002991      | 20120925         |
| MX344792 B         | 20170106         | MX20140002991      | 20120925         |
| NZ622186 A         | 20160226         | NZ20120622186      | 20120925         |
| RU2014109864 A     | 20151027         | RU20140109864      | 20120925         |
| RU2627927 C2       | 20170814         | RU20140109864      | 20120925         |
| SG11201400832S A1  | 20140428         | SG20141100832      | 20120925         |
| WO13052318 A1      | 20130411         | WO2012US57155      | 20120925         |

**Priority:**

US20110244836 20110926 US20110244946 20110926 WO2011US53188 20110925  
WO2011US53189 20110925 US20110244947 20110926 WO2012US57155 20120925

**Probable Assignee:** THERANOS INC**Assignee(s):** (std): BALWANI SUNNY ; FRANKOVICH JOHN KENT ; FRENZEL GARY ; HOLMES ELIZABETH ; THERANOS INC ; ROY JOY ; THERANOS INK**Inventor(s):** (std): BALVONI SANNI ; BALWANI SUNNY ; BALWANI SUNNY S ; ELIZABETH HOLMES ; FRANKOVICH DZHON KENT ; FRANKOVICH JOHN KENT ; FRANKOVICH JOHN KENT JK ; FRENZEL GARY ; FRENZEL GARY G ; FRENZEL GERI ; GARY FRENZEL ; HOLMES ELIZABETH ; HOLMES ELIZABETH E ; JHON KENT ; FRANKOVICH ; JOY ROY ; KHOLMS ELIZABET ; ROJ DZHOJ ; ROY JOY ; ROY JOY J ; SUNNY BALWANI**Agent(s):** SPRUSON AND FERGUSON; GOWLING LAFLEUR HENDERSON LLP; COLE WILLIAM GWYN; KIM ELAINE A ET AL**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW**Legal status (INPADOC)**[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code  | Event                                              | Details                                                              |
|-------------------|---------------|-------------|-------|----------------------------------------------------|----------------------------------------------------------------------|
| AU2012318963 AA   | 20160609      | LSGT        | +FGA  | LETTERS PATENT SEALED OR GRANTED (STANDARD PATENT) |                                                                      |
| AU2012318963 BB   | 20320925      | PEXP        |       | Calculated Patent Term Expiry                      |                                                                      |
| BR112014007073 A2 | 20170411      | LSPB        | +     | published / reissued                               |                                                                      |
| CA2849104 AA      | 20130411      | LSPB        | +     | published / reissued                               |                                                                      |
| CA2849104 AA      | 20170928      | LSES        | +EEER | EXAMINATION REQUEST                                | EFFECTIVE DATE : 20170921                                            |
| CN103946364 A     | 20140723      | LSPB        | +     | published / reissued                               |                                                                      |
| CN103946364 A     | 20140723      | LSPB        | +C06  | PUBLICATION                                        |                                                                      |
| EP2758510 A1      | 20140730      | LSPB        | +     | published / reissued                               |                                                                      |
| EP2758510 A1      | 20140730      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                      | EFFECTIVE DATE : 20140320                                            |
| EP2758510 A1      | 20150211      | LSAS        | RAP1  | TRANSFER OF RIGHTS OF AN EP PUBLISHED APPLICATION  | OWNER NAME : THERANOS, INC.                                          |
| EP2758510 A1      | 20150506      | LSES        | +RA4  | DESPATCH OF SUPPLEMENTARY SEARCH REPORT            | EFFECTIVE DATE : 20150409                                            |
| EP2758510 A1      | 20150506      | LSRE        | RIC1  | CLASSIFICATION (CORRECTION)                        | IPC : G01N 35/00<br>20060101ALI20150401BHEP                          |
| EP2758510 A1      | 20150506      | LSRE        | RIC1  | CLASSIFICATION (CORRECTION)                        | IPC : C12M 1/00<br>20060101AFI20150401BHEP                           |
| EP2758510 A1      | 20150506      | LSRE        | RIC1  | CLASSIFICATION (CORRECTION)                        | IPC : A61B 6/00<br>20060101ALI20150401BHEP                           |
| HK1200186 A1      | 20150731      | LSGT        | +     | granted / extensions (spc, cpc, pte)               |                                                                      |
| HK1200186 A1      | 20350121      | PEXP        |       | Calculated Patent Term Expiry                      |                                                                      |
| JP2014530358 T2   | 20141117      | LSPB        | +     | published / reissued                               |                                                                      |
| JP2014530358 T2   | 20150908      | LSRE        | A521  | WRITTEN AMENDMENT                                  | TEXT : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20150908 |
| JP2014530358 T2   | 20150908      | LSES        | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION        | TEXT : JAPANESE INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20150908 |
| JP2014530358 T2   | 20160719      | LSES        | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                | TEXT : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20160719 |
| JP2014530358 T2   | 20170119      | LSRE        | A521  | WRITTEN AMENDMENT                                  | TEXT : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20170119 |
| JP2014530358 T2   | 20170622      | LSES        | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                | TEXT : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20170622 |
| KR20140082756 A   | 20140702      | LSPB        | +     | published / reissued                               |                                                                      |
| KR20140082756 A   | 20170922      | LSES        | A201  | REQUEST FOR EXAMINATION                            |                                                                      |
| MX2014002991 A1   | 20140730      | LSPB        | +     | published / reissued                               |                                                                      |
| MX2014002991 A1   | 20170106      | LSGT        | +FG   | GRANT OR REGISTRATION                              |                                                                      |
| MX344792 B        | 20170106      | LSGT        | +     | granted / extensions (spc, cpc, pte)               |                                                                      |
| MX344792 B        | 20320925      | PEXP        |       | Calculated Patent Term Expiry                      |                                                                      |
| NZ622186 A        | 20160226      | LSPB        | +     | published / reissued                               |                                                                      |

|                   |          |      |        |                                             |                                                                                                                                                               |
|-------------------|----------|------|--------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NZ622186 A        | 20160527 | LSGT | +PSEA  | PATENT SEALED                               |                                                                                                                                                               |
| NZ622186 A        | 20160729 | LSFE | +RENEW | RENEWAL (RENEWAL FEES ACCEPTED)             | TEXT : PATENT RENEWED FOR 1 YEAR UNTIL 25 SEP 2017 BY SPRUSON + FERGUSON EFFECTIVE DATE : 20160627                                                            |
| NZ622186 A        | 20170825 | LSFE | +RENEW | RENEWAL (RENEWAL FEES ACCEPTED)             | TEXT : PATENT RENEWED FOR 1 YEAR UNTIL 25 SEP 2018 BY DENNEMEYER + CO EFFECTIVE DATE : 20170823                                                               |
| RU2014109864 A    | 20151027 | LSPB | +      | published / reissued                        |                                                                                                                                                               |
| RU2627927 C2      | 20170814 | LSGT | +      | granted / extensions (spc, cpc, pte)        |                                                                                                                                                               |
| RU2627927 C2      | 20320925 | PEXP |        | Calculated Patent Term Expiry               |                                                                                                                                                               |
| SG112014008325 A1 | 20140428 | LSPB | +      | published / reissued                        |                                                                                                                                                               |
| WO13052318 A1     | 20130411 | LSPB | +      | published / reissued                        |                                                                                                                                                               |
| WO13052318 A1     | 20130523 | LSNP | ENP    | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : 2012318963<br>COUNTRY OF REF DOCUMENT : AU<br>DATE OF REF DOCUMENT : 20120925<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) : |
| WO13052318 A1     | 20140318 | LSNP | ENP    | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : 2849104<br>COUNTRY OF REF DOCUMENT : CA                                                                                                 |
| WO13052318 A1     | 20140320 | LSNP | +WWE   | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE | REF DOCUMENT NUMBER : 231639<br>COUNTRY OF REF DOCUMENT : IL                                                                                                  |
| WO13052318 A1     | 20140324 | LSNP | ENP    | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : 2014532098<br>COUNTRY OF REF DOCUMENT : JP<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) :                                    |
| WO13052318 A1     | 20140325 | LSNE | NENP   | NON-ENTRY INTO THE NATIONAL PHASE IN:       | REF COUNTRY CODE : DE                                                                                                                                         |
| WO13052318 A1     | 20140425 | LSNP | ENP    | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : 2014109864<br>COUNTRY OF REF DOCUMENT : RU<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) :                                    |
| WO13052318 A1     | 20140425 | LSNP | ENP    | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : 20147011324<br>COUNTRY OF REF DOCUMENT : KR<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) :                                   |
| WO13052318 A1     | 20170411 | LSNP | ENP    | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : 112014007073<br>COUNTRY OF REF DOCUMENT : BR<br>KIND CODE OF REF DOCUMENT : A2<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20140325    |

**Title:** MOBILE WORKING TOOL WITH A TOOL HEAD

**Abstract:** The invention relates to a mobile working tool with a tool head, e.g. a boring device or manipulator, comprising in order to **control** the movements of its levers and tools, hydraulic motors or cylinder/piston units. The hydraulic motors are **controlled** by proportional **valves** with current **control** effected by a **controllable** current **control** device. Each current **control** device (36) is combined with its logic module (35) to form a modular unit (37), which is placed outside of the computer **housing** in spatial proximity thereto, particularly in the immediate vicinity of the assigned proportional **valve** (30) or is placed thereon. Each modular unit has a power connection (39), which can be connected to a voltage source (40) and which is connected to the logic module (35) of the **control** module. The **control** of the computer can ensue by means of a portable radio device.

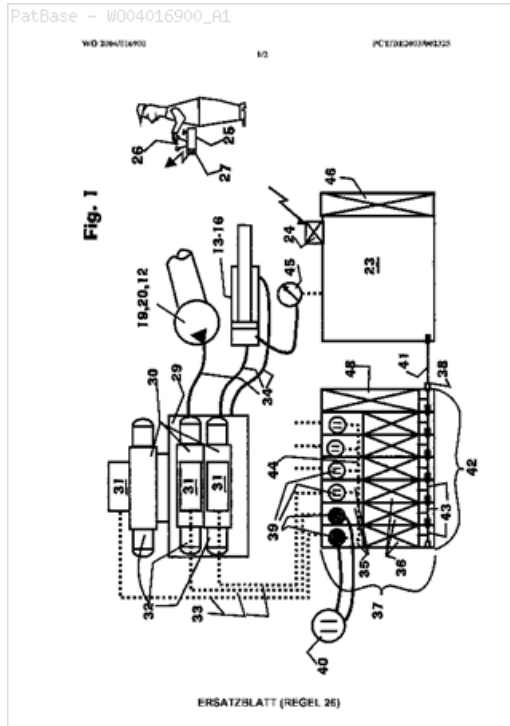
**Classifications:**

**International (IPC 8-9):** E21B7/02 F15B13/08 (Advanced/Invention); E21B7/02 (Core/Invention)

**International (IPC 1-7):** E21B15/04 E21B7/02 F15B13/00 F15B21/08

**CPC:** E21B7/022 E21B7/025 E21C35/24 F15B13/0821 F15B13/0839 F15B13/0853 F15B13/086 F15B13/0867 F15B13/0875 F15B21/08

**European:** E21B7/02C E21B7/02J E21C35/24 F15B13/00B6 F15B13/00B8 F15B13/08B10 F15B13/08B10D F15B13/08B10H F15B13/08B10L F15B13/08B14 F15B13/08B4 F15B13/08B8 F15B13/08B8D F15B21/08



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE10392859 D2      | 20050407         | DE20031092859      | 20030711         |
| WO04016900 A1      | 20040226         | WO2003DE02325      | 20030711         |

**Priority:**

DE20021033716 20020724 DE20031092859 20030711 WO2003DE02325 20030711

**Probable Assignee:** DEILMANN HANIEL MINING SYSTEMS

**Assignee(s):** (std): BROMMONT HARALD ; DEILMANN HANIEL MASCH U ; DEILMANN HANIEL MASCHINEN UND ; DEILMANN HANIEL MINING SYSTEMS ; KUSSEL WILLY ; TIEFENBACH BERGBAUTECHNIK GMBH ; TIEFENBACH CONTROL SYS GMBH

**Assignee(s):** TIEFENBACH CONTROL SYSTEMS GMBH ; DEILMANN HANIEL MINING SYSTEMS GMBH ; DEILMANN HANIEL MASCHINEN UND STAHLBAU GMBH

**Inventor(s):** (std): BROMMONT HARALD ; KUSSEL WILLY

**Designated states:** AT BE BG BY CH CN CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PL PT RO RU SE SI SK TR US ZA

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent        | Date recorded | Event group | Code  | Event                                  | Details |
|---------------|---------------|-------------|-------|----------------------------------------|---------|
| DE10392859 D2 | 20100520      | LSLE        | -8139 | DISPOSAL/NON-PAYMENT OF THE ANNUAL FEE |         |
| WO04016900 A1 | 20040226      | LSPB        | +     | published / reissued                   |         |

**Title:** Improvements in apparatus for determining the concentration of benzole in gas mixtures

**Abstract:** Source: GB818079A 818,079. Photo-electric **control**. BENZOLE PRODUCERS Ltd., and ENGELHARD INDUSTRIES Ltd. April 18, 1957 [April 4, 1956; Feb. 7, 1957], Nos. 12268/56 and 4218/57. Class 40 (3). An apparatus to determine the benzole content of coal or coke oven gas comprises a low-pressure mercury vapour discharge lamp emitting substantially all its light at 2537Å through the heated transparent walls of a chamber containing the test gas on to a vacuum photo-electric cell having a quartz envelope. The walls may be double quartz windows separated by electric resistance elements and silicone rubber rings or they may be heated by passing hot gas between the hollows in the walls. **Valves** 65 and 72, Fig. 2, are connected in a bridge circuit so that differences between the anode currents may be detected by a microammeter 69. In operation, variable resistor 79 is adjusted so that a potential divider comprising resistors 77, 78 and 79 is balanced against resistors 70 and 71. Variable resistor 68 is adjusted until the anode current of **valve** 65 reaches a given value and variable resistor 74 adjusted to balance the anode currents of **valves** 65 and 72. Switch 75, 76 is then operated to connect the **control** grid of **valve** 72 to the cathode of photo-electric cell 12 and the difference between the anode currents of the **valves** is displayed at the meter 69. The primary winding of transformer 50 is supplied with a constant voltage through transformer 52, as is the primary winding of transformer 82, the secondary winding of which supplies lamp 11. The wall heaters 16 are supplied from a low voltage source 83. An alternative measuring circuit is shown in Fig. 3, wherein the tetrode 116 **controls** the current flowing through the lamp 11 by having its screen grid maintained at a stabilized potential by gas-filled voltage stabilizers 119, 120. The signal from photo-electric cell 12 is applied to the **control** grid of pentode 124 (which is connected to pentode 125 to form a differential amplifier) and potentiometers 118, 134 and 135 adjusted so that with maximum light falling on the cell the microammeter 138 is not deflected. The heaters 16 are connected to the low voltage secondary winding 105 of transformer 101 which includes a pilot light 107. The higher voltage secondary winding 106 is connected to a voltage-doubler rectifier circuit 108. To ensure starting of the lamp 11 one electrode is connected through capacitor 147 to one side of the winding 106.

**Classifications:**

**International (IPC 8-9):** G01N21/27 G01N21/33

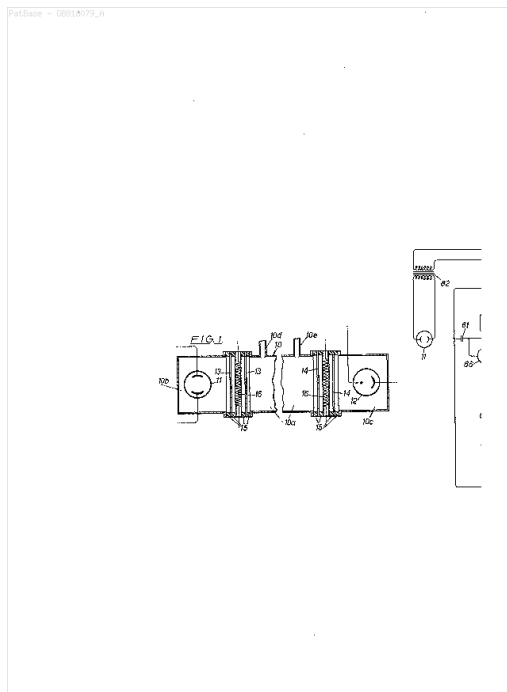
G05F1/52 (Advanced/Invention);

G01N21/25 G01N21/31 G05F1/10 (Core/Invention)

**International (IPC 1-7):** A61N5/06 G01N21/33 H05B41/28

**CPC:** G01N21/27 G01N21/33 G05F1/52

**European:** A61N5/00B G01N21/27 G01N21/33 G05F1/52



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| GB818079 A         | 19590812         | GB19560012268      | 19560421         |
| GB882439 A         | 19611115         | GB19570011930      | 19570207         |

**Priority:**

GB19570011930 19570207

**Probable Assignee:** BENZOLE PRODUCERS LTD

**Assignee(s):** (std): BENZOLE PRODUCERS LTD ; ENGELHARD DEV COMPANY OF CANAD ; ENGELHARD IND LTD

**Assignee(s):** ENGELHARD INDUSTRIES LIMITED ; BENZOLE PRODUCERS LIMITED ; ENGELHARD DEVELOPMENT COMPANY OF CANADA LIMITED ; ENGELHARD DEV CO OF CANAD

**Inventor(s):** (std): CARTER FRANK ; SCOTT RAYMOND PETER WILLIAM

**Legal status (INPADOC)**

View legal status timeline

| Patent     | Date recorded | Event group | Code | Event                                | Details |
|------------|---------------|-------------|------|--------------------------------------|---------|
| GB818079 A | 19590812      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| GB818079 A | 19760421      | PEXP        |      | Calculated Patent Term Expiry        |         |
| GB882439 A | 19611115      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| GB882439 A | 19770207      | PEXP        |      | Calculated Patent Term Expiry        |         |

**Title:** ELEKTRONISCH-MECHANISCH ARBEITENDE UND AUTOMATISCH ELEKTRONISCH-MECHANISCH GESTEUERTE, VIERGLIEDRIGE, UNIVERSALFARBAUFTRAGSVORRICHTUNG. Electro-mechanically operating automatically **electronic-** mechanically **controlled**, four-membered, UNIVERSAL inking device. (Machine translation)

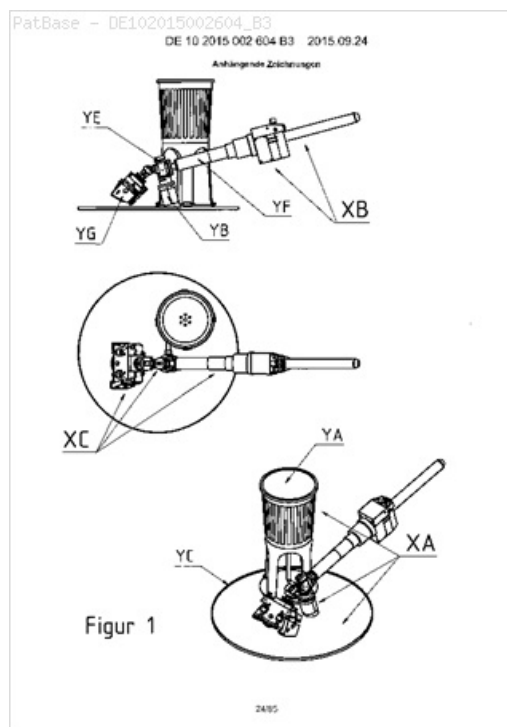
**Abstract:** Source: DE102015002604B3 Elektronisch-mechanisch arbeitende und automatisch elektronisch-mechanisch gesteuerte, viergliedrige, Universalfarbaufragsvorrichtung, hierbei handelt es sich um eine viergliedrige, ueberwiegend automatisch gesteuerte, elektronisch-mechanisch arbeitende Universalfarbaufragsvorrichtung, welche in der Regel mit der gleichen Antriebs- und Steuereinheit (XB) in Verbindung mit zwei austauschbaren Farbaufragsseinheiten wie, z. B., der Peripher-Farbaufragsseinheit (XC) und der Zentrums-Farbaufragsseinheit (XD), den gesamten Farbaufrags auf einer Farbaufragsflaeche bewerkstelligen kann, mit der Universalfarbaufragsvorrichtung wird Farbe in Abhaengigkeit von der Beschaffenheit der Farbaufragsflaeche in einer Farbdicke von 70-80 micro, durch Hinterlassen eines einheitlichen Rollentupfabdruckbildes auf der gesamten Flaeche, gleichmaessig verteilt wird, wobei angrenzende Bauteile nicht mit Farbe beaufschlagt werden. Insbesondere der Farbaufrags gegenueber den, im oberen Bereich rund ausgestaltete Fussleisten (259) oder in die Wand eingelassene Tuerzargen (261 und 262) soll verhindert werden. Mit der hier verwendeten Grossabstands-Einstellvorrichtung (ZF) ist ebenfalls ein kreativer Farbaufrags, wie z. B. einzelne oder mehrere, nach allen Seiten hin scharf abgegrenzte Farbstreifen, auf die Farbaufragsflaeche erreichbar. Electronically-mechanically working and automatically electronically-mechanically **controlled**, four-membered, Universal inking device, this is a four-membered, Mostly automatically **controlled**, electronically-mechanically operating Universal inking unit, which is usually with the same drive and **control** unit (XB) can accomplish in conjunction with two interchangeable inking units as such. B., the peripheral-inking unit (XC) and the center-inking unit (XD), the entire inking a Farbaufragsflaeche, with the Universal inking device is color depending on the nature of Farbaufragsflaeche in a paint thickness of 70-80 micro, by leaving a uniform Rollentupfabdruckbildes on the entire surface, is uniformly distributed, wherein adjacent components are not subjected to color. In particular, the application of paint in relation to the, in the upper area around configured baseboard (259) or embedded in the wall door frames (261 and 262) is to be prevented. With the large clearance adjustment used here (ZF) is also a creative inking such. As single or multiple, on all sides sharply defined color stripes, accessible on the Farbaufragsflaeche.

#### Classifications:

**International (IPC 8-9):** B05C17/005 B05C17/02

B05C17/03 (Advanced/Invention)

**CPC:** B05C17/0212 B05C17/0217 B05C17/0222 B05C17/0245 B05C17/03



#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE102015002604 B3  | 20150924         | DE201510002604     | 20150302         |

#### Priority:

DE201410007972 20140531 DE201510002604 20150302

**Probable Assignee:** MEINHARD WOLFGANG

**Assignee(s):** (std): MEINHARD WOLFGANG

**Inventor(s):** (std): MEINHARD WOLFGANG

#### Legal status (INPADOC)

[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code  | Event                                                    | Details |
|-------------------|---------------|-------------|-------|----------------------------------------------------------|---------|
| DE102015002604 B3 | 20150924      | LSGT        | +     | granted / extensions (spc, cpc, pte)                     |         |
| DE102015002604 B3 | 20150302      | LSES        | +R012 | REQUEST FOR EXAMINATION VALIDLY FILED                    |         |
| DE102015002604 B3 | 20150302      | LSLI        | R086  | NON-BINDING DECLARATION OF LICENSING INTEREST            |         |
| DE102015002604 B3 | 20150716      | LSGT        | +R018 | GRANT DECISION BY EXAMINATION SECTION/EXAMINING DIVISION |         |

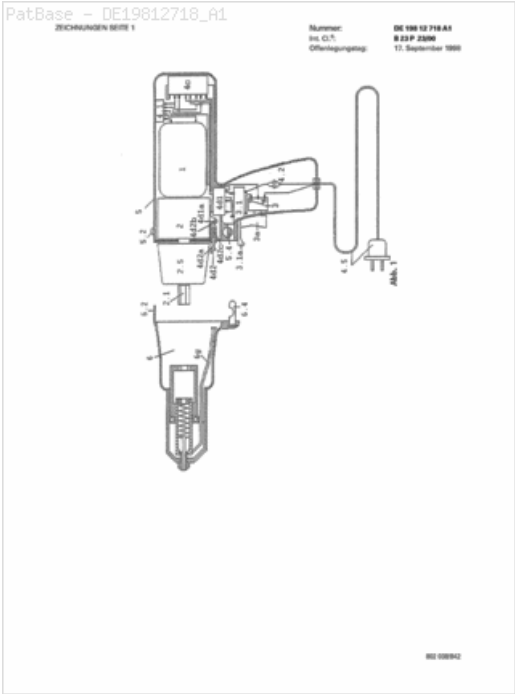
|                   |          |      |       |                               |
|-------------------|----------|------|-------|-------------------------------|
| DE102015002604 B3 | 20160625 | LSGT | +R020 | PATENT GRANT NOW FINAL        |
| DE102015002604 B3 | 20350302 | PEXP |       | Calculated Patent Term Expiry |

**Title:** Multi-electrical drive for multi-boring machine

**Abstract:** Source: DE19812718A1 The multi-electrical drive is for tool devices, namely a multi-boring machine with a built-in automatic position reverser and the accompanying tool devices. The automatic **control** of the position reverser (4) is accomplished by the travelling probe rod through which, according to the operating state of the tool (6), the reverser is switched on or off directly or the position relay is switched on or off through a **control** switch for the position reverser. This way the current direction is reversed. The automatic **control** can also be accomplished by the time-delaying **electronic** circular RC-integration member which is set up beforehand according to the time needed for the processing and **controls** the position relay, thus reversing the current direction. There is another feature for the automatic **control** plus two features for the drive shaft.

**Classifications:**

**International (IPC 8-9):** B21J15/04 B21J15/26 B21J15/28 B25F3/00 (Advanced/Invention); B21J15/00 B25F3/00 (Core/Invention)  
**International (IPC 1-7):** B21J15/26 B23B45/02 B23D29/00 B23P23/00 B25B21/00 B27C3/08 H02K11/00  
**CPC:** B21J15/048 B21J15/26 B21J15/28 B25F3/00  
**European:** B21J15/04D B21J15/26 B21J15/28 B25F3/00



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE19812718 A1      | 19980917         | DE19981012718      | 19980324         |

**Priority:**

DE19981012718 19980324

**Probable Assignee:** LAI XIAO WEI  
**Assignee(s):** (std): LAI XIAO WEI  
**Assignee(s):** LAI XIAO WEI 33619 BIELEFELD DE  
**Inventor(s):** (std): LAI XIAO WEI  
**Inventor(s):** LAI XIAO WEI 33619 BIELEFELD DE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent        | Date recorded | Event group | Code  | Event                                                                                          | Details |
|---------------|---------------|-------------|-------|------------------------------------------------------------------------------------------------|---------|
| DE19812718 A1 | 19980917      | LSPB        | +     | published / reissued                                                                           |         |
| DE19812718 A1 | 19980917      | LSPB        | +OAV  | APPLICANT AGREED TO THE PUBLICATION OF THE UNEXAMINED APPLICATION AS TO PARAGRAPH 31 LIT. 2 Z1 |         |
| DE19812718 A1 | 19981022      | LSLI        | 8122  | NONBINDING INTEREST IN GRANTING LICENCES DECLARED                                              |         |
| DE19812718 A1 | 20030116      | LSLE        | -8139 | DISPOSAL/NON-PAYMENT OF THE ANNUAL FEE                                                         |         |

**Title:** Powered lifter

**Abstract:** Source: US4629391A A powered lifter that enables one person to move loads such as cars, trucks, farm equipment, trailers and the like from one location to another. The device includes a rear frame supported by a pair of wheels that mounts an upstanding telescoping mast having a rotatable load supporting carriage at its upper end and a hydraulic cylinder connected to the mast for raising and lowering the carriage. The device also includes a front frame pivotally connected to the rear frame and supported by a drive wheel which is driven by a hydraulic motor and steered by a steering arm connected to the front frame which also houses the electronic circuitry for the device. A cabinet is mounted on the rear frame for housing the electrical and hydraulic components for the device, and for reinforcing the frame to avoid sagging and lateral shifting of the frame.

**Classifications:**

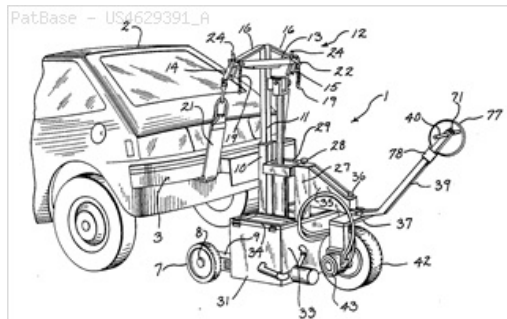
**International (IPC 8-9):** B60P3/12 B66C23/48 (Advanced/Invention); B66C23/00 (Core/Invention)

**International (IPC 1-7):** B60P3/12

**CPC:** B66C23/48

**European:** B66C23/48

**US:** 180/19.1 180/306 254/84 414/563 D34/28



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CA1264308 A1       | 19900109         | CA19850492658      | 19851009         |
| US4629391 A        | 19861216         | US19840658526      | 19841009         |

**Priority:**

CA19850492658 19851009 US19840658526 19841009

**Probable Assignee:** DELAWARE CAPITAL FORMATION INC

**Assignee(s):** (std): MITCHELL DEAN E ; SOYK MELVIN A ; CHIEF AUTOMOTIVE SYSTEMS INC

**Assignee(s):** DELAWARE CAPITAL FORMATION INC ; MOBILE POWER INC ; NU STAR INC ; MOBILE POWER INC A CORP OF WISCONSIN

**Inventor(s):** (std): MITCHELL DEAN E ; SOYK MELVIN A

**Agent(s):** OYEN WIGGS GREEN AND MUTALA LLP

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                | Details                                                                                                                                                                                                                    |
|--------------|---------------|-------------|-------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CA1264308 A1 | 20070109      | LSLE        | -MKEX | EXPIRY                               |                                                                                                                                                                                                                            |
| US4629391 A  | 19861216      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                            |
| US4629391 A  | 19861015      | LSGT        | PAT1  | Patented Case                        |                                                                                                                                                                                                                            |
| US4629391 A  | 19870626      | LSAS        | AS    | ASSIGNMENT                           | OWNER NAME : MOBILE POWER INC., HARTFORD, WISCONSIN A CORP. OF<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:MITCHELL, DEAN, E.,; SOYK, MELVIN, A.,; REEL/FRAME:004729/0286<br>EFFECTIVE DATE : 19851030 |
| US4629391 A  | 19870626      | LSAS        | AS    | ASSIGNMENT                           | OWNER NAME : MOBILE POWER INC., A CORP. OF WISCONSIN,WISCONSIN<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:MITCHELL, DEAN, E.,; SOYK, MELVIN, A.,; REEL/FRAME:004729/0286<br>EFFECTIVE DATE : 19851030 |
| US4629391 A  | 19870908      | LSAS        | AS    | ASSIGNMENT                           | OWNER NAME : CHIEF AUTOMOTIVE SYSTEMS, INC.,NEBRASKA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:MOBILE POWER INC. A CORP. OF WI;<br>REEL/FRAME:004760/0570<br>EFFECTIVE DATE : 19870715                   |
| US4629391 A  | 19870908      | LSAS        | AS    | ASSIGNMENT                           | OWNER NAME : MOBILE POWER, INC.,<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:MITCHELL, DEAN E.; SOYK, MELVIN A.; REEL/FRAME:004760/0587<br>EFFECTIVE DATE : 19870715                                   |

|             |          |      |       |             |                                                                                                                                                                                                                      |
|-------------|----------|------|-------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US4629391 A | 19870908 | LSAS | AS    | ASSIGNMENT  | OWNER NAME : CHIEF AUTOMOTIVE SYSTEMS, INC., 1924 EAST 4TH ST.,<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNOR:MOBILE POWER INC. A CORP. OF WI;<br>REEL/FRAME:004760/0570<br>EFFECTIVE DATE : 19870715 |
| US4629391 A | 19900618 | LSFE | +FPAY | FEE PAYMENT | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                              |
| US4629391 A | 19940523 | LSFE | +FPAY | FEE PAYMENT | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                              |
| US4629391 A | 19941222 | LSAS | AS    | ASSIGNMENT  | OWNER NAME : NU-STAR, INC., MINNESOTA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:CHIEF AUTOMOTIVE SYSTEMS, INC.;<br>REEL/FRAME:007251/0432<br>EFFECTIVE DATE : 19941209                             |
| US4629391 A | 19970123 | LSAS | AS    | ASSIGNMENT  | OWNER NAME : NU-STAR INC., MINNESOTA<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:CHIEF AUTOMOTIVE SYSTEMS, INC.;<br>REEL/FRAME:008354/0483<br>EFFECTIVE DATE : 19970113                              |
| US4629391 A | 19981005 | LSFE | +FPAY | FEE PAYMENT | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                             |
| US4629391 A | 20020213 | LSAS | AS    | ASSIGNMENT  | OWNER NAME : DELAWARE CAPITAL FORMATION, INC., DELAWARE<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:CHIEF AUTOMOTIVE SYSTEMS, INC.;<br>REEL/FRAME:012621/0271<br>EFFECTIVE DATE : 20011228           |

**Title:** DOOR-OPERATING **VALVE**.

**Abstract:** In a known door-operating **valve** for a pneumatically actuated door system having two integrated 3/2 way **valves controlled** by means of solenoid pre-**control valves**, it is known, in the case of an emergency shut-off of the door drive, to actuate both 3/2 way **valve** via an upstream AND element in such a way that the door drive is pressure- relieved in both directions of movement. The AND element is susceptible to faults and in addition complicated and costly. In order to replace the AND element, the invention proposes the arrangement of a double **valve** which can be **controlled** in any desired way.

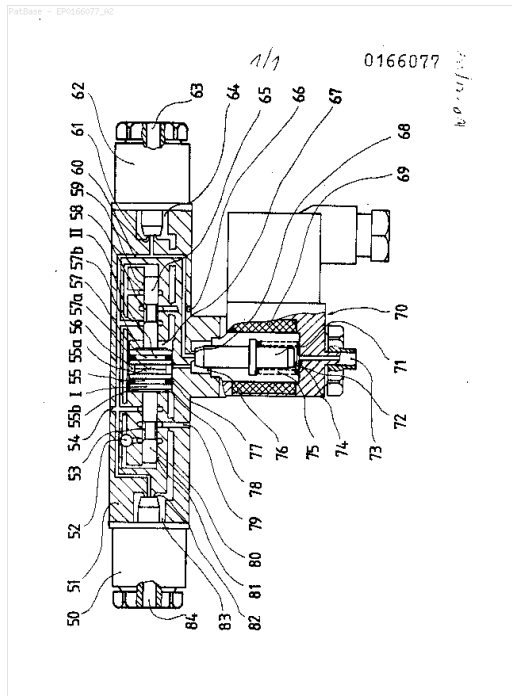
**Classifications:**

**International (IPC 8-9):** E05F15/00 E05F15/02 (Advanced/Invention); E05F15/00 (Core/Invention)

**International (IPC 1-7):** B60J5/00 E05F15/02

**CPC:** E05F15/50 E05F15/49 E05Y2900/132

**European:** E05F15/00B10 E05F15/02 P05Y900/132



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE3420632 A1       | 19851205         | DE19843420632      | 19840602         |
| EP0166077 A2       | 19860102         | EP19850102124      | 19850227         |
| EP0166077 A3       | 19860716         | EP19850102124      | 19850227         |
| ES542280 A0        | 19860516         | ES19850542280      | 19850416         |
| ES8607469 A1       | 19860516         | ES19850542280      | 19850416         |
| HU193968 B         | 19871228         | HU19850001413      | 19850416         |
| HU40826 A2         | 19870227         | HU19850001413      | 19850416         |

**Priority:**

DE19843420632 19840602

**Probable Assignee:** WABCO WESTINGHOUSE FAHRZEUG

**Assignee(s):** (std): WABCO WESTINGHOUSE FAHRZEUG

**Assignee(s):** WABCO WESTINGHOUSE FAHRZEUGBREMSSEN GMBH ; WABCO WESTINGHOUSE FAHRZEUGBREMSSEN GMBH DE

**Inventor(s):** (std): SEBESTA GUNTER ; SEBESTA GUENTER ; GUDAT WOLFGANG

**Inventor(s):** GUDAT WOLFGANG DE ; SEBESTA GUENTER DE

**Designated states:** DE FR GB IT SE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                                                   | Details                   |
|--------------|---------------|-------------|-------|-------------------------------------------------------------------------|---------------------------|
| DE3420632 A1 | 19851205      | LSPB        | +     | published / reissued                                                    |                           |
| DE3420632 A1 | 19851205      | LSES        | +OM8  | SEARCH REPORT AVAILABLE AS TO PARAGRAPH 43 LIT. 1 SENTENCE 1 PATENT LAW |                           |
| DE3420632 A1 | 19890608      | LSLE        | -8139 | DISPOSAL/NON-PAYMENT OF THE ANNUAL FEE                                  |                           |
| EP0166077 A2 | 19860102      | LSPB        | +     | published / reissued                                                    |                           |
| EP0166077 A2 | 19860827      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                                           | EFFECTIVE DATE : 19860626 |
| EP0166077 A2 | 19871202      | LSES        | +17Q  | FIRST EXAMINATION REPORT                                                | EFFECTIVE DATE : 19871020 |

|              |          |      |      |                                      |                                 |
|--------------|----------|------|------|--------------------------------------|---------------------------------|
| EP0166077 A2 | 19880921 | LSRV | -18R | REFUSED                              | EFFECTIVE<br>DATE :<br>19880707 |
| ES8607469 A1 | 19860516 | LSGT | +    | granted / extensions (spc, cpc, pte) |                                 |
| ES8607469 A1 | 20060516 | PEXP |      | Calculated Patent Term Expiry        |                                 |
| HU193968 B   | 19871228 | LSGT | +    | granted / extensions (spc, cpc, pte) |                                 |
| HU193968 B   | 20050416 | PEXP |      | Calculated Patent Term Expiry        |                                 |
| HU40826 A2   | 19870227 | LSPB | +    | published / reissued                 |                                 |

**Title:** EMERGENCY CLUTCH ARRANGEMENT

**Abstract:** The clutch of the utility vehicle is normally operated by hydropneumatic mechanism and **controlled** by an **electronic control** system. If the automatic clutch fails then the driver operates a standby clutch pedal (48) which drives a standby hydraulic cylinder (49) to operate the clutch. The operation of the cylinder is monitored by displacement sensors which activate a servo pressure to assist the clutch change. The driver operates the clutch pedal as for a non-automatic transmission. The clutch pedal allows a fine degree of clutch **control** with a simple construction. The operation of the standby clutch is also related to the vehicle speed.

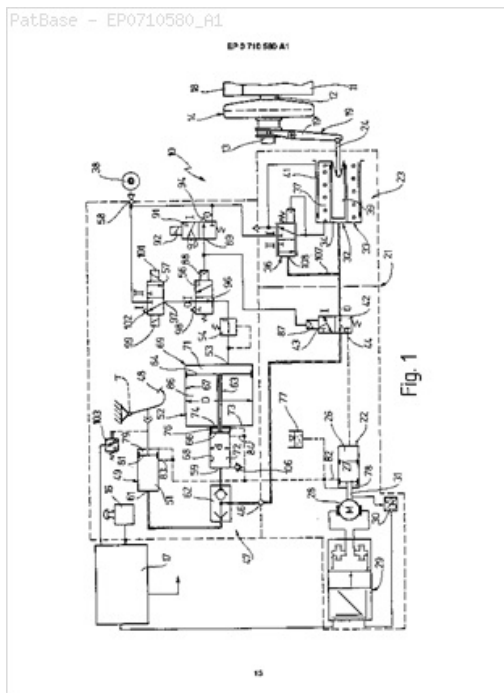
**Classifications:**

**International (IPC 8-9):** B60K23/02 F16D48/02 (Advanced/Invention);  
B60K23/00 F16D48/00 (Core/Invention)

**International (IPC 1-7):** B60K23/02 F16D48/02

**CPC:** B60K23/02

**European:** B60K23/02



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE4439447 C1       | 19960314         | DE19944439447      | 19941104         |
| DE59502583 D1      | 19980723         | DE19955002583      | 19950914         |
| EP0710580 A1       | 19960508         | EP19950114437      | 19950914         |
| EP0710580 B1       | 19980617         | EP19950114437      | 19950914         |

**Priority:**

DE19944439447 19941104 DE19955002583 19950914

**Probable Assignee:** DAIMLER BENZ AG

**Assignee(s):** (std): DAIMLER BENZ AG

**Assignee(s):** DAIMLER BENZ AKTIENGESELLSCHAFT ; DAIMLER BENZ AKTIENGESELLSCHAFT 70567 STUTTGART DE ; MERCEDES BENZ AG ; MERCEDES BENZ AKTIENGESELLSCHAFT 70327 STUTTGART D ; MERCEDES BENZ AKTIENGESELLSCHAFT 70327 STUTTGART DE

**Inventor(s):** (std): PAULSEN LUTZ DR ING ; MUELLER ALFONS DIPL ING

**Inventor(s):** MUELLER ALFONS DIPL ING D 70378 STUTTGART DE ; MUELLER ALFONS DIPL ING 70378 STUTTGART DE ; PAULSEN LUTZ DR ING 73733 ESSLINGEN DE ; PAULSEN LUTZ DR ING D 73733 ESSLINGEN DE

**Designated states:** DE FR IT SE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                                                                 | Details                                                        |
|--------------|---------------|-------------|-------|---------------------------------------------------------------------------------------|----------------------------------------------------------------|
| DE4439447 C1 | 19960314      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                |
| DE4439447 C1 | 19960314      | LSPB        | +8100 | PUBLICATION OF THE EXAMINED APPLICATION WITHOUT PUBLICATION OF UNEXAMINED APPLICATION |                                                                |
| DE4439447 C1 | 19960314      | LSGT        | +D1   | GRANT (NO UNEXAMINED APPLICATION PUBLISHED) PATENT LAW 81                             |                                                                |
| DE4439447 C1 | 19960912      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                               |                                                                |
| DE4439447 C1 | 19971002      | LSAS        | 8327  | CHANGE IN THE PERSON/NAME/ADDRESS OF THE PATENT OWNER                                 | OWNER NAME : DAIMLER-BENZ AKTIENGESELLSCHAFT, 70567 STUTTGART, |
| DE4439447 C1 | 19990527      | LSAS        | 8327  | CHANGE IN THE                                                                         | OWNER NAME :                                                   |

|               |          |       |       |                                                                                                |                                                                                                                           |
|---------------|----------|-------|-------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
|               |          |       |       | PERSON/NAME/ADDRESS OF THE<br>PATENT OWNER                                                     | DAIMLERCHRYSLER<br>AG, 70567<br>STUTTGART, DE                                                                             |
| DE4439447 C1  | 20021107 | LSLE  | -8339 | CEASED/NON-PAYMENT OF THE<br>ANNUAL FEE                                                        |                                                                                                                           |
| DE4439447 C1  | 20141104 | PEXP  |       | Calculated Patent Term Expiry                                                                  |                                                                                                                           |
| DE59502583 D1 | 19990408 | LSAS  | 8327  | CHANGE IN THE<br>PERSON/NAME/ADDRESS OF THE<br>PATENT OWNER                                    | OWNER NAME :<br>DAIMLERCHRYSLER<br>AG, 70567<br>STUTTGART, DE                                                             |
| DE59502583 D1 | 19990715 | LSGT  | +8364 | NO OPPOSITION DURING TERM<br>OF OPPOSITION                                                     |                                                                                                                           |
| DE59502583 D1 | 20060713 | LSLE  | -8339 | CEASED/NON-PAYMENT OF THE<br>ANNUAL FEE                                                        |                                                                                                                           |
| EP0710580 A1  | 19960508 | LSPB  | +     | published / reissued                                                                           |                                                                                                                           |
| EP0710580 A1  | 19960529 | LSSES | +17P  | REQUEST FOR EXAMINATION<br>FILED                                                               | EFFECTIVE DATE :<br>19960329                                                                                              |
| EP0710580 A1  | 19970305 | LSSES | +17Q  | FIRST EXAMINATION REPORT                                                                       | EFFECTIVE DATE :<br>19970120                                                                                              |
| EP0710580 A1  | 19970910 | LSAS  | RAP1  | TRANSFER OF RIGHTS OF AN EP<br>PUBLISHED APPLICATION                                           | OWNER NAME :<br>DAIMLER-BENZ<br>AKTIENGESELLSCHAFT                                                                        |
| EP0710580 A1  | 19990407 | LSAS  | RAP2  | TRANSFER OF RIGHTS OF AN EP<br>GRANTED PATENT                                                  | OWNER NAME :<br>DAIMLERCHRYSLER AG                                                                                        |
| EP0710580 A1  | 19990609 | LSGT  | +26N  | NO OPPOSITION FILED                                                                            |                                                                                                                           |
| EP0710580 A1  | 20000825 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID<br>TO NATIONAL OFFICE                                              | REF COUNTRY CODE :<br>SE<br>PAYMENT DATE :<br>20000825<br>YEAR OF FEE PAYMENT<br>: 06                                     |
| EP0710580 A1  | 20000831 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID<br>TO NATIONAL OFFICE                                              | REF COUNTRY CODE :<br>FR<br>PAYMENT DATE :<br>20000831<br>YEAR OF FEE PAYMENT<br>: 06                                     |
| EP0710580 A1  | 20010915 | LSLE  | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE :<br>SE<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-<br>PAYMENT OF DUE FEES<br>EFFECTIVE DATE :<br>20010915 |
| EP0710580 A1  | 20020507 | LSLE  | -EUG  | SE: EUROPEAN PATENT HAS<br>LAPSED                                                              | REF DOCUMENT<br>NUMBER : 95114437.7<br>FORMAT OF REF<br>DOCUMENT (F/P) : F                                                |
| EP0710580 A1  | 20020531 | LSLE  | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE :<br>FR<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-<br>PAYMENT OF DUE FEES<br>EFFECTIVE DATE :<br>20020531 |
| EP0710580 A1  | 20020705 | LSLE  | REG   | REFERENCE TO A NATIONAL<br>CODE                                                                | REF COUNTRY CODE :<br>FR<br>REF LEGAL EVENT<br>CODE : ST                                                                  |
| EP0710580 A1  | 20040907 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID<br>TO NATIONAL OFFICE                                              | REF COUNTRY CODE :<br>DE<br>PAYMENT DATE :<br>20040907<br>YEAR OF FEE PAYMENT<br>: 10                                     |
| EP0710580 A1  | 20050914 | LSLE  | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM<br>NAT. OFFICE TO EPO | REF COUNTRY CODE :<br>IT<br>DESCRIPTION : LAPSE<br>BECAUSE OF NON-<br>PAYMENT OF DUE FEES<br>EFFECTIVE DATE :<br>20050914 |
| EP0710580 A1  | 20060401 | LSLE  | -PG25 | LAPSED IN A CONTRACTING<br>STATE ANNOUNCED VIA<br>POSTGRANT INFORM. FROM                       | REF COUNTRY CODE :<br>DE<br>DESCRIPTION : LAPSE                                                                           |

|              |          |      |                               |                                      |                                                                    |
|--------------|----------|------|-------------------------------|--------------------------------------|--------------------------------------------------------------------|
|              |          |      |                               | NAT. OFFICE TO EPO                   | BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE :<br>20060401 |
| EP0710580 B1 | 19980617 | LSGT | +                             | granted / extensions (spc, cpc, pte) |                                                                    |
| EP0710580 B1 | 20150914 | PEXP | Calculated Patent Term Expiry |                                      |                                                                    |

**Title:** DRUCKLUFT-WARTUNGSGERAET UND DAMIT AUSGESTATTETE VERBRAUCHERSTEUERVORRICHTUNG COMPRESSED AIR MAINTENANCE UNIT, AND CONSUMER **CONTROL** DEVICE EQUIPPED WITH THE SAME

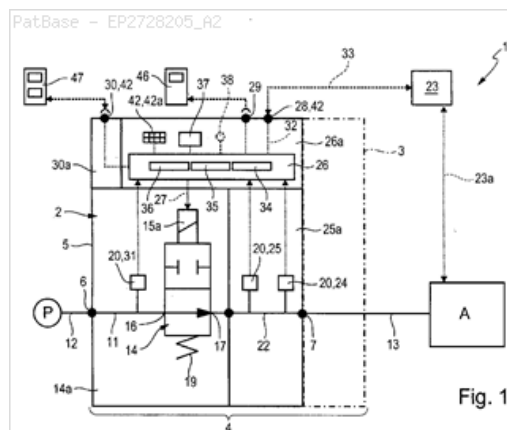
**Abstract:** Source: EP2728205A3 Es werden ein Druckluft-Wartungsgeraet (2) und eine damit ausgestattete Verbrauchersteuervorrichtung (1) vorgeschlagen, wobei das Druckluft-Wartungsgeraet (2) ueber ein Schaltventil (14) in Form eines 2/2-Wegeventils verfuegt, das in die Offenstellung vorgespannt ist. An einen ausgangsseitig an das Schaltventil (14) angeschlossenen Auslasskanal (22) ist ein Durchflusssensor (25) angeschlossen, der mit einer internen elektronischen Steuereinheit (26) kommuniziert, die das Schaltventil (14) unter Beruecksichtigung der vom Durchflusssensor (25) erhaltenen Messwerte betaeetigen kann. Liegt an dem Schaltventil (14) kein elektrisches Umschaltsignal an, nimmt es eine die Druckluftversorgung einer angeschlossenen Verbrauchereinrichtung (A) gewaehrleistende Offenstellung ein. Auf diese Weise wird die Druckluftversorgung der externen Verbrauchereinrichtung (A) von einem Entfall der Stromversorgung nicht beeintraechtigt. [EP2728205\_A3\_a00001.tif]

**Classifications:**

**International (IPC 8-9):** F15B19/00 F15B21/04

F15B21/14 (Advanced/Invention)

**CPC:** F15B21/048 F15B2211/3138 F15B2211/31529 F15B2211/6309 F15B2211/6323 F15B2211/857 F15B2211/8855



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE102012021533 A1  | 20140430         | DE201210021533     | 20121031         |
| EP2728205 A2       | 20140507         | EP20130003650      | 20130720         |
| EP2728205 A3       | 20171206         | EP20130003650      | 20130720         |

**Priority:**

DE201210021533 20121031

**Probable Assignee:** FESTO AND CO AG KG

**Assignee(s):** (std): FESTO AND CO AG KG

**Inventor(s):** (std): GARNER JENS ; MAYER ANDREAS ; MEYER ANDREAS

**Agent(s):** ABEL MARTIN; PATENTANWALTE MAGENBAUER AND KOLLEGEN PARTNERSCHAFT MBB

**Designated states:** AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code  | Event                                 | Details                   |
|-------------------|---------------|-------------|-------|---------------------------------------|---------------------------|
| DE102012021533 A1 | 20140430      | LSPB        | +     | published / reissued                  |                           |
| DE102012021533 A1 | 20121031      | LSES        | +R012 | REQUEST FOR EXAMINATION VALIDLY FILED |                           |
| EP2728205 A2      | 20140507      | LSPB        | +     | published / reissued                  |                           |
| EP2728205 A2      | 20140507      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED         | EFFECTIVE DATE : 20130720 |

**Title:** METHOD OF ASSOCIATING A WATER UTILITY SERVICE LINE TO A CUSTOMER SERVICE LINE

**Abstract:** Source: US2008149180A The invention relates to a meter box for **housing** a utility meter and configured for associating a customer service line to a utility service line. The meter box may be configured to fit within an existing meter box and may be configured with side sections in a telescopic arrangement. Flow **control** components at an input of the meter box prevent backflow. The meter box comprises an **electronic** module that includes a variety of selectable features including data logging, AMR, environmental monitoring, and resource monitoring. A remote monitor is provided for allowing a customer to view selected data including consumption data, pressure, pH, temperature, warnings, remote turnoff, and provide secured bill paying services. Imaging/audio components provide visual and audio data which may include an image of an analog readout for a meter register, images of the metering environment, and sound data for metering environment.

**Classifications:**

**International (IPC 8-9):** F16K15/03 G05D7/00

G06F15/16 (Advanced/Invention);

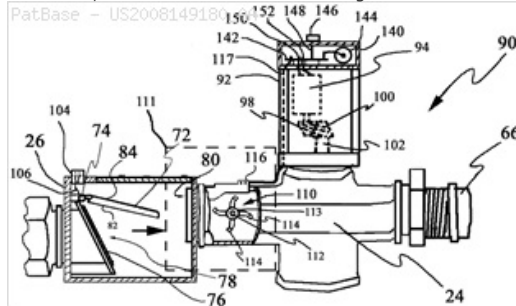
F16K15/02 G05D7/00 G06F15/16 (Core/Invention)

**CPC:** F16K27/12 E03B7/072 E03B7/095 E03B9/08 E03C1/104

Y10T137/0318

**European:** E03B7/07C E03B7/09A E03B9/08 E03C1/10 E03C1/10B F16K27/12

**US:** 137/1 137/1P 700/282 700/282S 709/201 709/201S



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2008149180 AA    | 20080626         | US20060614684      | 20061221         |

**Priority:**

US20060614684 20061221

**Probable Assignee:**

KAY JOHN MICHAEL

**Assignee(s):** (std):

KAY JOHN MICHAEL ; PARRIS EARL H

**Inventor(s):** (std):

KAY JOHN MICHAEL ; PARRIS EARL H

**Agent(s):**

SIMMONS PATENTS

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code  | Event                                               | Details |
|-----------------|---------------|-------------|-------|-----------------------------------------------------|---------|
| US2008149180 AA | 20080626      | LSPB        | +     | published / reissued                                |         |
| US2008149180 AA | 20110606      | LSWD        | -ABD3 | Abandoned -- Failure to Respond to an Office Action |         |

**Title:** EXHAUST GAS PURIFICATION SYSTEM

**Abstract:** Source: US2013259755A The present invention relates to a technology of reducing nitrogen oxide (NOx) which is harmful discharge gas discharged from an internal combustion engine or a combustor, and to an exhaust gas purification system which inputs solid ammonium salt such as ammonium carbamate or ammonium carbonate into a reactor, thermally decomposes and converts the solid ammonium salt into the ammonia by using engine cooling water, exhaust gas, or an electric heater, which are installed in the reactor, and reduces the nitrogen oxide included in the exhaust pipe on a selective catalytic reduction into nitrogen by injecting the ammonia by using a pressure regulator and a dosing valve.

**Classifications:**

**International (IPC 8-9):** B01D50/00 B01D53/90 B01D53/92

B01D53/94 F01N3/10 F01N3/20 F01N3/24

F01N3/28 (Advanced/Invention)

**CPC:** B01D53/92 B01D53/9431 B01D53/90 B01D2259/128

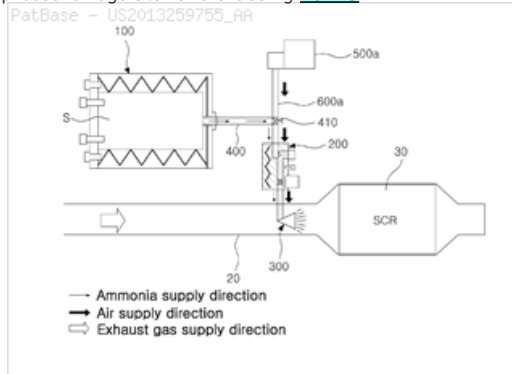
F01N3/2066 F01N3/208 F01N2610/08 F01N2610/10 F01N2610/11

F01N2610/12 F01N2610/14 F01N2610/148 Y02T10/24 F01N3/10

B01D53/94 F01N3/28 F01N2570/14 F01N2610/02 B01D2251/2062

F01N2610/085 B01D2251/2067 F24H9/1872

**US:** 1/1 422/111 422/119 422/148

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| KR101185413 B1     | 20120924         | KR20120034670      | 20120403         |
| KR101476757 B1     | 20141226         | KR20120145178      | 20121213         |
| KR20140076768 A    | 20140623         | KR20120145178      | 20121213         |
| KR20140076769 A    | 20140623         | KR20120145181      | 20121213         |
| US2013259755 AA    | 20131003         | US20130855113      | 20130402         |
| US9381466 BB       | 20160705         | US20130855113      | 20130402         |

**Priority:**

KR20120034670 20120403 KR20120145178 20121213 KR20120145181 20121213

**Probable Assignee:** KOREA MACH AND MATERIALS INST

**Assignee(s):** (std): KOREA MACH AND MATERIALS INST

**Assignee(s):** KOREA INST OF MACHINERY AND MATERIALS ; KOREA INSTITUTE OF MACHINERY AND MATERIALS

**Inventor(s):** (std): CHO GYU BAEK ; KIM HONG SUK ; LEE JUN HO ; LEE SEOK HWAN ; LEE YONG GYU ; WOO SE JONG

**Agent(s):** LEX IP MEISTER PLLC

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent         | Date recorded | Event group | Code  | Event                                             | Details                                            |
|----------------|---------------|-------------|-------|---------------------------------------------------|----------------------------------------------------|
| KR101185413 B1 | 20120924      | LSGT        | +     | granted / extensions (spc, cpc, pte)              |                                                    |
| KR101185413 B1 | 20120403      | LSSES       | A201  | REQUEST FOR EXAMINATION                           |                                                    |
| KR101185413 B1 | 20120420      | LSSES       | A302  | REQUEST FOR ACCELERATED EXAMINATION               |                                                    |
| KR101185413 B1 | 20120601      | LSSES       | -E902 | NOTIFICATION OF REASON FOR REFUSAL                |                                                    |
| KR101185413 B1 | 20120823      | LSGT        | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT |                                                    |
| KR101185413 B1 | 20120918      | LSGT        | +GRNT | WRITTEN DECISION TO GRANT                         |                                                    |
| KR101185413 B1 | 20150609      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20150609<br>YEAR OF FEE PAYMENT : 4 |
| KR101185413 B1 | 20160613      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20160613<br>YEAR OF FEE PAYMENT : 5 |
| KR101185413 B1 | 20170621      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20170621<br>YEAR OF FEE PAYMENT : 6 |
| KR101185413 B1 | 20320403      | PEXP        |       | Calculated Patent Term Expiry                     |                                                    |

|                 |          |      |       |                                          |                                                                                                                                                                                                                                              |
|-----------------|----------|------|-------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KR101476757 B1  | 20141226 | LSGT | +     | granted / extensions (spc, cpc, pte)     |                                                                                                                                                                                                                                              |
| KR101476757 B1  | 20121213 | LSES | A201  | REQUEST FOR EXAMINATION                  |                                                                                                                                                                                                                                              |
| KR101476757 B1  | 20140113 | LSES | -E902 | NOTIFICATION OF REASON FOR REFUSAL       |                                                                                                                                                                                                                                              |
| KR101476757 B1  | 20140613 | LSRE | AMND  | AMENDMENT                                |                                                                                                                                                                                                                                              |
| KR101476757 B1  | 20140901 | LSRV | -E601 | DECISION TO REFUSE APPLICATION           |                                                                                                                                                                                                                                              |
| KR101476757 B1  | 20140930 | LSRE | AMND  | AMENDMENT                                |                                                                                                                                                                                                                                              |
| KR101476757 B1  | 20141106 | LSGT | +X701 | DECISION TO GRANT (AFTER RE-EXAMINATION) |                                                                                                                                                                                                                                              |
| KR101476757 B1  | 20141219 | LSGT | +GRNT | WRITTEN DECISION TO GRANT                |                                                                                                                                                                                                                                              |
| KR101476757 B1  | 20170907 | LSFE | FPAY  | ANNUAL FEE PAYMENT                       | PAYMENT DATE : 20170907<br>YEAR OF FEE PAYMENT : 4                                                                                                                                                                                           |
| KR101476757 B1  | 20321213 | PEXP |       | Calculated Patent Term Expiry            |                                                                                                                                                                                                                                              |
| KR20140076768 A | 20140623 | LSPB | +     | published / reissued                     |                                                                                                                                                                                                                                              |
| KR20140076769 A | 20140623 | LSPB | +     | published / reissued                     |                                                                                                                                                                                                                                              |
| KR20140076769 A | 20121213 | LSES | A201  | REQUEST FOR EXAMINATION                  |                                                                                                                                                                                                                                              |
| KR20140076769 A | 20140114 | LSES | -E902 | NOTIFICATION OF REASON FOR REFUSAL       |                                                                                                                                                                                                                                              |
| KR20140076769 A | 20140627 | LSRV | -E601 | DECISION TO REFUSE APPLICATION           |                                                                                                                                                                                                                                              |
| KR20140076769 A | 20140825 | LSRE | AMND  | AMENDMENT                                |                                                                                                                                                                                                                                              |
| US2013259755 AA | 20131003 | LSPB | +     | published / reissued                     |                                                                                                                                                                                                                                              |
| US2013259755 AA | 20130402 | LSAS | AS    | ASSIGNMENT                               | OWNER NAME : KOREA INSTITUTE OF MACHINERY AND MATERIALS, KOREA, R<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:KIM, HONG SUK; CHO, GYU BAEK; LEE, JUN HO; AND OTHERS; REEL/FRAME:030131/0343<br>EFFECTIVE DATE : 20130325 |
| US9381466 BB    | 20160705 | LSGT | +     | granted / extensions (spc, cpc, pte)     |                                                                                                                                                                                                                                              |
| US9381466 BB    | 20160615 | LSGT | PAT1  | Patented Case                            |                                                                                                                                                                                                                                              |
| US9381466 BB    | 20330402 | PEXP |       | Calculated Patent Term Expiry            |                                                                                                                                                                                                                                              |

**Title:** APPARATUS AND METHOD FOR DISPENSING DISINFECTANT COMPOSITIONS FOR DISINFECTING WATER SYSTEMS AND LINES

**Abstract:** Source: US6142170A In accordance with the present invention, there is provided an asepsis dispenser apparatus for dispensing disinfectant solutions for cleansing and decontaminating the contaminated surfaces of dental, food and medical equipment, which equipment is connected to a water source by a water inlet line. The asepsis dispenser apparatus includes a **housing** having an interior compartment for holding in place first and second storage canisters, containing a first disinfectant composition and a second disinfectant composition. The asepsis dispenser apparatus further includes a **two-way** solenoid **valve** connected to both of the first and second storage canisters, and a three-way solenoid **valve** connected to the three-way solenoid **valve**, wherein the three-way solenoid **valve** is for **controlling** the water source supplied to the water inlet line which is connected to the dental, food or medical equipment. In addition, the asepsis dispenser apparatus includes a programmable timing **controller** device for opening and closing the solenoid **valves** in order to **control** the first and second storage canisters for supplying the first disinfectant composition or the second disinfectant composition to the contaminated surfaces; and a 9 volt battery power supply for supplying electrical power to both solenoid **valves** and to the programmable timing **controller** device.

**Classifications:**

**International (IPC 8-9):** A61C1/00 B08B9/02

B08B9/035 (Advanced/Invention);

A61C1/00 B08B9/02 (Core/Invention)

**International (IPC 1-7):** B08B9/027 B08B9/27

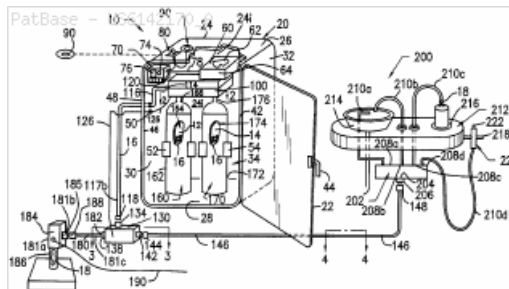
**CPC:** E03C1/126 A61C1/0076 B08B9/0325 Y10T137/4259

Y10T137/6855 Y10T137/86389 Y10T137/86405

**European:** A61C1/0054 B08B9/032B6 E03C1/126

**US:** 134/102.2 134/169C 134/171 134/30 134/94.1 134/95.1

134/99.1 137/240 137/624.11 137/624.13 137/899 222/148 312/209



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US6142170 A        | 20001107         | US19980047550      | 19980325         |

**Priority:**

US19980047550 19980325

**Probable Assignee:**

BELFER WILLIAM A

**Assignee(s):** (std):

BELFER WILLIAM A ; PETILLO PHILLIP J

**Inventor(s):** (std):

BELFER WILLIAM A ; PETILLO PHILLIP J

**Legal status (INPADOC)**

View legal status timeline

| Patent      | Date recorded | Event group | Code  | Event                                                                   | Details                   |
|-------------|---------------|-------------|-------|-------------------------------------------------------------------------|---------------------------|
| US6142170 A | 20001107      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                    |                           |
| US6142170 A | 20041108      | LSLE        | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                           |
| US6142170 A | 20041208      | LSLE        | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                           |
| US6142170 A | 20050104      | LSLE        | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20041107 |
| US6142170 A | 20180325      | PEXP        |       | Calculated Patent Term Expiry                                           |                           |

**Title:** APPARATUS FOR **CONTROLLING** THE TEMPERATURE OF AN INDUCTIVELY HEATED DRAW ROLL

**Abstract:** Source: US3686460A The signal processing device for **controlling** the supply of heat energy to the heating coil utilizes a circuit in which a signal is produced in proportion to the resistance of the roll. The signal is obtained from signals proportional to the voltage measured in the coil and the current in the coil. The proportional signal is then used to shut off or open the supply of heat energy to the coil if the signal exceeds or falls below a pre-set signal corresponding to the desired roll temperature.

**Classifications:**

**International (IPC 8-9):** D02J13/00 G05D23/24

H05B6/14 (Advanced/Invention);

D02J13/00 G05D23/20 H05B6/14 (Core/Invention)

**International (IPC 1-7):** B21B27/06 D01D11/00 D02J1/22 D02J13/00

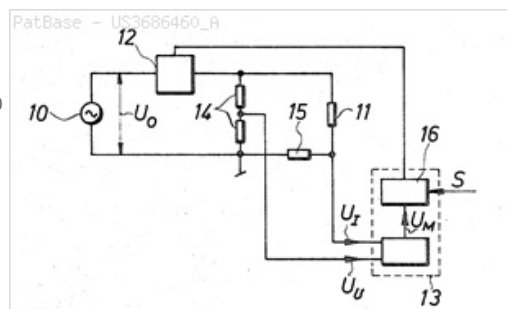
G01K7/16 G05B11/16 G05B11/42 G05D23/00 G05D23/20

G05D23/24 H05B3/02 H05B9/00 H05B9/06

**CPC:** D02J13/005 G05D23/2401 H05B6/145

**European:** D02J13/00D G05D23/24A H05B6/14R

**US:** 219/471 219/619 219/636 219/663



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CH527934 A         | 19720915         | CH19700011160      | 19700723         |
| DE2039717 A1       | 19720127         | DE19702039717      | 19700810         |
| DE2039717 B2       | 19760205         | DE19702039717      | 19700810         |
| DE2039717 C3       | 19760923         | DE19702039717      | 19700810         |
| FR2099338 A5       | 19720310         | FR19710027018      | 19710723         |
| GB1330234 A        | 19730912         | GB19710034688      | 19710723         |
| NL7110107 A        | 19720125         | NL19710010107      | 19710722         |
| US3686460 A        | 19720822         | US19710164577      | 19710721         |

**Priority:**

CH19700011160 19700723

**Probable Assignee:** RIETER AG MASCHF

**Assignee(s):** (std): RIETER MASCHF AG ; RIETER AG MASCHF

**Assignee(s):** MASCHINENFABRIK RIETER AG ; RIETER MACHINE WORKS LTD ; MASCHF RIETER AG ; MASCHINENFABRIK RIETER

**Inventor(s):** (std): HANSRUEDI LAMPARTER ; LAMPARTER HANSRUEDI ; LAMPARTER HANSRUEDI DIPL EL TE ; SPESCHA GELLI ANTON ; SPESCHA GELLI DR

**Inventor(s):** LAMPARTER HANSRUEDI DIPL ELTECHN ; GELLI ANTON SPESCHA ; LAMPARTER HANSRUEDI DIPL EL TECHN

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                               | Details |
|--------------|---------------|-------------|-------|-----------------------------------------------------|---------|
| CH527934 A   | 19720915      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |         |
| CH527934 A   | 19780228      | LSLE        | -PL   | PATENT CEASED                                       |         |
| CH527934 A   | 19900723      | PEXP        |       | Calculated Patent Term Expiry                       |         |
| DE2039717 A1 | 19720127      | LSPB        | +     | published / reissued                                |         |
| DE2039717 A1 | 19760923      | LSGT        | +C3   | GRANT AFTER TWO PUBLICATION STEPS (3RD PUBLICATION) |         |
| DE2039717 A1 | 19840809      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                |         |
| DE2039717 B2 | 19760205      | LSPB        | +     | published / reissued                                |         |
| DE2039717 C3 | 19760923      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |         |
| FR2099338 A5 | 19720310      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |         |
| FR2099338 A5 | 19790921      | LSLE        | -ST   | NOTIFICATION OF LAPSE                               |         |
| FR2099338 A5 | 19910723      | PEXP        |       | Calculated Patent Term Expiry                       |         |
| GB1330234 A  | 19730912      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |         |
| GB1330234 A  | 19740123      | LSGT        | +PS   | PATENT SEALED                                       |         |
| GB1330234 A  | 19840314      | LSLE        | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE    |         |
| GB1330234 A  | 19910723      | PEXP        |       | Calculated Patent Term Expiry                       |         |
| NL7110107 A  | 19720125      | LSPB        | +     | published / reissued                                |         |
| US3686460 A  | 19720822      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |         |

**Title:** UEBERFLUTUNGSSICHERUNG WASHING MACHINE OVERFLOW SAFEGUARD - WITH A **TWO-WAY** MAGNETIC **VALVE** AND **ELECTRONIC** CIRCUIT

**Abstract:** Source: DE2350117A1 Patentansprueche; 1 berflutungssicherung zur Verhinderung unvorhersehbarer Ueberflutungen in Raeumen und Gebaeuden mit Frisch- oder Ab wasser von defekten Wasch- und Spuelvorrichtungen, insbe sondere von automatischen Wasch- und Spuelmaschinen, dadurch gekennzeichnet, dass eine elektrisch angeschlossene Ueber- flutungssicherung in die Wasserzulaufleitung einer Wasch oder Spuelvorrichtung, insbesondere einer automatischen Wasch- oder Spuelmaschine gesetzt wird, dass die Ueberflutungs sicherung als Kompaktgeraet mit einem Gehaeuse (39) ausgebil det aus einem Zweiwegemagnetventil und einem elektronischen Steuerverstaerker mit einem Relais (35) besteht, wobei der Verstaerker ueber ein elektrisches Kabel (71) mit einer Elek trode (72) verbunden ist, dass die Elektrode (72) zwei von einander isolierte, elektrisch leitende Belaege (74) hat und flach-am Boden in der Naehe einer Wasch- oder Spuelmaschine angebracht ist und zwar so, dass die Elektrode (72) bei Aus bruch von Frisch- oder Abwasser mit diesen Fluessigkeiten be netzt wird, wobei die #eitfaehigkeit der Fluessigkeiten erfasst und ueber den Steuerverstaerker mit dem Relais (35) das Zwei wegemagnetventil in Absperrstellung gesteuert wird, damit eine weitere Wasserzufuhr verhindert wird 2. The overflow safety device for automatic washing machines is arranged in the water supply pipe and comprises a **two-way** magnetic **valve** and an **electronic** amplifier circuit with a relay connected to an electrode which is arranged flat in the base of the washing machine so that in the event of a leak the electrode becomes wet and the information is passed on to the **valve** via circuit and relay, the **valve** is closed and any further flow is stopped. A magnetic switch is pref. built into the overflow safety **valve** so that the switch can operate simultaneously with the **two way valve** and turn off the power supply to the machine when an overflow occurs.

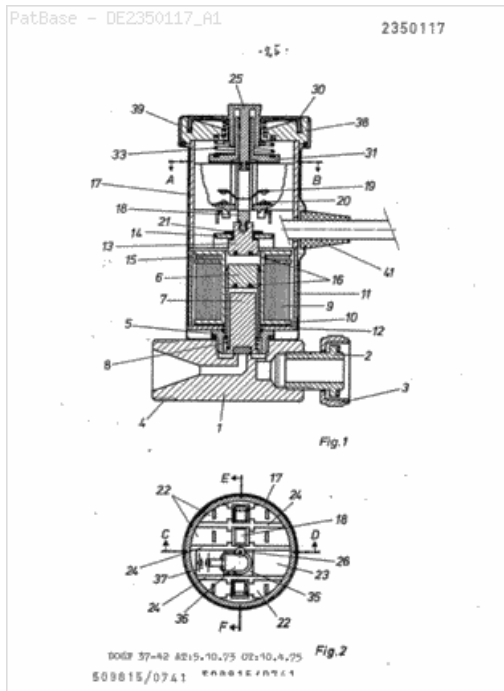
**Classifications:**

**International (IPC 8-9):** D06F39/08 H01H35/42 (Advanced/Invention); D06F39/08 H01H35/42 (Core/Invention)

**International (IPC 1-7):** D06F37/42 D06F39/08

**CPC:** D06F39/081 H01H35/42

**European:** D06F39/08B H01H35/42



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE2350117 A1       | 19750410         | DE19732350117      | 19731005         |

**Priority:**

DE19732350117 19731005

**Probable Assignee:**

HUBER HEINZ

**Assignee(s):** (std):

HUBER HEINZ

**Inventor(s):** (std):

HUBER HEINZ

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                  | Details |
|--------------|---------------|-------------|-------|----------------------------------------|---------|
| DE2350117 A1 | 19750410      | LSPB        | +     | published / reissued                   |         |
| DE2350117 A1 | 19841011      | LSLE        | -8139 | DISPOSAL/NON-PAYMENT OF THE ANNUAL FEE |         |

**Title:** SEQUENTIAL **VALVE** AND DRAIN FOR SNOW GUN

**Abstract:** Source: US4717072A A feed device for automatically **controlling** the operation of a snow gun, the device having an axially displaceable slide to selectively feed air and water under pressure to the snow gun and bleed water from the device, the device incorporating a **control** system including a geared motor for moving the slide, a conversion module for operating the geared motor in accordance with the outputs of sensors positioned to determine outlet water pressure, temperature and humidity at the site of the snow gun, the conversion module being operatively connected to a central computer adapted to **control** the operation of a series of snow guns and feed devices located along a ski slope.

**Classifications:**

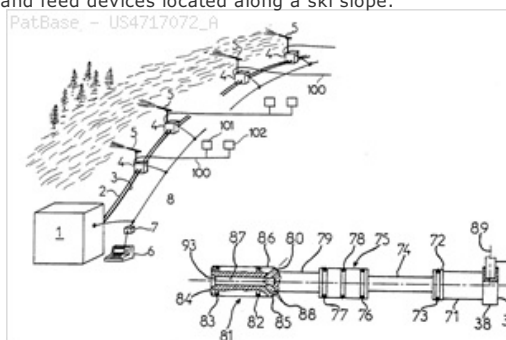
**International (IPC 8-9):** F16K11/07 F25C3/04 (Advanced/Invention);  
F16K11/065 F25C3/00 (Core/Invention)

**International (IPC 1-7):** E01H4/02 F25C3/04

**CPC:** Y10T137/1353 Y10T137/1963 F25C3/04 F16K11/0716  
F25C2303/0481

**European:** F16K11/07 F16K11/07E F25C3/04 R25C303/0481

**US:** 137/62 137/79 239/415 239/75



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT41224 E          | 19890315         | AT19850402297T     | 19851125         |
| CA1298477 A1       | 19920407         | CA19850495617      | 19851119         |
| DE0187563 T1       | 19870521         | DE19850402297T     | 19851125         |
| DE3568629 D1       | 19890413         | DE19853568629      | 19851125         |
| EP0187563 A1       | 19860716         | EP19850402297      | 19851125         |
| EP0187563 B1       | 19890308         | EP19850402297      | 19851125         |
| ES549278 A0        | 19870901         | ES19850549278      | 19851126         |
| ES8708050 A1       | 19870901         | ES19850549278      | 19851126         |
| FR2573854 A1       | 19860530         | FR19840018236      | 19841127         |
| FR2573854 B1       | 19870424         | FR19840018236      | 19841127         |
| JP1811021 C3       | 19931227         | JP19850263962      | 19851126         |
| JP5017468 B4       | 19930309         | JP19850263962      | 19851126         |
| JP61197971 A2      | 19860902         | JP19850263962      | 19851126         |
| US4717072 A        | 19880105         | US19850802043      | 19851126         |

**Priority:**

CA19850495617 19851119 EP19850402297 19851125 FR19840018236 19841127

**Probable Assignee:** YORK FRANCE AIRCHAL SA

**Assignee(s):** (std): LE FROID IND YORK ; YORK FROID IND SA ; YORK FROID IND ; LE FUIOWA ANDEYUSUTORIERU BURI ; YORK SA FROID IND

**Assignee(s):** FROID IND YORK ; FROID IND YORK LE ; FROID INDUSTRIEL YORK ; FROID INDUSTRIEL YORK LE ; GIRARDIN PIERRE ; LE FROID IND ; YORK FRANCE AIRCHAL SA ; YORK FROID INDUSTRIEL ; LE FROID INDUSTRIEL YORK S A CARQUEFOU FR ; LE FROID INDUSTRIEL YORK S A ; LE FROID INDUSTRIEL YORK ; YOOKU FURANSU SA ; LE FUIOWA ANDEYUSUTORIERU BURIZONNOO YOOKU SA ; LE FROID IND YORK Z I 1 RUE DE BEL AIR 44471 CARQU ; YORK FRANCE SA ; LE FROID IND YORK SA ; LE FROID IND YORK Z I 1 RUE DE BEL AIR 44471 CARQUEFOU CEDEX FRANCE A CORP OF FRANCE

**Inventor(s):** (std): GIRARDIN PIERRE ; JIIRARUDEIN PIEERU

**Inventor(s):** PIERRE GIRARDIN ; GIRARDIN PIERRE F 44800 SAINT HERBLAIN FR

**Agent(s):** GOWLING LAFLEUR HENDERSON LLP

**Designated states:** AT CH DE IT LI SE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                                       | Details |
|--------------|---------------|-------------|-------|-------------------------------------------------------------|---------|
| AT41224 E    | 19890315      | LSGT        | +     | granted / extensions (spc, cpc, pte)                        |         |
| AT41224 E    | 19891115      | LSPB        | +UEP  | PUBLICATION OF TRANSLATION OF EUROPEAN PATENT SPECIFICATION |         |
| AT41224 E    | 19951115      | LSAS        | EEIH  | CHANGE IN THE PERSON OF PATENT OWNER                        |         |
| AT41224 E    | 20060215      | LSLE        | -EELA | CANCELLED DUE TO LAPSE OF TIME                              |         |
| AT41224 E    | 20051125      | PEXP        |       | Calculated Patent Term Expiry                               |         |
| CA1298477 A1 | 19920407      | LSGT        | +     | granted / extensions (spc, cpc, pte)                        |         |
| CA1298477 A1 | 20040407      | LSLE        | -MKLA | LAPSED                                                      |         |

|              |          |       |       |                                                                                       |                                                                                                              |
|--------------|----------|-------|-------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| CA1298477 A1 | 20090407 | PEXP  |       | Calculated Patent Term Expiry                                                         |                                                                                                              |
| DE0187563 T1 | 19870521 | LSPB  | +     | published / reissued                                                                  |                                                                                                              |
| DE3568629 D1 | 19900405 | LSGT  | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                               |                                                                                                              |
| DE3568629 D1 | 19960509 | LSAS  | 8327  | CHANGE IN THE PERSON/NAME/ADDRESS OF THE PATENT OWNER                                 | OWNER NAME : YORK FRANCE AIRCHAL S.A., CARQUEFOU, FR                                                         |
| DE3568629 D1 | 20040923 | LSLE  | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                                  |                                                                                                              |
| EP0187563 A1 | 19860716 | LSPB  | +     | published / reissued                                                                  |                                                                                                              |
| EP0187563 A1 | 19870107 | LSSES | +17P  | REQUEST FOR EXAMINATION FILED                                                         | EFFECTIVE DATE : 19860924                                                                                    |
| EP0187563 A1 | 19870722 | LSSES | +17Q  | FIRST EXAMINATION REPORT                                                              | EFFECTIVE DATE : 19870605                                                                                    |
| EP0187563 A1 | 19900228 | LSGT  | +26N  | NO OPPOSITION FILED                                                                   |                                                                                                              |
| EP0187563 A1 | 19950915 | LSAS  | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PFA<br>DESCRIPTION : YORK FRANCE S.A.                        |
| EP0187563 A1 | 19950915 | LSAS  | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PUE<br>OWNER NAME : YORK FRANCE AIRCHAL                      |
| EP0187563 A1 | 19951110 | LSAS  | ITPR  | IT: CHANGES IN OWNERSHIP OF A EUROPEAN PATENT                                         | OWNER NAME : CESSIONE;<br>YORK FRANCE AIRCHAL S.A.                                                           |
| EP0187563 A1 | 20021119 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : SE<br>PAYMENT DATE : 20021119<br>YEAR OF FEE PAYMENT : 18                                 |
| EP0187563 A1 | 20030110 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20030110<br>YEAR OF FEE PAYMENT : 18                                 |
| EP0187563 A1 | 20030206 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : CH<br>PAYMENT DATE : 20030206<br>YEAR OF FEE PAYMENT : 18                                 |
| EP0187563 A1 | 20031126 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : SE<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20031126 |
| EP0187563 A1 | 20031130 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : CH<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20031130 |
| EP0187563 A1 | 20031130 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : LI<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20031130 |
| EP0187563 A1 | 20040602 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20040602 |
| EP0187563 A1 | 20040629 | LSLE  | -EUG  | SE: EUROPEAN PATENT HAS LAPSED                                                        |                                                                                                              |
| EP0187563 A1 | 20040715 | LSLE  | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                           |
| EP0187563 A1 | 20041116 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : AT<br>PAYMENT DATE : 20041116<br>YEAR OF FEE PAYMENT : 20                                 |
| EP0187563 B1 | 19890308 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                              |
| ES8708050 A1 | 19870901 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                              |
| ES8708050 A1 | 20070901 | PEXP  |       | Calculated Patent Term Expiry                                                         |                                                                                                              |
| FR2573854 A1 | 19860530 | LSPB  | +     | published / reissued                                                                  |                                                                                                              |
| FR2573854 A1 | 19950609 | LSAS  | TP    | TRANSMISSION OF                                                                       |                                                                                                              |

| PROPERTY      |          |      |       |                                      |                                                                                                                                                                                              |
|---------------|----------|------|-------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FR2573854 B1  | 19870424 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                              |
| FR2573854 B1  | 20041127 | PEXP |       | Calculated Patent Term Expiry        |                                                                                                                                                                                              |
| JP1811021 C3  | 19931227 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                              |
| JP1811021 C3  | 20051126 | PEXP |       | Calculated Patent Term Expiry        |                                                                                                                                                                                              |
| JP5017468 B4  | 19930309 | LSPB | +     | published / reissued                 |                                                                                                                                                                                              |
| JP61197971 A2 | 19860902 | LSPB | +     | published / reissued                 |                                                                                                                                                                                              |
| US4717072 A   | 19880105 | LSGT | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                              |
| US4717072 A   | 19851126 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : LE FROID INDUSTRIEL YORK, Z. I. 1, RUE DE BEL AIR, DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNOR:GIRARDIN, PIERRE; REEL/FRAME:004489/0387 EFFECTIVE DATE : 19851029 |
| US4717072 A   | 19871105 | LSGT | PAT1  | Patented Case                        |                                                                                                                                                                                              |
| US4717072 A   | 19910617 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                      |
| US4717072 A   | 19950630 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                      |
| US4717072 A   | 19951011 | LSAS | AS    | ASSIGNMENT                           | OWNER NAME : YORK FRANCE AIRCHAL S.A., FRANCE DESCRIPTION : MERGER; ASSIGNOR:YORK FRANCE S.A.; REEL/FRAME:007656/0813 EFFECTIVE DATE : 19910415                                              |
| US4717072 A   | 19990706 | LSFE | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                                     |

## Title: PHOTOELECTRIC SHAFT ANGULAR POSITION-TO-CODE CONVERTER

**Abstract:** Source: SU822118T Invention relates to automation and computer technology and can be used in digital follower and **control** systems objects containing DCM. Known digital converters, angle (CPA), based on the use of mechanical scanning m; antuYu (dei scale 1.2. CPU of this type are called parametric CPA them especially in E exhibit with the support and presence of signalnot-sensitive elements, which in conjunction a quantizing element HbiM coupled with the drive is carried out conversion into electrical quantized values g quanta sensitive elements and characterized by a certain number of zones of conditions kotqeye different from each other. Thus, for example, for the inductive and capacitive sensors ugleto claw cavities for photoelectric sensors angle - straight to the opacity and transparency, etc. fs. disadvantage CPU data is vvzka tochnost.preobrazovani angle cooperatives conditionality difficulties are made quantizing scale with small increments. known parametric CPU containing drive, an associated magnetic drum, which instead on aoeerhnosti "are two tracks, three readers gopovki (system), the block digital readout, consisting of a **valve** trigger counter n, and one of them is applied oona risk (Tetrad - shtrshs) as a magnetized strip, and other - marked at regular intervals quantizing risks. Opposite the first track has two dismountable head, one of which is stationary and Q) CAA - bonded to the shaft, rotation of which is converted into the code. Head coupled with start and stoavhodami trigger a **control valve**, a third head, forming counting pulses, located opposite the second track 2. Disadvantages of this gfeobrazovatel v15spots low precision application of magnetic lines on barabanj low recording density of ticks per unit length of the quantizing track. Closest to the proposed technical nature of the converter is based on the photoelectric principle, information retrieval and comprising a **housing**, Q) ivod planted on his drive shaft with measuring radial grid, with the index disk radial grid mounted on the measured emom shaft drive with index radial grid, fixed rigidly in korpupe, illuminator ITATION and photodetector system, blocks the formation Rovani start and stop signals, the **control** unit, the pulse counter and block figure howling shshvkaaii 4j. Danko device has a relatively low accuracy measurements due nevysokeytochnostyu fs ming start and stop pulses and ps reshnostyu quantizing scale. The purpose of the invention - to increase the accuracy of the photoelectric converter y la shaft rotation into a number. This goal is achieved by the fact that in the photoelectric converter crank angle in number, containing ksrpus, which is rigidly attached directly dvizhn1y index disc with radial grid, the drive shaft is kotsch th orifice disk with radial "grid, moving the index disc with radial grid, mounted on the shaft measured emom, bitmap encoders, including lighting and photodetector system, the first phase raster angle sensor has a measuring index and the fixed wheels with radial raster, and the second - measuring index and fixed-disk radial raster blocks frmirovani start- and stop signals, the first and second outputs forming unit start-signal connected to the first and second ring **control** unit, respectively, the first and outputs blszha form ming stoplight connected with the third and fourth inputs of the **control** unit or, respectively, the pulse counter which outputs connected to the inputs of the correspond-ing digital indication on measuring, index moving and stationary discs with radial raster additionally located fiducial and 3 respectively show a part of the measuring disc and the movable part and the fixed index} on disk touches the measuring disc with a raster-arranged radyPyymi hi reperkyh touches are applied at equal intervals along the entire length of its circumference, and one of them is formed by relation to other elongated index for disks with radial, bitmaps located on two benchmark stroke, which are deposited one above; fugim introduced quantization unit phase delay unit counting pulses and pulse unit, pack of and mind triggers, straight outputs are connected to the first inputs of AND gates whose outputs are connected to respective inputs blszha collection pulses KOTqporo output connected to the input pulse counter, the phase output of the first phase of the raster upla sensor connected to input odaim forming unit start signal and the input of the quantization phase, the output of which is connected a delay block counting pulses corresponding outputs are connected to second inputs of AND gates, outputs of the first fiducial raster phase angle sensor connected to the respective inputs scheugimi forming unit start-sygnala, phase and phase vtsrogo fiducials outputs raster angle sensor connected to the respective inputs of the stop-forming a signal **control** unit outputs are connected to respective inputs hi triggers. In addition, the **control** unit includes decoders, pulse counters and elements, and the output of the first AND gate is connected to the set input: the first zero pulse counter, the outputs of which are connected to respective inputs of the first decoder, whose output is connected to the corresponding inputs per unit In Position triggers output And the second element is connected to the set input of a zero-second pulse counter which outputs are connected to respective inputs vtorsmgo decoder vkody which are connected to respective inputs of setting to zero ti triggers, second and fourth **control** unit connected to the counting input of the first and second pulse counter respectively, and with **control** inputs of the first and second decoders. Fig. 1 is a schematic design of the transducer, the overall view; Fig. 2 5th Fig. 4 and 5 shows structural sesemy converter and **control** unit. Photoelectric converter y la rotation of the shaft in a number contains Bldg 1, the drive shaft 3 2j measuring disk drive 4.c radial grid, fixed disk 5 with radial grid movable plate 6 with a radial grid shaft 7, the angular position in which the transformation razuets code lighting system 8 9 photoreception system, measuring groove 10 raster, raster and radial index, which touches fiducials 12, Tetrad elongated bar 13 index fiducials shtrihi.14, phase raster sensors 15 and 16 angle blocks 17 and 18 form the start and stop signals; Phase quantization block 19; Unit 2 delay counting pulses; AND gates 21; collection unit 22 pulses, triggers 23; **control** unit 24, the counter 25 to them, pulses; digital display unit 26; counters 27 and 28 pulses; AND gates 29 and LP; decoders 31 and 32. Fig. 1-5 introduce the following notation: the angular step touches radial raster SE; V «« W-respectively angular position of Mr. HP direct measurement, and the rolling of nepodvzhns bitmap index drives 4-6; Accordingly, the voltage outputs of the phase angle sensors 15 and 16; v v 1 as well. Pt.a sootvetsyvenno benchmark voltage sensor outputs 15 and 16; vv respectively start and stop erased stoplights To eliminate errors from eccentric disks 4-6 risiteta phase dates sors channels 15 and 16 are **two-way** schitshaniem (Fig. 1). The angular distance between reference strokes 12 and 12, and 13 power 2K/ni. The electrodeless lighting 8 and 9 photodetecting system disks 4 and 5 are a ssyvokupnosti sensor 15 and osetitelna 8 and 9 photodetecting system, dispersion and 6 acid 4 - sensor 16 which comprise the phase and the reference channel Flats rent ivfor tion (Figure 1 - 3). The photoelectric converter operates as follows. At a constant rotation of the disk drive 2 phase 4 sensor outputs 15 and 16 readings taken nagf voltage VQ. 86 bond which matured Qi(-, p - "p), qj nP linearly dependent step within the W on the differences of the angular positions of disks 4 and 5 and 4 and 6, respectively. These stresses nocrynaioT blocks forming start-n stoplight (R) 17 and 18 and section 19 of the quantization fazi Last forms one count pulse for each phase increment equal. - That corresponds to the pitch angle kvaytovani value-K. At a time when the elongated bar 13 Tetrad drive past 4 prsasodit benchmark index stroke 14 fixed disc 5 on benchmark outputs are generated by the sensor 15 and voltage Un (Jn, which come H41 unit 17 forming start-signazhzh where Up, U for bop uglovs accurate fixation of position I start strobed voltage pulses generated at the time (C) f 0. As a result, 17 vkodah produce. VCTQP with pulses and Vjj-fgpi-, input to the **control** unit 24.Last 23 runs to the start trigger (single) state. When this element is opened and 21, and count pulses from the first output blrka 20 delay counting pulses begin to pass through the element of K 21 and 22 blezh collection pulses at counter input pulse.. 25; After this alignment with a reference stroke 14 disc 5 each () benchmark 12 strokes disc 4 results. to run only one in the starting state, respectively, 23 and triggers every time with the start ocherepnogo Trigg and 23 pulse counter 25 continues counting counting pulses, triggers vyzvanHbix previous 23 starts, starts to count further counting pulses, snimaemos next in order, the delay unit 20 counting pulses. When udlinenny Tetrad bar 13 drive 4 passes benchmark 14 strokes movable disk 6 on reperkyh sensor output voltages are generated 16 Upa. and similarly Uoj blszh forming stoplight 18 vyrabatyuat U.T.OP, cTon KOT (4) bie, was on the input **control** unit 24 is set trigger is 23 to state Stop. The element 21 thus closes. After about ETS Consultation {eepernogo touch with each disc 14 NZ (rti-1) remaining touches 12 meter drive leads poledovatelno 4 to return all (Ii-1) triggers 23 sosgo of Stoa and zakryvanto (I1-1) and 21 elements; At the moment when the last of the open zakroets elemengov And 21 pulse counting is stopped and the pulse counter 25 is equal to fix code codes,, u, I kotfyh in each liter is the digital equivalent of the angular position of the movable disk index. 6 relative to the fixed disc 5 of the index, i.e. W - Chpr-MPR Arithmetic average kod.N i i is the end result of converting the crank angle in number. High accuracy, which is - can a life obtained using the proposed CPA is explained by the fact that two revolutions of the disk 4, ie for one cycle of mechanical scanning quantizing scale, manufactured W transformations angle of start-stop code. And each of the transformations carried out, using the form M1fovani for start-stop-lamps searches the pulses of different plot (R) scanning track of the disc 4 (quantum scale), we have the guide error, different in magnitude and sign at its different sites as otherwise it will not contribute to error dependent upon the angle and encoded can be considered in the characteristics of gradation conversion, the **control** unit 24 (Fig. 5) operates as follows. At the moment of the occurrence of the start signal Start V (R) output The coincidence circuit occurs at 2 coincidence pulse which resets the counter 27 to zero state. Simultaneously, V start pulse is applied to the counter 27. The output is on the last codeword corresponding number pivot-on start. The decoder 31 decodes it and stop T entered the **control** input deshifregora 31, leads to the appearance of n output a bound to the trigger 23, a single signal that triggers it in the Start state. In the future, everyone is counted once V start pulse counter 27 and reads the output of the decoder 31, the start of the next trigger pulse



**Title:** AUTOMATIC POWER TRANSMISSION **CONTROL** SYSTEM

**Abstract:** Source: US3776048A An automatic power transmission **control** system for a vehicle driven by an engine having a carburetor throttle **valve** which **control** system comprises a shift **control** unit to cause shifting of different gear reduction ratios in accordance with a signal representative of an effective opening area of the throttle **valve** and a signal representative of a vehicle speed, and a shift pattern generator circuit associated with the shift **control** unit and responsive to a signal representing a closed condition of the throttle **valve** for modifying the shift pattern whereby a downshift is effected from a lower gear reduction ratio to a higher gear reduction ratio regardless of the vehicle speed to provide sufficient engine braking action when the closed condition of the throttle **valve** is sensed.

**Classifications:**

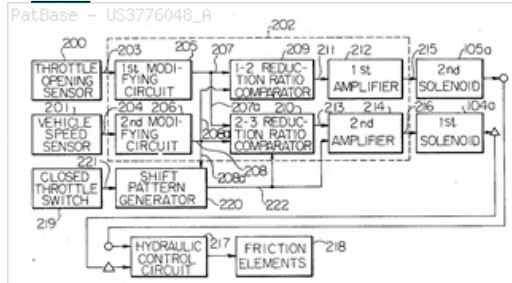
**International (IPC 8-9):** F16H59/24 F16H61/10 F16H61/21 F16H63/02 (Advanced/Invention); F16H59/22 F16H61/02 (Advanced/Non-invention); F16H59/24 F16H61/10 F16H61/21 F16H63/02 (Core/Invention); F16H59/18 F16H61/02 (Core/Non-invention)

**International (IPC 1-7):** B60K21/02 B60K41/06 B60K41/18 F16H5/60 F16H5/64 F16H5/66 H01H36/00

**CPC:** Y10T477/691 Y10T477/693762 F16H61/21 B60K2704/04 F16H59/22 F16H61/0206

**European:** B60K41/00 F16H61/21 L60K704/04 R16H59/22 R16H61/02E1L

**US:** 192/222 477/119 477/149 74/86.6 74/866



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CA969642 A1        | 19750617         | CA19720131618      | 19720104         |
| DE2165707 A1       | 19720831         | DE19712165707      | 19711230         |
| DE2165707 B2       | 19760805         | DE19712165707      | 19711230         |
| DE2165707 C3       | 19770310         | DE19712165707      | 19711230         |
| GB1337772 A        | 19731121         | GB19710041440      | 19710906         |
| JP52020630 B4      | 19770604         | JP19710004730      | 19710208         |
| US3776048 A        | 19731204         | US19710177603      | 19710903         |

**Priority:**

JP19710004730 19710208

**Probable Assignee:** NISSAN MOTOR

**Assignee(s):** (std): NISSAN MOTOR

**Assignee(s):** NISSAN MOTOR CO LTD JA ; NISSAN MOTOR CO LTD ; NISSAN MOTOR COMPANY LIMITED ; AKAISHI TAKAYUKI ; ENOMOTO KOJI ; ISHIMARU WATARU

**Inventor(s):** (std): AKAISHI T ; AKAISHI TAKAYUKI ; ENOMOTO K ; ENOMOTO KOJI ; ISHIMARU W ; ISHIMARU WATARU

**Inventor(s):** ISHIMARU W JA ; ENOMOTO K JA ; AKAISHI T JA

**Legal status (INPADOC)**

View legal status timeline

| Patent        | Date recorded | Event group | Code  | Event                                               | Details |
|---------------|---------------|-------------|-------|-----------------------------------------------------|---------|
| DE2165707 A1  | 19720831      | LSPB        | +     | published / reissued                                |         |
| DE2165707 A1  | 19770310      | LSGT        | +C3   | GRANT AFTER TWO PUBLICATION STEPS (3RD PUBLICATION) |         |
| DE2165707 A1  | 19790607      | LSLI        | EF    | WILLINGNESS TO GRANT LICENCES                       |         |
| DE2165707 A1  | 19880121      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                |         |
| DE2165707 B2  | 19760805      | LSPB        | +     | published / reissued                                |         |
| DE2165707 C3  | 19770310      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |         |
| GB1337772 A   | 19731121      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |         |
| GB1337772 A   | 19740403      | LSGT        | +PS   | PATENT SEALED                                       |         |
| GB1337772 A   | 19790531      | LSLI        | 746   | REGISTER NOTED 'LICENCES OF RIGHT' (SECT. 46/1977)  |         |
| GB1337772 A   | 19830407      | LSLE        | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE    |         |
| GB1337772 A   | 19910906      | PEXP        |       | Calculated Patent Term Expiry                       |         |
| JP52020630 B4 | 19770604      | LSPB        | +     | published / reissued                                |         |
| US3776048 A   | 19731204      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |         |

**Title:** ROTARY INTERNAL COMBUSTION ENGINE AND ITS **CONTROL** SYSTEM

**Abstract:** Source: RU2126488C

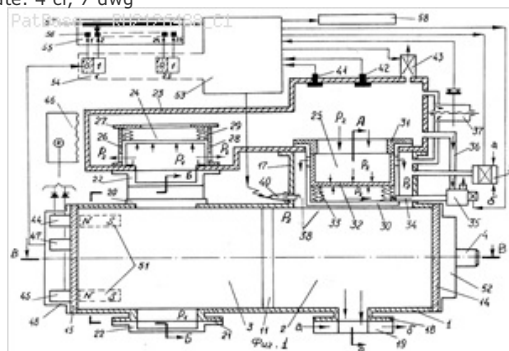
FIELD: transport engineering; internal combustion engines with shaped rotors. SUBSTANCE: rotary internal combustion engine has compressor chamber following shape of working chamber. Rotors of working chamber are installed coaxially with rotors of engine. Receiver with suction and pressure-relief **valves** is arranged over engine. Manifold is located above **housing**. Pressure-relief **valve** is installed in **housing** space. Fuel evaporator is located under exhaust manifold of working chamber. Air duct rounds side surface of **housing**. Rotors of engine and compressor are of same profile, with two and more blades, with clearance between blades and between blades and engine **housing**. Suction and pressure-relief **valve** of receiver are made in form of cylindrical **housing** with cover, movable cylinder and springs. Suction **valve** is provided with holes in lower part of cylindrical **housing**, and pressure-relief **valve** is provided with holes in upper part, and springs are arranged, respectively, under cover of **housing** and under movable cylinder. Engine **control** system has power **control** (accelerator) pedal, differential pressure gauge and **two-way** electromagnetic compressed air selector switch, all connected with **electronic control** unit. Power **control** pedal is connected with **electronic** counter and is made for choosing number of half-revolutions of rotor. **Two-way** electromagnetic selector switch is connected with receiver, its pressure-relief **valve** and atmosphere, and differential pressure gauge is connected with receiver and combustion chamber. EFFECT: enlarged power **control** range, possibility of using fuel turned into gaseous state. 4 cl, 7 dwg

**Classifications:**

**International (IPC 8-9):** F02B55/00 (Advanced/Invention);

F02B55/00 (Core/Invention)

**International (IPC 1-7):** F02B55/00



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| RU2126488 C1       | 19990220         | RU19970104226      | 19970318         |
| RU97104226 A       | 19990327         | RU19970104226      | 19970318         |

**Priority:**

RU19970104226 19970318

**Probable Assignee:** SIL CHENKO NIKOLAJ EFIMOVICH  
**Assignee(s):** (std): SIL CHENKO NIKOLAJ EFIMOVICH  
**Assignee(s):** SIL'CHENKO NIKOLAJ EFIMOVICH  
**Inventor(s):** (std): SIL CHENKO N E ; SIL CHENKO V N  
**Inventor(s):** SIL'CHENKO N.E. ; SIL'CHENKO V.N.

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code | Event                                | Details |
|--------------|---------------|-------------|------|--------------------------------------|---------|
| RU2126488 C1 | 19990220      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| RU2126488 C1 | 20170318      | PEXP        |      | Calculated Patent Term Expiry        |         |
| RU97104226 A | 19990327      | LSPB        | +    | published / reissued                 |         |

**Title:** BENKATINA HYDROELECTRIC TURBINE

**Abstract:** Source: US2009160193A New hydroelectric turbine devices, systems, and methods, based on recirculation of fluid through at least one turbine, offer the potential for less costly and greater energy output in many applications.

**Classifications:**

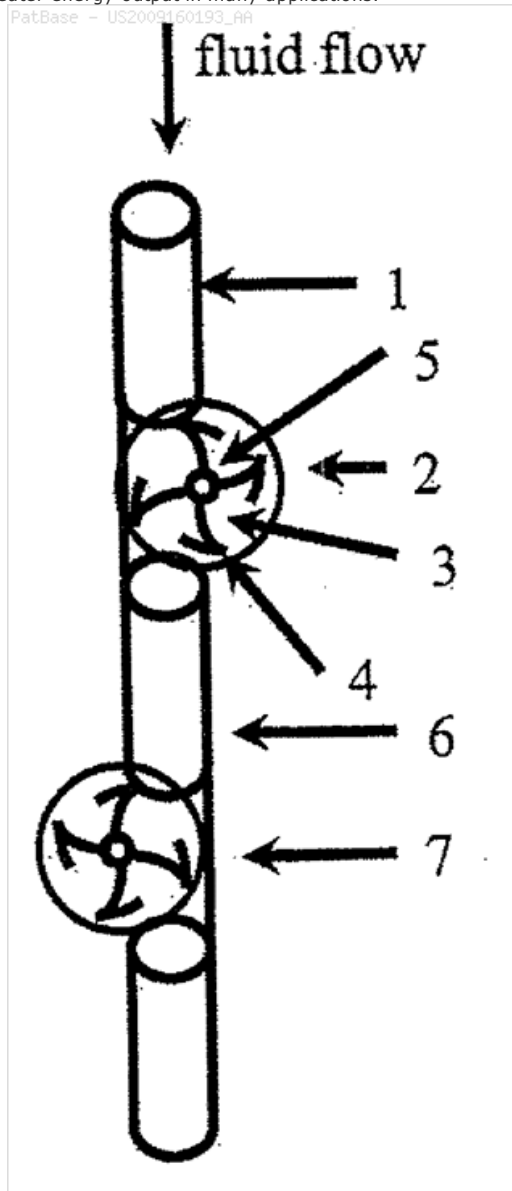
**International (IPC 8-9):** B21K25/00 B23P15/00 B23P15/02 F01D1/30 F01D15/10 F01D17/00 F01D23/00 F01D25/24 F01D5/00 F01D5/14 F03B11/02 F03B13/00 F03B13/10 F03B13/12 F03B13/14 F03B13/16 F03B13/18 F03B13/22 F03B15/00 F03B3/00 F03B3/18 F03B7/00 F03B9/00 F03D1/04 F03D11/02 F03D17/06 F03D3/04 F03D3/06 F03D5/06 F03D9/00 F04D27/00 F04D29/38 F04D29/54 F15D1/00 F15D1/10 F16D31/02 G01T1/29 H02K7/18 (Advanced/Invention); F03B13/00 (Advanced/Non-invention); B21K25/00 B23P15/00 F01D1/00 F01D15/00 F01D17/00 F01D23/00 F01D25/24 F01D5/00 F01D5/14 F03B11/00 F03B13/00 F03B15/00 F03B3/00 F03B7/00 F03B9/00 F03D1/00 F03D3/00 F03D5/00 F03D9/00 F04D29/40 F16D31/02 G01T1/00 (Core/Invention); F03B F03D G01T (Subclass/Invention)

**International (IPC 1-7):** F03B13/00 F03B13/10 G01T1/29

**CPC:** Y02E10/20 F03B13/1815 F03B13/184 F05B2210/18 Y02E10/38 Y10T29/49336 Y10T29/49321 F05B2220/602 F05B2240/40 Y02B10/50 F05B2240/13 Y02B10/30 Y02B10/70 F03D15/00 F03D3/068 F03D1/04 F03D5/04 F03G7/00 F05B2210/16 F05B2220/709 H02K7/06 H02K7/11 H02K49/10 H02N2/18 Y02E10/70 Y02E10/72 Y02E10/74

**European:** F03B13/00 F03B13/18B2B F03B13/18B4F F03D1/04 F03D11/02 F03D3/06E6B F03D5/04 F03G7/00 H02K49/10 H02K7/06 H02K7/11 H02N2/18 R05B210/16 R05B210/18 R05B220/602 R05B220/709 R05B240/13 R05B240/40 Y02B10/30 Y02B10/50 Y02B10/70 Y02E10/20 Y02E10/38 Y02E10/70 Y02E10/72 Y02E10/74

**US:** 29/889.21 29/889.210S 29/889.7 29/889.700S 290/42 290/42P 290/43 290/43S 290/44 290/53 290/53S 290/54 290/54P 290/54S 290/55 290/55S 415/1 415/151 415/151S 415/182.1 415/182.100S 415/183 415/183S 415/1P 415/1S 415/2.1 415/2.100S 415/208.1 415/208.100S 415/4.3 415/4.300P 415/60 415/60S 416/131 416/131P 416/182 416/182S 416/223.00RS 416/223R 60/398



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AP200804521 A0     | 20080630         | AP20080004521      | 20080630         |
| AU2007203953 AA    | 20070712         | AU20070203953      | 20070102         |
| AU2007264740 AA    | 20080103         | AU20070264740      | 20070625         |
| AU2007264740 AB    | 20090212         | AU20070264740      | 20070625         |
| AU2007274645 AA    | 20080124         | AU20070274645      | 20070318         |
| BRPI0707103 A2     | 20110419         | BR2007PI07103      | 20070102         |
| BRPI0715047 A2     | 20150422         | BR2007PI15047      | 20070318         |
| CA2618022 AA       | 20080205         | CA20072618022      | 20070102         |
| CA2618022 C        | 20170711         | CA20072618022      | 20070102         |
| CA2651157 AA       | 20081103         | CA20072651157      | 20070429         |
| CA2656138 AA       | 20081222         | CA20072656138      | 20070625         |
| CA2656795 AA       | 20090105         | CA20072656795      | 20070318         |
| CA2656795 C        | 20160621         | CA20072656795      | 20070318         |
| CN101558235 A      | 20091014         | CN200780034589     | 20070318         |
| CN101652561 A      | 20100217         | CN200780001993     | 20070102         |
| EA200900038 A1     | 20090630         | EA20090000038      | 20070318         |
| EP1969227 A2       | 20080917         | EP20070700696      | 20070102         |
| EP1969227 A4       | 20120620         | EP20070700696      | 20070102         |
| EP2013472 A2       | 20090114         | EP20070736263      | 20070429         |
| EP2032839 A2       | 20090311         | EP20070766802      | 20070625         |
| EP2032839 A4       | 20120523         | EP20070766802      | 20070625         |
| EP2044462 A2       | 20090408         | EP20070713367      | 20070318         |
| EP2044462 A4       | 20120613         | EP20070713367      | 20070318         |

|                 |          |                |          |
|-----------------|----------|----------------|----------|
| IL189308 A0     | 20080807 | IL20070189308  | 20070102 |
| IL195109 A0     | 20090922 | IL20070195109  | 20070429 |
| IL196097 A0     | 20090901 | IL20070196097  | 20070625 |
| IL196438 A0     | 20090922 | IL20090196438  | 20090111 |
| IL196438 A1     | 20130930 | IL20070196438  | 20070318 |
| IN00095CN2009 A | 20090529 | IN2009CN00095  | 20090106 |
| IN00650CN2008 A | 20081128 | IN2008CN00650  | 20080207 |
| IN07121CN2008 A | 20090327 | IN2008CN07121  | 20081224 |
| JP2009540169 T2 | 20091119 | JP20080549103T | 20070102 |
| JP2010507036 T2 | 20100304 | JP20090520126T | 20070318 |
| JP5080497 B2    | 20121121 | JP20080549103T | 20070102 |
| KR20080084797 A | 20080919 | KR20087005830  | 20070102 |
| MA31404 B1      | 20100601 | MA20080030636  | 20080208 |
| MX2009000175 A1 | 20090320 | MX20090000175  | 20070625 |
| MX2009000739 A1 | 20090130 | MX20090000739  | 20070318 |
| NZ565797 A      | 20111222 | NZ20070565797  | 20070102 |
| RU2008151731 A  | 20100810 | RU20080151731  | 20070625 |
| US2009160193 AA | 20090625 | US20080342084  | 20081223 |
| US2009185905 AA | 20090723 | US20070299314  | 20070429 |
| US2009243293 AA | 20091001 | US20070997906  | 20070102 |
| US2009290972 AA | 20091126 | US20070307748  | 20070318 |
| US2011188990 AA | 20110804 | US20110020023  | 20110203 |
| US8143736 BB    | 20120327 | US20070997906  | 20070102 |
| US8188611 BB    | 20120529 | US20070307748  | 20070318 |
| WO07077555 A2   | 20070712 | WO2007IL00003  | 20070102 |
| WO07077555 A3   | 20090423 | WO2007IL00003  | 20070102 |
| WO07129299 A2   | 20071115 | WO2007IL00523  | 20070429 |
| WO07129299 A3   | 20090423 | WO2007IL00523  | 20070429 |
| WO08001358 A2   | 20080103 | WO2007IL00770  | 20070625 |
| WO08001358 A3   | 20090430 | WO2007IL00770  | 20070625 |
| WO08010200 A2   | 20080124 | WO2007IL00348  | 20070318 |
| WO08010200 A3   | 20090319 | WO2007IL00348  | 20070318 |
| ZA200801192 A   | 20090729 | ZA20080001192  | 20080205 |
| ZA200810649 A   | 20100825 | ZA20080010649  | 20081218 |

**Priority:**

|                |          |                |          |                |          |
|----------------|----------|----------------|----------|----------------|----------|
| IL20080189308  | 20080205 | IL20080195109  | 20081104 | US20060755846P | 20060104 |
| US20060746375P | 20060504 | IL20090196438  | 20090111 | IL20080196097  | 20081221 |
| US20060805875P | 20060627 | US20060823256P | 20060823 | US20060807489P | 20060716 |
| US20060826927P | 20060926 | US20060807828P | 20060720 | US20060807828  | 20060720 |
| US20060823256P | 20060826 | US20060805875P | 20060622 | US20060864792P | 20061108 |
| US20060866070P | 20061116 | US20070908693P | 20070329 | WO2007IL00003  | 20070102 |
| WO2007IL00523  | 20070429 | US20070908693P | 20070323 | WO2007IL00770  | 20070625 |
| WO2007IL00348  | 20070318 | US20080342084  | 20081223 | US20070299314  | 20070429 |
| US20070997906  | 20070102 | US20070307748  | 20070318 | US20110020023  | 20110203 |

**Probable Assignee:** FARB DANIEL IL

**Assignee(s):** (std): DANIEL FARB ; FARB DANIEL ; FARB DANIEL IL

**Assignee(s):** FAVRE DANIEL ; FARD DANIEL ; DR MARK FRIEDMAN LTD

**Inventor(s):** (std): FARB DANIEL ; DANIEL FARB

**Inventor(s):** FARD DANIEL

**Agent(s):** BELLATOR PATENT AND TRADE MARK ATTORNEYS; BELLATOR; INTEGRAL IP; WHITE DUNCAN ROHAN; DR MARK FRIEDMAN LTD; DR MARK M FRIEDMAN C O BILL POLKINGHORN DISCOVERY DISPATCH; MARK M; FRIEDMAN MARK

**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent          | Date recorded | Event group | Code | Event                                                                               | Details                                                                                                                                                                                                                   |
|-----------------|---------------|-------------|------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AU2007203953 AA | 20130725      | LSLE        | -MK4 | APPLICATION LAPSED SECTION 142(2)(D) - NO CONTINUATION FEE PAID FOR THE APPLICATION |                                                                                                                                                                                                                           |
| AU2007264740 AA | 20090402      | LSRE        | DA3  | AMENDMENTS MADE SECTION 104                                                         | DESCRIPTION : THE NATURE OF THE AMENDMENT IS: AMEND THE PRIORITY DETAILS TO READ 60/908,693 23 MAR 2007 US; 60/805,875 27 JUN 2006 US; 60/823,256 26 AUG 2006 US; 60/864,792 08 NOV 2006 US AND 60/826,927 26 SEP 2006 US |
| AU2007264740 AA | 20130131      | LSLE        | -MK4 | APPLICATION LAPSED SECTION 142(2)(D) - NO CONTINUATION FEE PAID FOR THE             |                                                                                                                                                                                                                           |

|                 |          |       |       |                                                                                                                      |                           |
|-----------------|----------|-------|-------|----------------------------------------------------------------------------------------------------------------------|---------------------------|
| AU2007274645 AA | 20131017 | LSLE  | -MK4  | APPLICATION<br>APPLICATION<br>LAPSED SECTION<br>142(2)(D) - NO<br>CONTINUATION<br>FEE PAID FOR<br>THE<br>APPLICATION |                           |
| BRPI0707103 A2  | 20110419 | LSPB  | +     | published /<br>reissued                                                                                              |                           |
| BRPI0715047 A2  | 20150422 | LSPB  | +     | published /<br>reissued                                                                                              |                           |
| CA2618022 AA    | 20080205 | LSPB  | +     | published /<br>reissued                                                                                              |                           |
| CA2618022 AA    | 20080205 | LSNP  | +AFNE | NATIONAL PHASE<br>ENTRY                                                                                              |                           |
| CA2618022 AA    | 20111229 | LSSES | +EEER | EXAMINATION<br>REQUEST                                                                                               |                           |
| CA2618022 AA    | 20120106 | LSSES | +EEER | EXAMINATION<br>REQUEST                                                                                               | EFFECTIVE DATE : 20111229 |
| CA2618022 C     | 20170711 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                                           |                           |
| CA2618022 C     | 20270102 | PEXP  |       | Calculated<br>Patent Term<br>Expiry                                                                                  |                           |
| CA2651157 AA    | 20081103 | LSPB  | +     | published /<br>reissued                                                                                              |                           |
| CA2651157 AA    | 20081103 | LSNP  | +AFNE | NATIONAL PHASE<br>ENTRY                                                                                              |                           |
| CA2651157 AA    | 20130624 | LSLE  | -FZDE | DEAD                                                                                                                 | EFFECTIVE DATE : 20130429 |
| CA2656138 AA    | 20081222 | LSPB  | +     | published /<br>reissued                                                                                              |                           |
| CA2656138 AA    | 20081222 | LSNP  | +AFNE | NATIONAL PHASE<br>ENTRY                                                                                              |                           |
| CA2656138 AA    | 20120626 | LSLE  | -FZDE | DEAD                                                                                                                 |                           |
| CA2656138 AA    | 20120822 | LSLE  | -FZDE | DEAD                                                                                                                 | EFFECTIVE DATE : 20120626 |
| CA2656795 AA    | 20090105 | LSPB  | +     | published /<br>reissued                                                                                              |                           |
| CA2656795 AA    | 20090105 | LSNP  | +AFNE | NATIONAL PHASE<br>ENTRY                                                                                              |                           |
| CA2656795 AA    | 20120209 | LSSES | +EEER | EXAMINATION<br>REQUEST                                                                                               |                           |
| CA2656795 AA    | 20120224 | LSSES | +EEER | EXAMINATION<br>REQUEST                                                                                               | EFFECTIVE DATE : 20120209 |
| CA2656795 C     | 20160621 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                                           |                           |
| CA2656795 C     | 20270318 | PEXP  |       | Calculated<br>Patent Term<br>Expiry                                                                                  |                           |
| CN101558235 A   | 20091014 | LSPB  | +     | published /<br>reissued                                                                                              |                           |
| CN101558235 A   | 20091014 | LSPB  | +C06  | PUBLICATION                                                                                                          |                           |
| CN101558235 A   | 20130731 | LSRV  | -C12  | REJECTION OF A<br>PATENT<br>APPLICATION<br>AFTER ITS<br>PUBLICATION                                                  |                           |
| CN101652561 A   | 20100217 | LSPB  | +     | published /<br>reissued                                                                                              |                           |
| CN101652561 A   | 20100217 | LSPB  | +C06  | PUBLICATION                                                                                                          |                           |
| CN101652561 A   | 20130116 | LSDW  | -C02  | DEEMED<br>WITHDRAWAL<br>OF PATENT<br>APPLICATION<br>AFTER<br>PUBLICATION<br>(PATENT LAW<br>2001)                     |                           |
| EA200900038 A1  | 20090630 | LSPB  | +     | published /<br>reissued                                                                                              |                           |
| EP1969227 A2    | 20080917 | LSPB  | +     | published /<br>reissued                                                                                              |                           |
| EP1969227 A2    | 20080917 | LSSES | +17P  | REQUEST FOR<br>EXAMINATION                                                                                           | EFFECTIVE DATE : 20080208 |

|              |          |      |      |                                         |                                             |
|--------------|----------|------|------|-----------------------------------------|---------------------------------------------|
|              |          |      |      | FILED                                   |                                             |
| EP1969227 A2 | 20090527 | LSES | R17D | SEARCH REPORT (CORRECTION)              | EFFECTIVE DATE : 20090423                   |
| EP1969227 A2 | 20090701 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F03B 13/12<br>20060101AFI20090527BHEP |
| EP1969227 A2 | 20120620 | LSES | +A4  | DESPATCH OF SUPPLEMENTARY SEARCH REPORT | EFFECTIVE DATE : 20120518                   |
| EP1969227 A2 | 20120620 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F03B 13/12<br>20060101AFI20120511BHEP |
| EP1969227 A2 | 20140115 | LSDW | -18D | DEEMED TO BE WITHDRAWN                  | EFFECTIVE DATE : 20130801                   |
| EP2013472 A2 | 20090114 | LSPB | +    | published / reissued                    |                                             |
| EP2013472 A2 | 20090527 | LSES | R17D | SEARCH REPORT (CORRECTION)              | EFFECTIVE DATE : 20090423                   |
| EP2013472 A2 | 20090617 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F03D 9/00<br>20060101AFI20090512BHEP  |
| EP2013472 A2 | 20090617 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F03D 5/06<br>20060101ALI20090512BHEP  |
| EP2013472 A2 | 20091125 | LSES | +17P | REQUEST FOR EXAMINATION FILED           | EFFECTIVE DATE : 20091015                   |
| EP2013472 A2 | 20100428 | LSWD | -18W | WITHDRAWN                               | EFFECTIVE DATE : 20100318                   |
| EP2032839 A2 | 20090311 | LSPB | +    | published / reissued                    |                                             |
| EP2032839 A2 | 20090603 | LSES | R17D | SEARCH REPORT (CORRECTION)              | EFFECTIVE DATE : 20090430                   |
| EP2032839 A2 | 20090805 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F03B 7/00<br>20060101AFI20090626BHEP  |
| EP2032839 A2 | 20090805 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F03B 11/02<br>20060101ALI20090626BHEP |
| EP2032839 A2 | 20091118 | LSES | +17P | REQUEST FOR EXAMINATION FILED           | EFFECTIVE DATE : 20091007                   |
| EP2032839 A2 | 20120523 | LSES | +A4  | DESPATCH OF SUPPLEMENTARY SEARCH REPORT | EFFECTIVE DATE : 20120424                   |
| EP2032839 A2 | 20120523 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F03B 7/00<br>20060101AFI20120418BHEP  |
| EP2032839 A2 | 20120523 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F03B 11/02<br>20060101ALI20120418BHEP |
| EP2032839 A2 | 20120523 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F03B 13/00<br>20060101ALI20120418BHEP |
| EP2032839 A2 | 20130814 | LSDW | -18D | DEEMED TO BE WITHDRAWN                  | EFFECTIVE DATE : 20121122                   |
| EP2044462 A2 | 20090408 | LSPB | +    | published / reissued                    |                                             |
| EP2044462 A2 | 20090422 | LSES | R17D | SEARCH REPORT (CORRECTION)              | EFFECTIVE DATE : 20090319                   |
| EP2044462 A2 | 20090429 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F03D 9/00<br>20060101AFI20090320BHEP  |
| EP2044462 A2 | 20090429 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F03B 9/00<br>20060101ALI20090320BHEP  |
| EP2044462 A2 | 20090429 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F01D 23/00<br>20060101ALI20090320BHEP |
| EP2044462 A2 | 20090429 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F03B 13/00<br>20060101ALI20090320BHEP |
| EP2044462 A2 | 20090429 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F16D 31/02<br>20060101ALI20090320BHEP |
| EP2044462 A2 | 20090429 | LSRE | RIC1 | CLASSIFICATION (CORRECTION)             | IPC : F01D 5/00<br>20060101ALI20090320BHEP  |

|                 |          |       |       |                                                                               |                                                                                |
|-----------------|----------|-------|-------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| EP2044462 A2    | 20091111 | LSSES | +17P  | REQUEST FOR EXAMINATION FILED                                                 | EFFECTIVE DATE : 20090901                                                      |
| EP2044462 A2    | 20120613 | LSSES | +A4   | DESPATCH OF SUPPLEMENTARY SEARCH REPORT                                       | EFFECTIVE DATE : 20120510                                                      |
| EP2044462 A2    | 20120613 | LSRE  | RIC1  | CLASSIFICATION (CORRECTION)                                                   | IPC : F03B 13/00<br>20060101ALI20120504BHEP                                    |
| EP2044462 A2    | 20120613 | LSRE  | RIC1  | CLASSIFICATION (CORRECTION)                                                   | IPC : F01D 23/00<br>20060101ALI20120504BHEP                                    |
| EP2044462 A2    | 20120613 | LSRE  | RIC1  | CLASSIFICATION (CORRECTION)                                                   | IPC : F01D 5/00<br>20060101ALI20120504BHEP                                     |
| EP2044462 A2    | 20120613 | LSRE  | RIC1  | CLASSIFICATION (CORRECTION)                                                   | IPC : F03B 9/00<br>20060101ALI20120504BHEP                                     |
| EP2044462 A2    | 20120613 | LSRE  | RIC1  | CLASSIFICATION (CORRECTION)                                                   | IPC : F03D 9/00<br>20060101ALI20120504BHEP                                     |
| EP2044462 A2    | 20120613 | LSRE  | RIC1  | CLASSIFICATION (CORRECTION)                                                   | IPC : F16D 31/02<br>20060101ALI20120504BHEP                                    |
| EP2044462 A2    | 20120613 | LSRE  | RIC1  | CLASSIFICATION (CORRECTION)                                                   | IPC : F03D 1/04<br>20060101AFI20120504BHEP                                     |
| EP2044462 A2    | 20140305 | LSDW  | -18D  | DEEMED TO BE WITHDRAWN                                                        | EFFECTIVE DATE : 20131001                                                      |
| IL196438 A1     | 20130930 | LSPB  | +     | published / reissued                                                          |                                                                                |
| IN00095CN2009 A | 20090529 | LSPB  | +     | published / reissued                                                          |                                                                                |
| IN00650CN2008 A | 20081128 | LSPB  | +     | published / reissued                                                          |                                                                                |
| IN07121CN2008 A | 20090327 | LSPB  | +     | published / reissued                                                          |                                                                                |
| JP2009540169 T2 | 20091119 | LSPB  | +     | published / reissued                                                          |                                                                                |
| JP2009540169 T2 | 20110721 | LSSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                           | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20110720 |
| JP2009540169 T2 | 20110721 | LSSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                           | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20110720 |
| JP2009540169 T2 | 20111028 | LSRE  | A521  | WRITTEN AMENDMENT                                                             | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20111027 |
| JP2009540169 T2 | 20120424 | LSSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                           | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20120423 |
| JP2009540169 T2 | 20120705 | LSRE  | A521  | WRITTEN AMENDMENT                                                             | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20120704 |
| JP2009540169 T2 | 20120807 | LSGT  | +TRDD | DECISION OF GRANT OR REJECTION WRITTEN                                        |                                                                                |
| JP2009540169 T2 | 20120814 | LSGT  | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A01<br>EFFECTIVE DATE : 20120813  |
| JP2009540169 T2 | 20120816 | LSGT  | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A01                               |
| JP2009540169 T2 | 20120906 | LSFE  | +A61  | FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)                         | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20120830  |
| JP2009540169 T2 | 20120907 | LSFE  | +FPAY | RENEWAL FEE                                                                   | DESCRIPTION : PAYMENT UNTIL:                                                   |

|                 |          |      |       |                                                                               |                                                                             |                                     |
|-----------------|----------|------|-------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------|
|                 |          |      |       |                                                                               | PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                            | 20150907<br>YEAR OF FEE PAYMENT : 3 |
| JP2009540169 T2 | 20120907 | LSGT | +R150 | CERTIFICATE OF PATENT OR REGISTRATION OF UTILITY MODEL                        | DESCRIPTION : JAPANESE INTERMEDIATE CODE: R150                              |                                     |
| JP2010507036 T2 | 20100304 | LSPB | +     | published / reissued                                                          |                                                                             |                                     |
| JP2010507036 T2 | 20100311 | LSES | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION                                   | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20100310 |                                     |
| JP2010507036 T2 | 20100311 | LSES | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION                                   | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20100310 |                                     |
| JP2010507036 T2 | 20120321 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                           | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20120319 |                                     |
| JP2010507036 T2 | 20120321 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                           | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20120319 |                                     |
| JP2010507036 T2 | 20120904 | LSRV | -A02  | DECISION OF REFUSAL                                                           | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A02<br>EFFECTIVE DATE : 20120903  |                                     |
| JP5080497 B2    | 20121121 | LSGT | +     | granted / extensions (spc, cpc, pte)                                          |                                                                             |                                     |
| JP5080497 B2    | 20110721 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                           | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20110720 |                                     |
| JP5080497 B2    | 20111028 | LSRE | A521  | WRITTEN AMENDMENT                                                             | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20111027 |                                     |
| JP5080497 B2    | 20120424 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                           | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20120423 |                                     |
| JP5080497 B2    | 20120705 | LSRE | A521  | WRITTEN AMENDMENT                                                             | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20120704 |                                     |
| JP5080497 B2    | 20120807 | LSGT | +TRDD | DECISION OF GRANT OR REJECTION WRITTEN                                        |                                                                             |                                     |
| JP5080497 B2    | 20120814 | LSGT | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A01<br>EFFECTIVE DATE : 20120813  |                                     |
| JP5080497 B2    | 20120816 | LSGT | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A01                               |                                     |
| JP5080497 B2    | 20120906 | LSFE | +A61  | FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)                         | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20120830  |                                     |
| JP5080497 B2    | 20120907 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                  | DESCRIPTION : PAYMENT UNTIL: 20150907<br>YEAR OF FEE PAYMENT : 3            |                                     |
| JP5080497 B2    | 20120907 | LSGT | +R150 | CERTIFICATE OF PATENT OR REGISTRATION OF UTILITY MODEL                        | DESCRIPTION : JAPANESE INTERMEDIATE CODE: R150                              |                                     |
| JP5080497 B2    | 20150915 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                                                        | DESCRIPTION : JAPANESE INTERMEDIATE CODE: R250                              |                                     |
| JP5080497 B2    | 20270102 | PEXP |       | Calculated Patent Term Expiry                                                 |                                                                             |                                     |

|                 |          |      |       |                                                              |                                                                                                                                                                                   |
|-----------------|----------|------|-------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KR20080084797 A | 20080919 | LSPB | +     | published /<br>reissued                                      |                                                                                                                                                                                   |
| KR20080084797 A | 20120203 | LSDW | -WITN | WITHDRAWAL<br>DUE TO NO<br>REQUEST FOR<br>EXAMINATION        |                                                                                                                                                                                   |
| MA31404 B1      | 20100601 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                   |                                                                                                                                                                                   |
| MA31404 B1      | 20280208 | PEXP |       | Calculated<br>Patent Term<br>Expiry                          |                                                                                                                                                                                   |
| MX2009000175 A1 | 20090320 | LSPB | +     | published /<br>reissued                                      |                                                                                                                                                                                   |
| MX2009000739 A1 | 20090130 | LSPB | +     | published /<br>reissued                                      |                                                                                                                                                                                   |
| MX2009000739 A1 | 20160331 | LSWD | -FA   | ABANDONMENT<br>OR<br>WITHDRAWAL                              |                                                                                                                                                                                   |
| NZ565797 A      | 20111222 | LSPB | +     | published /<br>reissued                                      |                                                                                                                                                                                   |
| NZ565797 A      | 20120427 | LSGT | +PSEA | PATENT SEALED                                                |                                                                                                                                                                                   |
| NZ565797 A      | 20130222 | LSFE | +RENW | RENEWAL<br>(RENEWAL FEES<br>ACCEPTED)                        | TEXT : PATENT RENEWED FOR 3<br>YEARS UNTIL 02 JAN 2014 BY LEA<br>SKYLLERSTEDT<br>EFFECTIVE DATE : 20130130                                                                        |
| NZ565797 A      | 20140131 | LSFE | +RENW | RENEWAL<br>(RENEWAL FEES<br>ACCEPTED)                        | TEXT : PATENT RENEWED FOR 3<br>YEARS UNTIL 02 JAN 2017 BY LEA<br>SKYLLERSTEDT<br>EFFECTIVE DATE : 20131231                                                                        |
| NZ565797 A      | 20170127 | LSFE | +RENW | RENEWAL<br>(RENEWAL FEES<br>ACCEPTED)                        | TEXT : PATENT RENEWED FOR 1<br>YEAR UNTIL 02 JAN 2018 BY<br>CHRISTINA SUNNERCRANTZ<br>EFFECTIVE DATE : 20161228                                                                   |
| RU2008151731 A  | 20100810 | LSPB | +     | published /<br>reissued                                      |                                                                                                                                                                                   |
| US2009160193 AA | 20090625 | LSPB | +     | published /<br>reissued                                      |                                                                                                                                                                                   |
| US2009160193 AA | 20110408 | LSWD | -ABD3 | Abandoned --<br>Failure to<br>Respond to an<br>Office Action |                                                                                                                                                                                   |
| US2009160193 AA | 20121210 | LSAS | AS    | ASSIGNMENT                                                   | OWNER NAME : DR. MARK<br>FRIEDMAN LTD., ISRAEL<br>DESCRIPTION : SECURITY<br>AGREEMENT; ASSIGNOR:FARB,<br>DANIEL; REEL/FRAME:029432/0994<br>EFFECTIVE DATE : 20121209              |
| US2009160193 AA | 20140617 | LSAS | AS    | ASSIGNMENT                                                   | OWNER NAME : FARB, DANIEL,<br>ISRAEL<br>DESCRIPTION : RELEASE OF<br>SECURITY INTEREST;<br>ASSIGNOR:DR. MARK FRIEDMAN<br>LTD.; REEL/FRAME:033188/0807<br>EFFECTIVE DATE : 20140614 |
| US2009185905 AA | 20090723 | LSPB | +     | published /<br>reissued                                      |                                                                                                                                                                                   |
| US2009185905 AA | 20120118 | LSWD | -ABD3 | Abandoned --<br>Failure to<br>Respond to an<br>Office Action |                                                                                                                                                                                   |
| US2009243293 AA | 20091001 | LSPB | +     | published /<br>reissued                                      |                                                                                                                                                                                   |
| US2009290972 AA | 20091126 | LSPB | +     | published /<br>reissued                                      |                                                                                                                                                                                   |
| US2011188990 AA | 20110804 | LSPB | +     | published /<br>reissued                                      |                                                                                                                                                                                   |
| US2011188990 AA | 20121120 | LSWD | -ABD3 | Abandoned --<br>Failure to<br>Respond to an<br>Office Action |                                                                                                                                                                                   |
| US8143736 BB    | 20120327 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                   |                                                                                                                                                                                   |
| US8143736 BB    | 20120307 | LSGT | PAT1  | Patented Case                                                |                                                                                                                                                                                   |
| US8143736 BB    | 20121210 | LSAS | AS    | ASSIGNMENT                                                   | OWNER NAME : DR. MARK<br>FRIEDMAN LTD., ISRAEL<br>DESCRIPTION : SECURITY                                                                                                          |

|               |          |      |       |                                                |                                                                                                                                                                          |
|---------------|----------|------|-------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |          |      |       |                                                | AGREEMENT; ASSIGNOR:FARB, DANIEL; REEL/FRAME:029432/0994<br>EFFECTIVE DATE : 20121209                                                                                    |
| US8143736 BB  | 20140617 | LSAS | AS    | ASSIGNMENT                                     | OWNER NAME : FARB, DANIEL, ISRAEL<br>DESCRIPTION : RELEASE OF SECURITY INTEREST;<br>ASSIGNOR:DR. MARK FRIEDMAN LTD.; REEL/FRAME:033188/0807<br>EFFECTIVE DATE : 20140614 |
| US8143736 BB  | 20160308 | LSFE | +FPAY | FEE PAYMENT                                    | YEAR OF FEE PAYMENT : 4                                                                                                                                                  |
| US8143736 BB  | 20270102 | PEXP |       | Calculated Patent Term Expiry                  |                                                                                                                                                                          |
| US8188611 BB  | 20120529 | LSGT | +     | granted / extensions (spc, cpc, pte)           |                                                                                                                                                                          |
| US8188611 BB  | 20120509 | LSGT | PAT1  | Patented Case                                  |                                                                                                                                                                          |
| US8188611 BB  | 20121210 | LSAS | AS    | ASSIGNMENT                                     | OWNER NAME : DR. MARK FRIEDMAN LTD., ISRAEL<br>DESCRIPTION : SECURITY AGREEMENT; ASSIGNOR:FARB, DANIEL; REEL/FRAME:029432/0994<br>EFFECTIVE DATE : 20121209              |
| US8188611 BB  | 20140617 | LSAS | AS    | ASSIGNMENT                                     | OWNER NAME : FARB, DANIEL, ISRAEL<br>DESCRIPTION : RELEASE OF SECURITY INTEREST;<br>ASSIGNOR:DR. MARK FRIEDMAN LTD.; REEL/FRAME:033188/0807<br>EFFECTIVE DATE : 20140614 |
| US8188611 BB  | 20151025 | LSFE | +FPAY | FEE PAYMENT                                    | YEAR OF FEE PAYMENT : 4                                                                                                                                                  |
| US8188611 BB  | 20281113 | PEXP |       | Calculated Patent Term Expiry (PTA 606 days)   |                                                                                                                                                                          |
| WO07077555 A2 | 20070712 | LSPB | +     | published / reissued                           |                                                                                                                                                                          |
| WO07077555 A3 | 20080205 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE    | REF DOCUMENT NUMBER : 189308<br>COUNTRY OF REF DOCUMENT : IL                                                                                                             |
| WO07077555 A3 | 20080205 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE    | REF DOCUMENT NUMBER : 2618022<br>COUNTRY OF REF DOCUMENT : CA                                                                                                            |
| WO07077555 A3 | 20080205 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE    | REF DOCUMENT NUMBER : 11997906<br>COUNTRY OF REF DOCUMENT : US                                                                                                           |
| WO07077555 A3 | 20080207 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE    | REF DOCUMENT NUMBER : 565797<br>COUNTRY OF REF DOCUMENT : NZ                                                                                                             |
| WO07077555 A3 | 20080208 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE    | REF DOCUMENT NUMBER : 2007700696<br>COUNTRY OF REF DOCUMENT : EP                                                                                                         |
| WO07077555 A3 | 20080212 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE    | REF DOCUMENT NUMBER : 2007203953<br>COUNTRY OF REF DOCUMENT : AU                                                                                                         |
| WO07077555 A3 | 20080306 | LSNP | ENP   | ENTRY INTO THE NATIONAL PHASE IN:              | REF DOCUMENT NUMBER : 2007203953<br>COUNTRY OF REF DOCUMENT : AU<br>DATE OF REF DOCUMENT : 20070102<br>KIND CODE OF REF DOCUMENT : A                                     |
| WO07077555 A3 | 20080306 | LSPB | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE | REF DOCUMENT NUMBER : 2007203953<br>COUNTRY OF REF DOCUMENT : AU                                                                                                         |
| WO07077555 A3 | 20080319 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL          | REF DOCUMENT NUMBER : MX/A/2008/003896<br>COUNTRY OF REF DOCUMENT : MX                                                                                                   |

|               |          |      |      |                                                                  |                                                                                                                                                                     |
|---------------|----------|------|------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WO07077555 A3 | 20080417 | LSNP | +WWE | PHASE<br>WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL<br>PHASE | REF DOCUMENT NUMBER :<br>12008500921<br>COUNTRY OF REF DOCUMENT : PH                                                                                                |
| WO07077555 A3 | 20080626 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL<br>PHASE          | REF DOCUMENT NUMBER :<br>AP/P/2008/004521<br>COUNTRY OF REF DOCUMENT : AP                                                                                           |
| WO07077555 A3 | 20080701 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL<br>PHASE          | REF DOCUMENT NUMBER :<br>2008549103<br>COUNTRY OF REF DOCUMENT : JP                                                                                                 |
| WO07077555 A3 | 20080705 | LSNE | NENP | NON-ENTRY<br>INTO THE<br>NATIONAL PHASE<br>IN:                   | REF COUNTRY CODE : DE                                                                                                                                               |
| WO07077555 A3 | 20080917 | LSPB | +WWP | WIPO<br>INFORMATION:<br>PUBLISHED IN<br>NATIONAL<br>OFFICE       | REF DOCUMENT NUMBER :<br>2007700696<br>COUNTRY OF REF DOCUMENT : EP                                                                                                 |
| WO07077555 A3 | 20110419 | LSNP | ENP  | ENTRY INTO THE<br>NATIONAL PHASE<br>IN:                          | REF DOCUMENT NUMBER :<br>PI0707103<br>COUNTRY OF REF DOCUMENT : BR<br>KIND CODE OF REF DOCUMENT : A2<br>EFFECTIVE DATE : 20080703                                   |
| WO07129299 A2 | 20071115 | LSPB | +    | published /<br>reissued                                          |                                                                                                                                                                     |
| WO07129299 A3 | 20080327 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL<br>PHASE          | REF DOCUMENT NUMBER :<br>2007736263<br>COUNTRY OF REF DOCUMENT : EP                                                                                                 |
| WO07129299 A3 | 20081103 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL<br>PHASE          | REF DOCUMENT NUMBER : 2651157<br>COUNTRY OF REF DOCUMENT : CA                                                                                                       |
| WO07129299 A3 | 20081103 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL<br>PHASE          | REF DOCUMENT NUMBER :<br>12299314<br>COUNTRY OF REF DOCUMENT : US                                                                                                   |
| WO07129299 A3 | 20081105 | LSNE | NENP | NON-ENTRY<br>INTO THE<br>NATIONAL PHASE<br>IN:                   | REF COUNTRY CODE : DE                                                                                                                                               |
| WO08001358 A2 | 20080103 | LSPB | +    | published /<br>reissued                                          |                                                                                                                                                                     |
| WO08001358 A2 | 20080327 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL<br>PHASE          | REF DOCUMENT NUMBER :<br>2007766802<br>COUNTRY OF REF DOCUMENT : EP                                                                                                 |
| WO08001358 A2 | 20081221 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL<br>PHASE          | REF DOCUMENT NUMBER : 196097<br>COUNTRY OF REF DOCUMENT : IL                                                                                                        |
| WO08001358 A2 | 20081222 | LSNP | ENP  | ENTRY INTO THE<br>NATIONAL PHASE<br>IN:                          | REF DOCUMENT NUMBER : 2656138<br>COUNTRY OF REF DOCUMENT : CA                                                                                                       |
| WO08001358 A2 | 20081223 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL<br>PHASE          | REF DOCUMENT NUMBER :<br>2007264740<br>COUNTRY OF REF DOCUMENT : AU                                                                                                 |
| WO08001358 A2 | 20081230 | LSNE | NENP | NON-ENTRY<br>INTO THE<br>NATIONAL PHASE<br>IN:                   | REF COUNTRY CODE : DE                                                                                                                                               |
| WO08001358 A2 | 20090127 | LSNP | ENP  | ENTRY INTO THE<br>NATIONAL PHASE<br>IN:                          | REF DOCUMENT NUMBER :<br>2008151731<br>COUNTRY OF REF DOCUMENT : RU<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) :                                       |
| WO08001358 A2 | 20090129 | LSNP | ENP  | ENTRY INTO THE<br>NATIONAL PHASE<br>IN:                          | REF DOCUMENT NUMBER :<br>2007264740<br>COUNTRY OF REF DOCUMENT : AU<br>DATE OF REF DOCUMENT :<br>20070625<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) : |

|               |          |      |      |                                             |                                                                                                                                                         |
|---------------|----------|------|------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| WO08001358 A2 | 20170919 | LSNP | ENP  | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : PI0714036<br>COUNTRY OF REF DOCUMENT : BR<br>KIND CODE OF REF DOCUMENT : A2<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20081222 |
| WO08010200 A2 | 20080124 | LSPB | +    | published / reissued                        |                                                                                                                                                         |
| WO08010200 A3 | 20080327 | LSNP | +WWE | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE | REF DOCUMENT NUMBER : 2007713367<br>COUNTRY OF REF DOCUMENT : EP                                                                                        |
| WO08010200 A3 | 20090105 | LSNP | +WWE | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE | REF DOCUMENT NUMBER : 2656795<br>COUNTRY OF REF DOCUMENT : CA                                                                                           |
| WO08010200 A3 | 20090107 | LSNP | +WWE | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE | REF DOCUMENT NUMBER : 12307748<br>COUNTRY OF REF DOCUMENT : US                                                                                          |
| WO08010200 A3 | 20090107 | LSNP | +WWE | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE | REF DOCUMENT NUMBER : 2007274645<br>COUNTRY OF REF DOCUMENT : AU                                                                                        |
| WO08010200 A3 | 20090115 | LSNP | +WWE | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE | REF DOCUMENT NUMBER : 2009520126<br>COUNTRY OF REF DOCUMENT : JP                                                                                        |
| WO08010200 A3 | 20090121 | LSNE | NENP | NON-ENTRY INTO THE NATIONAL PHASE IN:       | REF COUNTRY CODE : DE                                                                                                                                   |
| WO08010200 A3 | 20090205 | LSNP | ENP  | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : 2007274645<br>COUNTRY OF REF DOCUMENT : AU<br>DATE OF REF DOCUMENT : 20070318<br>KIND CODE OF REF DOCUMENT : A                    |
| WO08010200 A3 | 20090220 | LSNE | NENP | NON-ENTRY INTO THE NATIONAL PHASE IN:       | REF COUNTRY CODE : RU                                                                                                                                   |
| WO08010200 A3 | 20150422 | LSNP | ENP  | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : PI0715047<br>COUNTRY OF REF DOCUMENT : BR<br>KIND CODE OF REF DOCUMENT : A2<br>EFFECTIVE DATE : 20090116                          |
| ZA200801192 A | 20090729 | LSGT | +    | granted / extensions (spc, cpc, pte)        |                                                                                                                                                         |
| ZA200801192 A | 20280204 | PEXP |      | Calculated Patent Term Expiry               |                                                                                                                                                         |
| ZA200810649 A | 20100825 | LSGT | +    | granted / extensions (spc, cpc, pte)        |                                                                                                                                                         |
| ZA200810649 A | 20281217 | PEXP |      | Calculated Patent Term Expiry               |                                                                                                                                                         |

**Title:** FLUID SUPPLY DEVICE WITH PERIODICALLY POSITIVE AND REVERSE FLOW CLEANING CYCLE

**Abstract:** Source: US4634523A The instant invention provides a fluid supply system, wherein in its working mode a pump delivers fluid through a filter in one direction to a discharge outlet, an improvement comprising a relief outlet and **controlled valve** means interposed between said pump and said discharge outlet and between the pump and the relief outlet, means for selectively **controlling** said **controlled valve** means (1) to effect delivery of fluid from said pump through said filter, in the one direction, and through said **valve** means to said discharge outlet in the working mode, (2) to effect passage of fluid from said pump through said filter, in a direction opposite to the one direction, and through the **valve** means to said relief outlet in reverse cleaning mode and (3) to effect passage of fluid from said pump through said filter, in the one direction, and through the **valve** means to said relief outlet in forward cleaning mode.

**Classifications:**

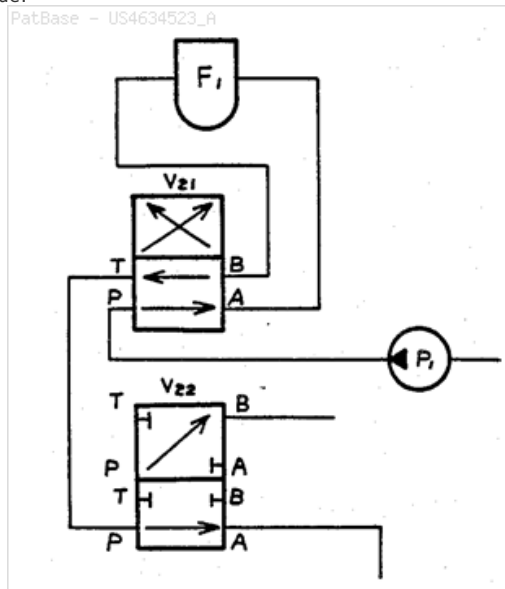
**International (IPC 8-9):** B01D29/00 (Advanced/Invention); B01D29/00 (Core/Invention)

**International (IPC 1-7):** B01D23/24 B01D29/38 B05B7/24 B29C49/42 B29C49/56 B29L24/00 B65D1/24

**CPC:** B01D29/11

**European:** B01D29/00A38B B01D29/00A38D B01D29/38B

**US:** 210/140 210/142 210/143

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| GB2172217 A1       | 19860917         | GB19850006607      | 19850314         |
| GB8506607 A0       | 19850417         | GB19850006607      | 19850314         |
| US4634523 A        | 19870106         | US19850713758      | 19850319         |

**Priority:**

GB19850006607 19850314 US19850713758 19850319

**Probable Assignee:** LIN CHI

**Assignee(s):** (std): LIN CHI ; LIN P

**Assignee(s):** LIN PO CHI ; PO CHI LIN ; TAI HER YANG NO ; TAI HER YANG

**Inventor(s):** (std): LIN PO CHI

**Inventor(s):** PO CHI LIN

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                                                                            | Details                                                                                                                                                         |
|--------------|---------------|-------------|-------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB2172217 A1 | 19860917      | LSPB        | +     | published / reissued                                                                             |                                                                                                                                                                 |
| GB2172217 A1 | 19870722      | LSWD        | -WAP  | APPLICATION WITHDRAWN, TAKEN TO BE WITHDRAWN OR REFUSED ** AFTER PUBLICATION UNDER SECTION 16(1) |                                                                                                                                                                 |
| US4634523 A  | 19870106      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                             |                                                                                                                                                                 |
| US4634523 A  | 19861105      | LSGT        | PAT1  | Patented Case                                                                                    |                                                                                                                                                                 |
| US4634523 A  | 19900816      | LSFE        | +FPAY | FEE PAYMENT                                                                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                         |
| US4634523 A  | 19900907      | LSAS        | AS    | ASSIGNMENT                                                                                       | OWNER NAME : TAI-HER YANG, TAIWAN<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNOR:LIN, PO-CHI; REEL/FRAME:005426/0567<br>EFFECTIVE DATE : 19900831 |
| US4634523 A  | 19940706      | LSFE        | +FPAY | FEE PAYMENT                                                                                      | YEAR OF FEE PAYMENT : 8                                                                                                                                         |
| US4634523 A  | 19990103      | LSLE        | -LAPS | LAPSE FOR FAILURE TO PAY                                                                         |                                                                                                                                                                 |

|             |          |      |     |                                                  |                              |
|-------------|----------|------|-----|--------------------------------------------------|------------------------------|
|             |          |      |     | MAINTENANCE FEES                                 |                              |
| US4634523 A | 19990316 | LSLE | -FP | EXPIRED DUE TO FAILURE TO<br>PAY MAINTENANCE FEE | EFFECTIVE DATE :<br>19990106 |

**Title:** Dual-circuit brake system

**Abstract:** Source: US4819998A A dual-circuit brake system for utility vehicles is disclosed which enables simultaneous anti-skid regulation in two brake circuits (I, II). To this end, the brake cylinders of the axle of the first brake circuit (I) that is equipped with sensors is monitored directly by pressure **control valves** and dependent thereon the brake cylinders of the second brake circuit (II) are monitored via relay **valves**. The circuits are secured from one another via a pressure **control lock valve**.

**Classifications:**

**International (IPC 8-9):** B60T8/34 B60T8/48 B60T8/58 B60T8/88 B60T8/94 (Advanced/Invention);

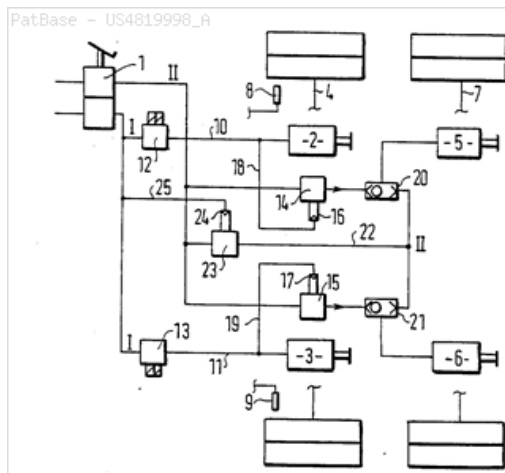
B60T8/34 B60T8/48 B60T8/58 B60T8/88 (Core/Invention)

**International (IPC 1-7):** B60K28/16 B60T15/12 B60T8/26 B60T8/32 B60T8/38 B60T8/58 B60T8/64 B60T8/88

**CPC:** B60T8/349 B60T8/4818 B60T8/58 B60T8/94

**European:** B60T8/34F B60T8/48B2 B60T8/58 B60T8/94

**US:** 188/151A 303/111 303/118 303/118.1 303/123 303/9.73



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE3637420 A1       | 19880505         | DE19863637420      | 19861103         |
| FR2605958 A1       | 19880506         | FR19870015168      | 19871102         |
| FR2605958 B1       | 19900831         | FR19870015168      | 19871102         |
| JP63116969 A2      | 19880521         | JP19870272004      | 19871029         |
| SE8704265 A        | 19880504         | SE19870004265D     | 19871102         |
| SE8704265 A0       | 19871102         | SE19870004265      | 19871102         |
| SE8704265 L        | 19880504         | SE19870004265      | 19871102         |
| US4819998 A        | 19890411         | US19870084070      | 19870811         |

**Priority:**

DE19863637420 19861103

**Probable Assignee:** BOSCH GMBH ROBERT

**Assignee(s):** (std): BOSCH GMBH ROBERT ; ROBERT BOSCH GMBH

**Inventor(s):** (std): EMIG R ; EMIG REINER ; EMIG REINER DIPL ING ; GOEBELS H J ; GOEBELS HERMANN JOSEF ; GOEBELS HERMANN JOSEF ING GRAD ; H J GOEBELS ; HERMANN JOSEF GOEBELS ; HERUMAN YOOZEUF GEEBERUSU ; R EMIG ; RAINAA EEMITSUHI ; REINER EMIG

**Inventor(s):** GOEBELS HERMANN JOSEF ING

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent        | Date recorded | Event group | Code  | Event                                | Details                                                      |
|---------------|---------------|-------------|-------|--------------------------------------|--------------------------------------------------------------|
| DE3637420 A1  | 19880505      | LSPB        | +     | published / reissued                 |                                                              |
| DE3637420 A1  | 19920813      | LSSES       | +8110 | REQUEST FOR EXAMINATION PARAGRAPH 44 |                                                              |
| DE3637420 A1  | 19940120      | LSRV        | -8131 | REJECTION                            |                                                              |
| FR2605958 A1  | 19880506      | LSPB        | +     | published / reissued                 |                                                              |
| FR2605958 A1  | 19940930      | LSLE        | -ST   | NOTIFICATION OF LAPSE                |                                                              |
| FR2605958 B1  | 19900831      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                                                              |
| FR2605958 B1  | 20071102      | PEXP        |       | Calculated Patent Term Expiry        |                                                              |
| JP63116969 A2 | 19880521      | LSPB        | +     | published / reissued                 |                                                              |
| SE8704265 A   | 19880504      | LSPB        | +     | published / reissued                 |                                                              |
| SE8704265 A   | 19950228      | LSLE        | -NAV  | PATENT APPLICATION                   | REF DOCUMENT NUMBER : 8704265-1<br>EFFECTIVE DATE : 19940601 |

|             |          |      |       | HAS LAPSED                                    | FORMAT OF REF DOCUMENT (F/P) : F                                                                                                                                                                                    |
|-------------|----------|------|-------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US4819998 A | 19890411 | LSGT | +     | granted / extensions (spc, cpc, pte)          |                                                                                                                                                                                                                     |
| US4819998 A | 19870811 | LSAS | AS    | ASSIGNMENT                                    | OWNER NAME : ROBERT BOSCH GMBH, STUTTGART, GERMANY<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.;<br>ASSIGNORS:GOEBELS, HERMANN-JOSEF;<br>EMIG, REINER;<br>REEL/FRAME:004758/0010<br>EFFECTIVE DATE : 19870804 |
| US4819998 A | 19890208 | LSGT | PAT1  | Patented Case                                 |                                                                                                                                                                                                                     |
| US4819998 A | 19920925 | LSFE | +FPAY | FEE PAYMENT                                   | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                             |
| US4819998 A | 19970413 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES     |                                                                                                                                                                                                                     |
| US4819998 A | 19970624 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE | EFFECTIVE DATE : 19970416                                                                                                                                                                                           |

**Title:** Brake system for automotive vehicles

**Abstract:** Source: US5826952A PCT No. PCT/EP94/03427 Sec. 371 Date Jul. 1, 1996 Sec. 102(e) Date Jul. 1, 1996 PCT Filed Oct. 18, 1994 PCT Pub. No. WO95/11147 PCT Pub. Date Apr. 27, 1995A brake system for automotive vehicles includes a pressure generator to which wheel brake cylinders associated with the individual vehicle wheels are connected by way of hydraulic connections. Actuator units including a cylinder-and-piston assembly and an actuator are inserted into the hydraulic connections. The actuator units permit shutting off the hydraulic connections. To convert the brake system into an active brake system, when the pressure generator and at least one actuator unit are simultaneously actuated, the force resulting from the pressure build-up in the pressure generator and the external actuating force produced by the actuator are applied jointly to the piston of the cylinder-and-piston assembly.

**Classifications:**

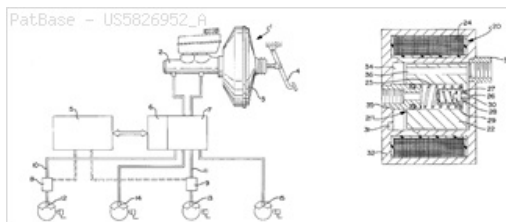
**International (IPC 8-9):** B60T13/68 B60T7/12 B60T7/22 B60T8/24 B60T8/48 (Advanced/Invention)

**International (IPC 1-7):** B60T13/12 B60T13/68 B60T13/74 B60T7/12 B60T7/22 B60T8/36 B60T8/48

**CPC:** B60T7/12 B60T7/22 B60T8/489 B60T13/686

**European:** B60T13/68C B60T7/12 B60T7/22 B60T8/48B4F

**US:** 303/113.2 303/116.2 303/119.2



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE4335676 A1       | 19950420         | DE19934335676      | 19931019         |
| DE59404232 D1      | 19971106         | DE19945004232      | 19941018         |
| EP0722397 A1       | 19960724         | EP19940930187      | 19941018         |
| EP0722397 B1       | 19971001         | EP19940930187      | 19941018         |
| JP9503465 T2       | 19970408         | JP19950511322T     | 19941018         |
| US5826952 A        | 19981027         | US19960632448      | 19960701         |
| WO9511147 A1       | 19950427         | WO1994EP03427      | 19941018         |

**Priority:**

DE19934335676 19931019 DE19945004232 19941018 WO1994EP03427 19941018

**Probable Assignee:** ITT AUTOMOTIVE EUROPE GMBH

**Assignee(s):** (std): FEIGEL HANS JOERG ; NEUMANN ULRICH ; SCHIEL LOTHAR ; TEVES GMBH ALFRED

**Assignee(s):** ITT AUTOMOTIVE EUROPE GMBH ; ITT AUTOMOTIVE EUROPE GMBH 60488 FRANKFURT DE

**Inventor(s):** (std): FEIGEL HANS JOERG ; FEIGEL HANS JOERG DIPL ING DR ; FEIGEL HANS JORG ; NEUMANN ULRICH ; NEUMANN ULRICH DIPL ING DR ; SCHIEL LOTHAR ; SCHIEL LOTHAR DIPL ING

**Inventor(s):** SCHIEL LOTHAR DIPL ING 65719 HOFHEIM DE ; SCHIEL LOTHAR D 65719 HOFHEIM DE ; NEUMANN ULRICH DIPL ING DR 64380 ROSDORF DE ; NEUMANN ULRICH D 64380 ROSDORF DE ; FEIGEL HANS JOERG DIPL ING DR 61191 ROSBACH DE ; FEIGEL HANS JOERG D 61191 ROSBACH DE

**Designated states:** AT BE CH DE DK ES FR GB GR IE IT JP LU MC NL PT SE US

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent        | Date recorded | Event group | Code  | Event                                                                   | Details                                                                      |
|---------------|---------------|-------------|-------|-------------------------------------------------------------------------|------------------------------------------------------------------------------|
| DE4335676 A1  | 19950420      | LSPB        | +     | published / reissued                                                    |                                                                              |
| DE4335676 A1  | 19950420      | LSES        | +OM8  | SEARCH REPORT AVAILABLE AS TO PARAGRAPH 43 LIT. 1 SENTENCE 1 PATENT LAW |                                                                              |
| DE4335676 A1  | 19981008      | LSES        | +8110 | REQUEST FOR EXAMINATION PARAGRAPH 44                                    |                                                                              |
| DE4335676 A1  | 20131019      | LSLE        | -R071 | EXPIRY OF RIGHT                                                         |                                                                              |
| DE59404232 D1 | 19981029      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                 |                                                                              |
| DE59404232 D1 | 20000427      | LSAS        | 8327  | CHANGE IN THE PERSON/NAME/ADDRESS OF THE PATENT OWNER                   | OWNER NAME : CONTINENTAL TEVES AG AND CO. OHG, 60488 FRANKFURT, D            |
| EP0722397 A1  | 19960724      | LSPB        | +     | published / reissued                                                    |                                                                              |
| EP0722397 A1  | 19960724      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                                           | EFFECTIVE DATE : 19960520                                                    |
| EP0722397 A1  | 19961218      | LSES        | +17Q  | FIRST EXAMINATION REPORT                                                | EFFECTIVE DATE : 19961030                                                    |
| EP0722397 A1  | 19980923      | LSGT        | +26N  | NO OPPOSITION FILED                                                     |                                                                              |
| EP0722397 A1  | 20000925      | LSFE        | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                          | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20000925<br>YEAR OF FEE PAYMENT : 07 |
| EP0722397 A1  | 20011018      | LSLE        | -PG25 | LAPSED IN A CONTRACTING STATE                                           | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE BECAUSE                         |

|              |          |      |       |                                                                                                      |                                                                                                                                                                                                                |
|--------------|----------|------|-------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO                                     | OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20011018                                                                                                                                                        |
| EP0722397 A1 | 20011018 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : FR<br>PAYMENT DATE : 20011018<br>YEAR OF FEE PAYMENT : 08                                                                                                                                   |
| EP0722397 A1 | 20020605 | LSLE | -GBPC | GB: EUROPEAN PATENT<br>CEASED THROUGH NON-<br>PAYMENT OF RENEWAL<br>FEE                              | EFFECTIVE DATE : 20011018                                                                                                                                                                                      |
| EP0722397 A1 | 20030630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING STATE<br>ANNOUNCED VIA<br>POSTGRANT INFORM.<br>FROM NAT. OFFICE TO<br>EPO | REF COUNTRY CODE : FR<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20030630                                                                                                |
| EP0722397 A1 | 20030815 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                      | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST                                                                                                                                                             |
| EP0722397 A1 | 20061031 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20061031<br>YEAR OF FEE PAYMENT : 13                                                                                                                                   |
| EP0722397 A1 | 20061031 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20061031<br>YEAR OF FEE PAYMENT : 13                                                                                                                                   |
| EP0722397 A1 | 20080131 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20071031<br>YEAR OF FEE PAYMENT : 14                                                                                                                                   |
| EP0722397 A1 | 20080131 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20071031<br>YEAR OF FEE PAYMENT : 14                                                                                                                                   |
| EP0722397 A1 | 20090130 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20081031<br>YEAR OF FEE PAYMENT : 15                                                                                                                                   |
| EP0722397 A1 | 20090130 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20081031<br>YEAR OF FEE PAYMENT : 15                                                                                                                                   |
| EP0722397 A1 | 20100129 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20091031<br>YEAR OF FEE PAYMENT : 16                                                                                                                                   |
| EP0722397 A1 | 20110228 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20101031<br>YEAR OF FEE PAYMENT : 17                                                                                                                                   |
| EP0722397 A1 | 20130131 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20121031<br>YEAR OF FEE PAYMENT : 19                                                                                                                                   |
| EP0722397 A1 | 20130131 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20121031<br>YEAR OF FEE PAYMENT : 19                                                                                                                                   |
| EP0722397 A1 | 20140131 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                 | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20131031<br>YEAR OF FEE PAYMENT : 20                                                                                                                                   |
| EP0722397 A1 | 20141021 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                      | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R071<br>REF DOCUMENT NUMBER :<br>59404232<br>COUNTRY OF REF DOCUMENT :<br>DE                                                                                   |
| EP0722397 B1 | 19971001 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                                              |                                                                                                                                                                                                                |
| EP0722397 B1 | 20141018 | PEXP |       | Calculated Patent Term<br>Expiry                                                                     |                                                                                                                                                                                                                |
| JP9503465 T2 | 19970408 | LSPB | +     | published / reissued                                                                                 |                                                                                                                                                                                                                |
| US5826952 A  | 19981027 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                                              |                                                                                                                                                                                                                |
| US5826952 A  | 19960701 | LSAS | AS    | ASSIGNMENT                                                                                           | OWNER NAME : ITT<br>AUTOMOTIVE EUROPE GMBH,<br>GERMANY<br>DESCRIPTION : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNORS:FEIGEL, HANS-<br>JORG; NEUMANN, ULRICH;<br>SCHIEL, LOTHAR;<br>REEL/FRAME:008139/0198 |

|              |          |      |       |                                                                         |                                                                  |
|--------------|----------|------|-------|-------------------------------------------------------------------------|------------------------------------------------------------------|
| US5826952 A  | 20021028 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                                                                  |
| US5826952 A  | 20021127 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                  |
| US5826952 A  | 20021224 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20021027                                        |
| US5826952 A  | 20160701 | PEXP |       | Calculated Patent Term Expiry                                           |                                                                  |
| WO9511147 A1 | 19950427 | LSPB | +     | published / reissued                                                    |                                                                  |
| WO9511147 A1 | 19960323 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                             | REF DOCUMENT NUMBER : 1994930187<br>COUNTRY OF REF DOCUMENT : EP |
| WO9511147 A1 | 19960701 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                             | REF DOCUMENT NUMBER : 08632448<br>COUNTRY OF REF DOCUMENT : US   |
| WO9511147 A1 | 19960724 | LSPB | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE                          | REF DOCUMENT NUMBER : 1994930187<br>COUNTRY OF REF DOCUMENT : EP |
| WO9511147 A1 | 19971001 | LSGT | +WWG  | WIPO INFORMATION: GRANT IN NATIONAL OFFICE                              | REF DOCUMENT NUMBER : 1994930187<br>COUNTRY OF REF DOCUMENT : EP |

**Title:** **CONTROL** DEVICE FOR WASTEWATER AND METHOD FOR **CONTROLLING** QUALITY PARAMETERS OF WASTEWATER

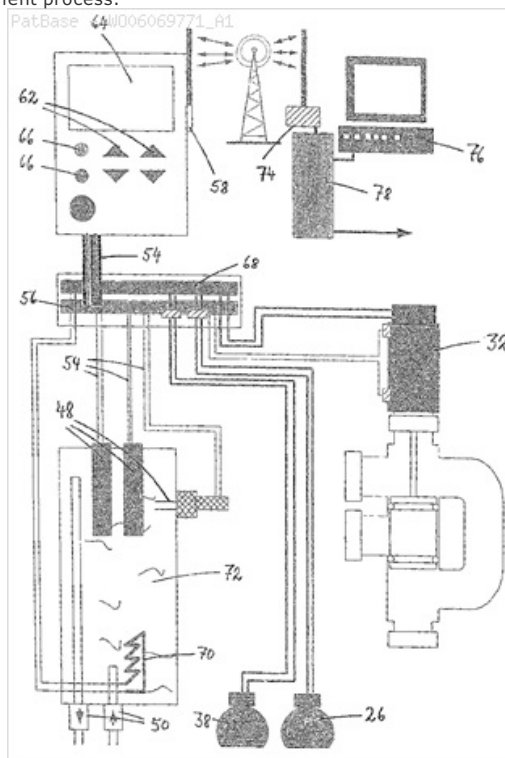
**Abstract:** The invention relates to a **control** device for wastewater. The inventive **control** device (52) is characterized by comprising at least one sensor (48), adapted to determine a quality parameter of the wastewater and transmit it as an **electronic** signal, and a transmission device (56) for transmitting determined, evaluated and/or stored sensor values of the sensor (48), thereby allowing to **control** the functioning of the treatment process.

**Classifications:**

**International (IPC 8-9):** C02F3/02 C02F3/12 (Advanced/Invention); C02F3/02 C02F3/12 (Core/Invention)

**CPC:** Y02W10/37 Y02W10/15 C02F3/006 C02F3/1242 C02F2209/008 C02F2209/06 C02F2209/07 C02F2209/11 C02F2209/22

**European:** C02F3/00R C02F3/12N2 M02F209/00T4 M02F209/06 M02F209/07 M02F209/11 M02F209/22



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE102004063720 A1  | 20060706         | DE200410063720     | 20041228         |
| WO06069771 A1      | 20060706         | WO2005EP14036      | 20051224         |

**Priority:**

DE200410063720 20041228

**Probable Assignee:** UWS UNITED WATER SYSTEMS GMBH

**Assignee(s):** (std): EBERLE PETER ; UWS UNITED WATER SYSTEMS GMBH

**Inventor(s):** (std): EBERLE PETER

**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LC LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SM SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

**Legal status (INPADOC)**

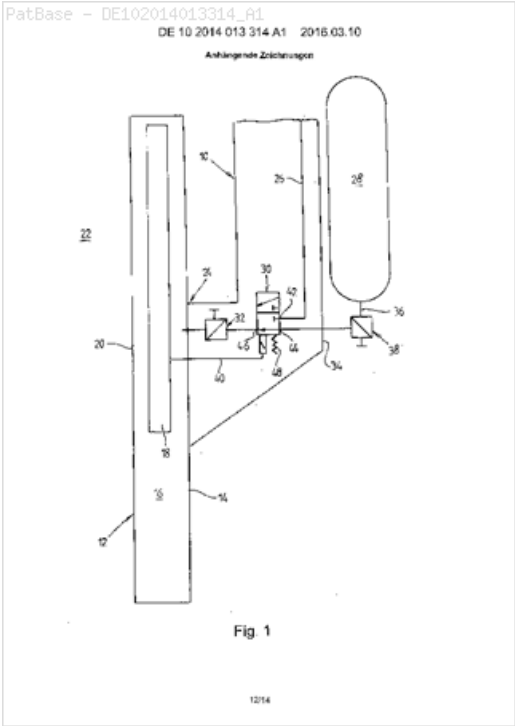
[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code  | Event                                                                   | Details                                                    |
|-------------------|---------------|-------------|-------|-------------------------------------------------------------------------|------------------------------------------------------------|
| DE102004063720 A1 | 20060706      | LSPB        | +     | published / reissued                                                    |                                                            |
| DE102004063720 A1 | 20060706      | LSES        | +OM8  | SEARCH REPORT AVAILABLE AS TO PARAGRAPH 43 LIT. 1 SENTENCE 1 PATENT LAW |                                                            |
| DE102004063720 A1 | 20091022      | LSLE        | -8139 | DISPOSAL/NON-PAYMENT OF THE ANNUAL FEE                                  |                                                            |
| WO06069771 A1     | 20060706      | LSPB        | +     | published / reissued                                                    |                                                            |
| WO06069771 A1     | 20080213      | LSWD        | -WWW  | WIPO INFORMATION: WITHDRAWN IN NATIONAL OFFICE                          | REF DOCUMENT NUMBER : 5821987 COUNTRY OF REF DOCUMENT : EP |

**Title:** VORRICHTUNG MIT ELEKTRISCHEN UND/ODER ELEKTRONISCHEN KOMPONENTEN IN EINEM GEKAPSELTEN GEHAEUSE FUEER EINEN BETRIEB IN EXPLOSIONSGEFAEHRDETEN UMGEBUNGEN SOWIE VERFAHREN DEVICE WITH ELECTRIC AND / OR **ELECTRONIC** COMPONENTS IN AN ENCAPSULATED **HOUSING** FOR A COMPANY IN EXPLOSIONSGEFAEHRDETEN ENVIRONMENTS AND METHOD (Machine translation)

**Abstract:** Source: DE102014013314A1 Die Erfindung betrifft eine Vorrichtung (12) mit einem gekapselten Gehaeuse (14) und elektrischen und/oder elektronischen Komponenten (18) in einem Innenraum (16) des Gehaeuses (14), sowie mit Zufuehreinrichtungen (26, 28, 30, 32) zur Zufuhr eines unter Druck stehenden Zuendschutzgases in den Innenraum (16) sowie ein Verfahren zum Betreiben einer solchen Vorrichtung (12). Um bei einer Unterbrechung der Stromzufuhr ein Eindringen von zuendfaehigem Gas in das Gehaeuse (14) zu verhindern, wird vorgeschlagen, dass die Zufuehreinrichtungen (26, 28, 30, 32) eine Zuendschutzgasversorgungsleitung (26) und einen separaten Zuendschutzgasspeicherbehaelter (28) sowie ein elektromagnetischen Zweiwegeventil (30) umfassen, das in bestromtem Zustand die Zuendschutzgasversorgungsleitung (26) und in unbestromtem Zustand den Zuendschutzgasspeicherbehaelter (28) mit dem Innenraum (16) verbindet. The invention relates to a device (12) having a sealed casing (14) and electrical and / or **electronic** components (18) in an interior (16) of the **housing** (14) and with supply means (26, 28, 30, 32) for supplying a pressurized protective gas into the interior (16) and a method for operating such a device (12). In order to prevent an interruption of the power supply penetration of ignitable gas in the **housing** (14), it is proposed that the supply means (26, 28, 30, 32) has a Zuendschutzgasversorgungsleitung (26) and a separate Zuendschutzgasspeicherbehaelter (28) and an electromagnetic **two-way valve** (30) which connects in the energized state, the Zuendschutzgasversorgungsleitung (26) and in the de-energized state of the Zuendschutzgasspeicherbehaelter (28) to the interior (16).

**Classifications:**  
**International (IPC 8-9):** H05K5/06 (Advanced/Invention)  
**CPC:** H05K5/06 H05K7/1462



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE102014013314 A1  | 20160310         | DE201410013314     | 20140908         |

**Priority:**

DE201410013314 20140908

**Probable Assignee:** CRE ROESLER ELECTRONIC GMBH  
**Assignee(s):** (std): CRE ROESLER ELECTRONIC GMBH  
**Inventor(s):** (std): ROESLER BERNHARD

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code | Event                | Details |
|-------------------|---------------|-------------|------|----------------------|---------|
| DE102014013314 A1 | 20160310      | LSPB        | +    | published / reissued |         |

**Title:** PRESSING APPARATUS FOR GLASS LAMINATES

**Abstract:** Source: GB784558A 784,558. Laminating - apparatus. PITTSBURGH PLATE GLASS CO. Sept. 30, 1955 [Dec. 22, 1954], No. 27869/55. Class 140. [Also in Group XXXVIII] An apparatus for pressing bent laminated assemblies such as two matched sheets of curved glass and a thermoplastic interlayer comprises a pair of spaced supporting members separately mounted for horizontal and vertical movement relative to a fixed **housing**, a roll **housing** rotatably mounted on the pair of supporting members and a pair of driven, yieldable opposing rolls on mountings for frictional engagement against opposite surfaces of the assemblies. A bent glass assembly with bent end upwards and the longitudinal axis parallel to the direction of travel, after passing through a furnace, is passed by a conveyer through two inflatable presser rolls 68, 69 rotatably mounted in plates 66, 67 supported by trunnions 57, 58 in bearings in supporting members 42, 43 in movable members having side and top members 17, 18 supported from hangers 30, 31 connected to pistons 26, 27 of cylinders 24, 25 for vertical movement over supports 20. Each supporting member 42, 43 is connected at the bottom to a cylinder 35 also connected to a movable member for horizontal movement by rollers 45 moving over guide tracks 40 on the movable members. The roll 69 is frictionally driven by a roll 77 driven by a motor 65. A further pair of rollers contact the roller. The upper roll 68 has three contacting rollers 93 one of which is driven from the lower roll 69 which also drives a sprocket 101 on a shaft 102 extending into a program **housing** 106. The shaft is connected by sprockets and chain to a sprocket 132 on a shaft 124 extending from trunnion 57. The sprocket is freely rotatable on the shaft and has integral one member 143 of a magnetic clutch, the other part 144 of which is secured to a sleeve connected to the trunnion 57. A cable 117 is wound on the sleeve and is connected to the piston 118 of a cylinder 120 which when operated rotates the rolls to the correct position to receive the glass assembly. The shaft 124 carries four program cams 148 and two other cams 149, 150. Cam followers 157 on levers 153 contact the cams and are connected to differential transformers 151. Two transformers are provided for vertical movement and two for horizontal movement of the rollers 68, 69. Each has a movable armature 155 connected to a lever 153. Cam 149 actuates the air cylinder 120 by a switch 160. Cam 150 engages a switch 161 to disengage the magnetic clutch. A trip starting mechanism comprises a plate 208 supported from a shaft 210 mounted on upright members 14 and having at one end a dog 221 engageable with a dog 222 on a stub shaft 217 having an arm 219 which rests on a switch 220. When shaft 210 is rotated by the feed of the glass assembly the arm is lifted from the switch to actuate a timer for glass alignment assembly 260, air cylinder 120 and magnetic clutch 143, 144 as well as the motor 65 if desired. A solenoid-operated latch 228, 229 is also provided to prevent oscillation of plate 208 one part being mounted on shaft 210. Secured to hanger 30 is a cable 204 passing over pulley 185 on member 13. The shaft of the pulley has a cam 184 in contact with a follower pin 189 on a needle 190 connected to the armature of feed-back differential transformer 198. Cable 204 is connected to a weight 205 moving within a container 206. Movement of the armature returns the rolls to their original position after vertical movement. Similarly the original position is restored after horizontal movement by rotation of a cam 168 operating a feed-back differential transformer on a movable frame. A feed in conveyer for the glass assembly comprises rollers 231 supported by a pair of driven chains. A glass aligning mounting plate is bolted to a side rail 246, a piston-rod extends through the plate to an alignment bar 272 the movement of which by the piston is limited by nuts and sleeves on two guide bars. A discharge conveyer 280 is similar without the alignment device. Attached to opposite supports 14 are two containers for **control** assemblies having a servo **valve** and an **electronic** amplifier. Fig. 10 shows one circuit for vertical movement and **control** of one end frame. Feed-back differential transformer 198 and program differential transformer 151 are connected in voltage opposition. A servomotor 289 has a differential transformer 290 which has two primary coils P connected in series, two secondary coils S1, S2 connected in opposition and an armature. Primary coils are connected to 64 output of transformer 293. Potentiometer 295 is connected to the primary coil of transformer 290 to vary the sensitivity of the servomotor. Secondary coils are connected to the input 296 of amplifier 294. The output is connected to a reversible two-phase servomotor 298. Motor 298 and transformer 293 are connected to 110 v. A.C. source. Armature 155 is moved by cam follower 157 contacting cam 148. Armature 197 is moved by cam follower 189 on cam 184. Cylinder 24 for **controlling** vertical movement of movable members 17, 18 has oil supply lines 300, 301 connected to a four-way **valve** 302. Piston 306 of the **valve** is connected to eccentric 308 on a shaft rotated by motor 298, the piston is also connected to the armature 314 of transformer 290. The circuit is operated by the glass assembly contacting the trip starter 208 when cams 148 rotate on shaft 124 to move armature 155 and cause unbalance in the circuits, whereby the ends of the rollers are caused to move in predetermined manner to anticipate the twist of the glass along its longitudinal axis. The profiles of the cams are predetermined according to the shape of the glass assembly to be pressed.

**Classifications:**

**International (IPC 8-9):** B32B17/10 (Advanced/Invention); B32B17/06 (Core/Invention)

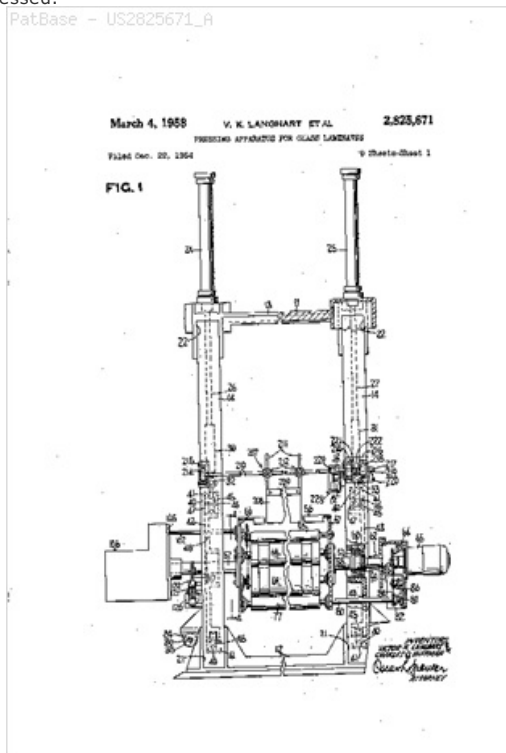
**International (IPC 1-7):** B29C3/00 B32B17/10

**CPC:** B32B17/10036 B32B17/10862

**European:** B32B17/10L10B4

**US:** 100/155G 100/161 100/170 100/173 100/49 72/13.4

PatBase - US2825671\_A

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| BE542710 A         | 00000000         |                    | 00000000         |
| CH333126 A         | 19581015         |                    | 19551118         |
| ES224937 A1        | 19560116         | ES19550224937      | 19551110         |

|             |          |               |          |
|-------------|----------|---------------|----------|
| FR1138895 A | 19570620 |               | 19551104 |
| GB784558 A  | 19571009 | GB19550027869 | 19550930 |
| US2825671 A | 19580304 | US19540476978 | 19541222 |

**Priority:**

US19540476978 19541222

**Probable Assignee:** PITTSBURGH PLATE GLASS CO

**Assignee(s):** (std): PITTSBURGH PLATE GLASS CO

**Assignee(s):** PITTSBURGH PLATE GLASS COMPANY

**Inventor(s):** (std): VICTOR KILIAN LANGHART ; LANGHART VICTOR K ; HUFFMAN CHARLES O ; CHARLES OWEN HUFFMAN

**Inventor(s):** KILIAN LANGHART VICTOR ; OWEN HUFFMAN CHARLES

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent      | Date recorded | Event group | Code | Event                                | Details |
|-------------|---------------|-------------|------|--------------------------------------|---------|
| BE542710 A  | 00000000      | LSPB        | +    | published / reissued                 |         |
| BE542710 A  | 19200101      | PEXP        |      | Calculated Patent Term Expiry        |         |
| CH333126 A  | 19581015      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| CH333126 A  | 19751118      | PEXP        |      | Calculated Patent Term Expiry        |         |
| ES224937 A1 | 19560116      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| FR1138895 A | 19570620      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| FR1138895 A | 19751104      | PEXP        |      | Calculated Patent Term Expiry        |         |
| GB784558 A  | 19571009      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| GB784558 A  | 19750930      | PEXP        |      | Calculated Patent Term Expiry        |         |
| US2825671 A | 19580304      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |

**Title:** Method and apparatus for obtaining fluid samples in a well

**Abstract:** Source: US4583595A A method and an apparatus for taking a sample representative of the fluid present in a well comprises an elongated body, suitable for being suspended down the well at the end of a cable. The body includes a removable sampling vessel fixed sideways in a recessed portion of the body which vessel is capable of being used, after being filled downhole, as a vessel for transporting the sample under pressure.

**Classifications:**

**International (IPC 8-9):** E21B49/08 G01N1/10 G01N1/12 G01N1/14 (Advanced/Invention);

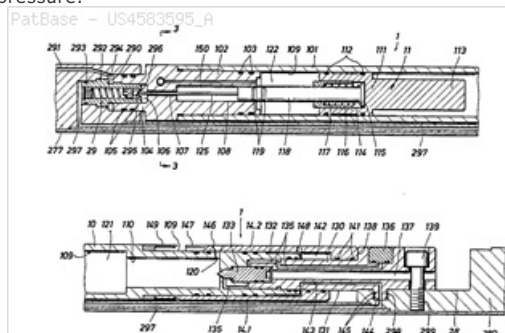
E21B49/00 G01N1/12 G01N1/14 (Core/Invention)

**International (IPC 1-7):** E21B49/08 G01N1/10 G01N1/12 G01N1/14

**CPC:** E21B49/082 G01N1/12 G01N1/14

**European:** E21B49/08B2 G01N1/12 G01N1/14

**US:** 166/264 175/233 175/59



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU198437076 A1     | 19850704         | AU19840037076      | 19841221         |
| AU572616 B2        | 19880512         | AU19840037076      | 19841221         |
| CA1225850 A1       | 19870825         | CA19840470830      | 19841221         |
| DE3473903 D1       | 19881013         | DE19843473903      | 19841221         |
| DK623184 A         | 19850623         | DK19840006231      | 19841221         |
| DK623184 A0        | 19841221         | DK19840006231      | 19841221         |
| EP0148696 A1       | 19850717         | EP19840402691      | 19841221         |
| EP0148696 B1       | 19880907         | EP19840402691      | 19841221         |
| FR2558522 A1       | 19850726         | FR19830020604      | 19831222         |
| FR2558522 B1       | 19860502         | FR19830020604      | 19831222         |
| OA7908 A           | 19861120         | OA19840058485      | 19841221         |
| US4583595 A        | 19860422         | US19840684422      | 19841220         |

**Priority:**

CA19840470830 19841221 FR19830020604 19831222

**Probable Assignee:** SCHLUMBERGER CA LTD

**Assignee(s):** (std): SCHLUMBERGER CA LTD ; SCHLUMBERGER LTD ; SCHLUMBERGER TECHNOLOGY CORP ; SCHLUMBERGER PROSPECTION ; SCHLUMBERGER TECHNOLOGY BV

**Assignee(s):** CHEVASSUS MORE ALAIN R ; CZERNICHOW JEAN A ; DE PROSPECTION ELECTRIQUE SCHLUMBERGER SOC ; SCHLUMBERGER PROSPECTION ELECTR ; SCHLUMBERGER TECHNOLOGY B V ; SOCIETE DE PROSPECTION ELECTRIQUE SCHLUMBERGER ; SCHLUMBERGER CANADA LIMITED ; SCHLUMBERGER CANADA LTD ; SCHLUMBERGER LIMITED

**Inventor(s):** (std): ARNOLD CZERNICHOW JEAN ; CHEVASSUS MORE ALAIN ; CHEVASSUS MORE ALAIN R ; CHEVASSUS MORE ALAIN ROBERT ; CZERNICHOW JEAN ; CZERNICHOW JEAN A ; CZERNICHOW JEAN ARNOLD ; ROBERT CHEVASSUS MORE ALAIN

**Inventor(s):** ALAIN CHEVASSUS MORE ; ALAIN ROBERT CHEVASSUS MORE ET JEAN ARNOLD CZERNIC ; ALAIN ROBERT CHEVASSUS MORE ET JEAN ARNOLD... ; JEAN CZERNICHOW

**Agent(s):** GRIFFITH HACK; SMART AND BIGGAR

**Designated states:** DE FR GB IT NL

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                   | Details                   |
|--------------|---------------|-------------|-------|-----------------------------------------|---------------------------|
| CA1225850 A1 | 20041221      | LSLE        | -MKEX | EXPIRY                                  |                           |
| DE3473903 D1 | 19891005      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION |                           |
| DE3473903 D1 | 19891207      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE    |                           |
| DK623184 A   | 19850623      | LSPB        | +     | published / reissued                    |                           |
| DK623184 A   | 19890814      | LSWD        | -AHB  | APPLICATION SHELVED DUE TO NON-PAYMENT  |                           |
| EP0148696 A1 | 19850717      | LSPB        | +     | published / reissued                    |                           |
| EP0148696 A1 | 19860219      | LSSES       | +17P  | REQUEST FOR EXAMINATION FILED           | EFFECTIVE DATE : 19851212 |
| EP0148696 A1 | 19861230      | LSSES       | +17Q  | FIRST EXAMINATION REPORT                | EFFECTIVE DATE : 19861106 |

|              |          |       |       |                                                                                                          |                                                                                                                                                                                                                                                          |
|--------------|----------|-------|-------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP0148696 A1 | 19870520 | LSSES | D17Q  | FIRST EXAMINATION REPORT (DELETED)                                                                       |                                                                                                                                                                                                                                                          |
| EP0148696 A1 | 19880907 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : IT<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 19880907                                                               |
| EP0148696 A1 | 19880907 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : NL<br>EFFECTIVE DATE : 19880907                                                                                                                                                                                                       |
| EP0148696 A1 | 19890216 | LSLE  | -NLV1 | NL: LAPSED OR ANNULLED DUE TO FAILURE TO FULFILL THE REQUIREMENTS OF ART. 29P AND 29M OF THE PATENTS ACT |                                                                                                                                                                                                                                                          |
| EP0148696 A1 | 19890830 | LSGT  | +26N  | NO OPPOSITION FILED                                                                                      |                                                                                                                                                                                                                                                          |
| EP0148696 A1 | 19890901 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : DE<br>EFFECTIVE DATE : 19890901                                                                                                                                                                                                       |
| EP0148696 A1 | 19910923 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : GB<br>PAYMENT DATE : 19910923<br>YEAR OF FEE PAYMENT : 08                                                                                                                                                                             |
| EP0148696 A1 | 19921221 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : GB<br>EFFECTIVE DATE : 19921221                                                                                                                                                                                                       |
| EP0148696 A1 | 19930818 | LSLE  | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                                            | EFFECTIVE DATE : 19921221                                                                                                                                                                                                                                |
| EP0148696 A1 | 19941025 | LSFE  | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                                           | REF COUNTRY CODE : FR<br>PAYMENT DATE : 19941025<br>YEAR OF FEE PAYMENT : 11                                                                                                                                                                             |
| EP0148696 A1 | 19960830 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO                    | REF COUNTRY CODE : FR<br>EFFECTIVE DATE : 19960830                                                                                                                                                                                                       |
| EP0148696 A1 | 19961031 | LSLE  | REG   | REFERENCE TO A NATIONAL CODE                                                                             | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST                                                                                                                                                                                                       |
| EP0148696 B1 | 19880907 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                                     |                                                                                                                                                                                                                                                          |
| FR2558522 A1 | 19850726 | LSPB  | +     | published / reissued                                                                                     |                                                                                                                                                                                                                                                          |
| FR2558522 A1 | 19901026 | LSLE  | -ST   | NOTIFICATION OF LAPSE                                                                                    |                                                                                                                                                                                                                                                          |
| FR2558522 B1 | 19860502 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                                     |                                                                                                                                                                                                                                                          |
| FR2558522 B1 | 20031222 | PEXP  |       | Calculated Patent Term Expiry                                                                            |                                                                                                                                                                                                                                                          |
| OA7908 A     | 19861120 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                                     |                                                                                                                                                                                                                                                          |
| OA7908 A     | 20041221 | PEXP  |       | Calculated Patent Term Expiry                                                                            |                                                                                                                                                                                                                                                          |
| US4583595 A  | 19860422 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                                     |                                                                                                                                                                                                                                                          |
| US4583595 A  | 19850513 | LSAS  | AS    | ASSIGNMENT                                                                                               | OWNER NAME : SCHLUMBERGER TECHNOLOGY CORPORATION, 5000 GULF FRE<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.;<br>ASSIGNORS:CZERNICHOW, JEAN A.;<br>CHEVASSUS-MORE, ALAIN R.;<br>REEL/FRAME:004398/0548;<br>SIGNING DATES FROM 19850115 TO 19850121 |
| US4583595 A  | 19860219 | LSGT  | PAT1  | Patented Case                                                                                            |                                                                                                                                                                                                                                                          |

|             |          |      |       |                                               |                           |
|-------------|----------|------|-------|-----------------------------------------------|---------------------------|
| US4583595 A | 19891023 | LSFE | +FPAY | FEE PAYMENT                                   | YEAR OF FEE PAYMENT : 4   |
| US4583595 A | 19931001 | LSFE | +FPAY | FEE PAYMENT                                   | YEAR OF FEE PAYMENT : 8   |
| US4583595 A | 19980419 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES     |                           |
| US4583595 A | 19980630 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE | EFFECTIVE DATE : 19980422 |

**Title:** BRAKE SYSTEM FOR MOTOR VEHICLES

**Abstract:** Source: US2008258545A A brake system for motor vehicles has a master cylinder (1) to which wheel brake cylinders are connectable, a first piston (2) which is coupled to a brake pedal (3) by way of a push rod (28) that transmits actuating forces, a second piston (4) used to actuate the master cylinder (1), a third piston (5) which can be actuated by the first piston (2) and can be moved into a force-transmitting connection with the second piston (4), a pedal travel simulator, a coupling element between the first and the third pistons, which is activated depending on the displacement travel of the third piston (5), with a space (11) between the second (4) and the third pistons (5) with the pressurization of the space (11) loading the second and third pistons (4, 5) in opposite directions, as well as with a pressure-supplying module (13), which enables both filling of the space (11) with pressure fluid as well as its evacuation.

**Classifications:**

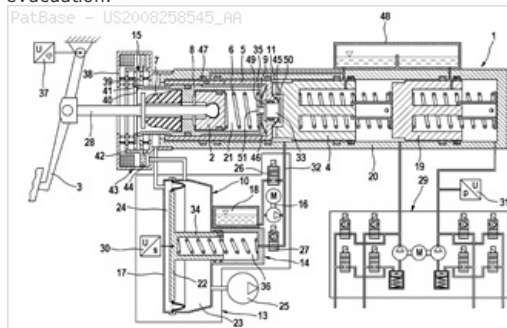
**International (IPC 8-9):** B60T11/16 B60T13/52 B60T13/57 B60T13/60 B60T13/68 B60T13/70 B60T7/06 B60T8/40 B60T8/44 (Advanced/Invention);

B60T8/40 (Advanced/Non-invention); B60T8/40 B60T8/44 (Core/Invention)

**CPC:** B60T8/3275 B60T8/4018 B60T8/4077

**European:** B60T8/32D14D B60T8/40C B60T8/40J2

**US:** 303/114.1 303/114.100P



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN101039830 A      | 20070919         | CN200580034665     | 20051013         |
| DE102005036638 A1  | 20060427         | DE200510036638     | 20050804         |
| DE502005008719 D1  | 20100128         | DE200550008719T    | 20051013         |
| EP1802503 A1       | 20070704         | EP20050797003      | 20051013         |
| EP1802503 B1       | 20091216         | EP20050797003      | 20051013         |
| JP2008516830 T2    | 20080522         | JP20070536182T     | 20051013         |
| KR20070062999 A    | 20070618         | KR20077008416      | 20070413         |
| US2008258545 AA    | 20081023         | US20050664635      | 20051013         |
| WO06042822 A1      | 20060427         | WO2005EP55244      | 20051013         |

**Priority:**

DE200410050112 20041015 DE200510036638 20050804 WO2005EP55244 20051013

**Probable Assignee:** CONTINENTAL TEVES AG AND CO OHG

**Assignee(s):** (std): CONTINENTAL AG ; CONTINENTAL TEVES AG AND CO OHG ; CONTINENTAL TEVES AND CO OHG AG ; DRUMM STEFAN

**Assignee(s):** CONTINENTAL TEVES AND COOHG AG

**Inventor(s):** (std): STEFAN DRUMM ; DRUMM STEFAN

**Agent(s):** CONTINENTAL TEVES INC

**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KM KP KR KZ LC LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SM SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code  | Event                                                                       | Details |
|-------------------|---------------|-------------|-------|-----------------------------------------------------------------------------|---------|
| CN101039830 A     | 20070919      | LSPB        | +     | published / reissued                                                        |         |
| CN101039830 A     | 20070919      | LSPB        | +C06  | PUBLICATION                                                                 |         |
| CN101039830 A     | 20090826      | LSDW        | -C02  | DEEMED WITHDRAWAL OF PATENT APPLICATION AFTER PUBLICATION (PATENT LAW 2001) |         |
| DE102005036638 A1 | 20060427      | LSPB        | +     | published / reissued                                                        |         |
| DE102005036638 A1 | 20060427      | LSES        | OR8   | REQUEST FOR SEARCH AS TO PARAGRAPH 43 LIT. 1 SENTENCE 1 PATENT LAW          |         |
| DE102005036638 A1 | 20060928      | LSES        | +8105 | SEARCH REPORT AVAILABLE                                                     |         |
| DE102005036638 A1 | 20120817      | LSWD        | -R120 | APPLICATION WITHDRAWN OR IP RIGHT ABANDONED                                 |         |

|                   |          |      |       |                                                                                                         |                                                                                                                                                                                                                          |
|-------------------|----------|------|-------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DE102005036638 A1 | 20121011 | LSWD | -R120 | APPLICATION<br>WITHDRAWN OR<br>IP RIGHT<br>ABANDONED                                                    | EFFECTIVE DATE : 20120817                                                                                                                                                                                                |
| DE502005008719 D1 | 20110105 | LSGT | +8364 | NO OPPOSITION<br>DURING TERM OF<br>OPPOSITION                                                           |                                                                                                                                                                                                                          |
| EP1802503 A1      | 20070704 | LSPB | +     | published /<br>reissued                                                                                 |                                                                                                                                                                                                                          |
| EP1802503 A1      | 20070704 | LSES | +17P  | REQUEST FOR<br>EXAMINATION<br>FILED                                                                     | EFFECTIVE DATE : 20070515                                                                                                                                                                                                |
| EP1802503 A1      | 20071017 | LSES | +17Q  | FIRST<br>EXAMINATION<br>REPORT                                                                          | EFFECTIVE DATE : 20070917                                                                                                                                                                                                |
| EP1802503 A1      | 20100730 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>ES<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO PAY<br>THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20100327 |
| EP1802503 A1      | 20100831 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>CZ<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO PAY<br>THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20091216 |
| EP1802503 A1      | 20101124 | LSGT | +26N  | NO OPPOSITION<br>FILED                                                                                  | EFFECTIVE DATE : 20100917                                                                                                                                                                                                |
| EP1802503 A1      | 20110729 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>FR<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF NON-PAYMENT OF<br>DUE FEES<br>LAPSED DATE : 20101102                                                                                        |
| EP1802503 A1      | 20110729 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                         | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST<br>EFFECTIVE DATE : 20110630                                                                                                                                          |
| EP1802503 A1      | 20120928 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>HU<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO<br>SUBMIT A TRANSLATION OF<br>THE DESCRIPTION OR TO PAY<br>THE FEE WITHIN THE<br>PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20100617 |
| EP1802503 A1      | 20170131 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES PAID<br>TO NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT :<br>DE<br>PAYMENT DATE : 20161031<br>YEAR OF FEE PAYMENT : 12                                                                                                                                   |
| EP1802503 B1      | 20091216 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                              |                                                                                                                                                                                                                          |
| EP1802503 B1      | 20251013 | PEXP |       | Calculated Patent<br>Term Expiry                                                                        |                                                                                                                                                                                                                          |
| JP2008516830 T2   | 20080522 | LSPB | +     | published /<br>reissued                                                                                 |                                                                                                                                                                                                                          |
| JP2008516830 T2   | 20100203 | LSWD | -A761 | WRITTEN<br>WITHDRAWAL OF<br>APPLICATION                                                                 | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A761<br>EFFECTIVE DATE : 20100202                                                                                                                                           |
| JP2008516830 T2   | 20100203 | LSWD | -A761 | WRITTEN<br>WITHDRAWAL OF<br>APPLICATION                                                                 | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A761<br>EFFECTIVE DATE : 20100202                                                                                                                                           |
| KR20070062999 A   | 20070618 | LSPB | +     | published /<br>reissued                                                                                 |                                                                                                                                                                                                                          |
| KR20070062999 A   | 20101114 | LSDW | -WITN | WITHDRAWAL DUE<br>TO NO REQUEST<br>FOR<br>EXAMINATION                                                   |                                                                                                                                                                                                                          |
| US2008258545 AA   | 20081023 | LSPB | +     | published /<br>reissued                                                                                 |                                                                                                                                                                                                                          |
| US2008258545 AA   | 20110610 | LSWD | -ABD2 | Abandoned --<br>Failure to Pay                                                                          |                                                                                                                                                                                                                          |

| Issue Fee     |          |      |      |                                                         |                                                                            |
|---------------|----------|------|------|---------------------------------------------------------|----------------------------------------------------------------------------|
| WO06042822 A1 | 20060427 | LSPB | +    | published /<br>reissued                                 |                                                                            |
| WO06042822 A1 | 20070411 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE    | REF DOCUMENT NUMBER :<br>200580034665.3<br>COUNTRY OF REF DOCUMENT :<br>CN |
| WO06042822 A1 | 20070411 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE    | REF DOCUMENT NUMBER :<br>2007536182<br>COUNTRY OF REF DOCUMENT :<br>JP     |
| WO06042822 A1 | 20070418 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE    | REF DOCUMENT NUMBER :<br>2005797003<br>COUNTRY OF REF DOCUMENT :<br>EP     |
| WO06042822 A1 | 20070704 | LSPB | +WWP | WIPO<br>INFORMATION:<br>PUBLISHED IN<br>NATIONAL OFFICE | REF DOCUMENT NUMBER :<br>2005797003<br>COUNTRY OF REF DOCUMENT :<br>EP     |
| WO06042822 A1 | 20080228 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE    | REF DOCUMENT NUMBER :<br>11664635<br>COUNTRY OF REF DOCUMENT :<br>US       |

**Title:** ASSEMBLY FOR THE AUTOMATIC CLEANING OF COMPUTER KEYBOARDS

**Abstract:** The system for the automatic cleaning of computer keyboards has a cleaning section (2) with a mechanical holding device (3) in which the keyboards can be laid. The holders are arranged so that the surface of the keyboard elements lie in the working area of a cleaning head (4) which has brush arrangements (21), sensing sub-assemblies for the scanning of the key contours for a variable adjustment of working positions of the cleaning head, spraying devices (11) for the application of liquids for the brush cleaning and disinfecting purposes, and adjustable air blast devices to direct air flow to the key surfaces and for drying purposes.

**Classifications:**

**International (IPC 8-9):** B08B1/04 B08B15/00 B08B3/02 B08B5/02

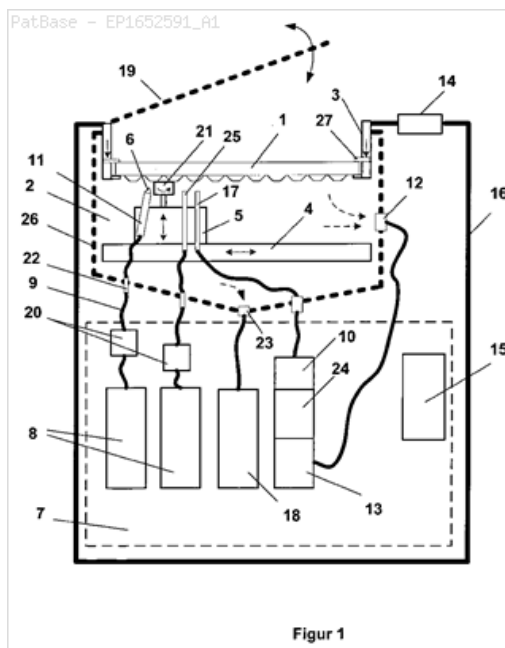
G06F1/16 G06F3/033 (Advanced/Invention);

B08B1/04 B08B15/00 B08B3/02 B08B5/02 G06F1/16

G06F3/033 (Core/Invention)

**CPC:** B08B1/04 B08B3/006 B08B3/024 B08B5/02 G06F3/0202

**European:** B08B1/04 B08B3/00M B08B3/02C B08B5/02 G06F3/02A



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE102004052844 A1  | 20060504         | DE200410052844     | 20041102         |
| EP1652591 A1       | 20060503         | EP20050000304      | 20050108         |

**Priority:**

DE200410052844 20041102

**Probable Assignee:** WESTHAEUSLER JUERGEN

**Assignee(s):** (std): WESTHAEUSLER JUERGEN ; WESTHAEUSLER JUERGEN DR

**Inventor(s):** (std): WESTHAEUSLER JUERGEN DR ; WESTHAEUSLER JUERGEN

**Designated states:** AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code  | Event                                             | Details                                                                                                         |
|-------------------|---------------|-------------|-------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| DE102004052844 A1 | 20060504      | LSPB        | +     | published / reissued                              |                                                                                                                 |
| DE102004052844 A1 | 20060608      | LSLI        | 8122  | NONBINDING INTEREST IN GRANTING LICENCES DECLARED |                                                                                                                 |
| DE102004052844 A1 | 20100916      | LSLE        | -8139 | DISPOSAL/NON-PAYMENT OF THE ANNUAL FEE            |                                                                                                                 |
| EP1652591 A1      | 20060503      | LSPB        | +     | published / reissued                              |                                                                                                                 |
| EP1652591 A1      | 20061129      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                     | EFFECTIVE DATE : 20061017                                                                                       |
| EP1652591 A1      | 20070110      | LSFE        | +AKX  | PAYMENT OF DESIGNATION FEES                       | DESIGNATED STATE(S) : AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR |
| EP1652591 A1      | 20100421      | LSDW        | -18D  | DEEMED TO BE WITHDRAWN                            | EFFECTIVE DATE : 20080801                                                                                       |

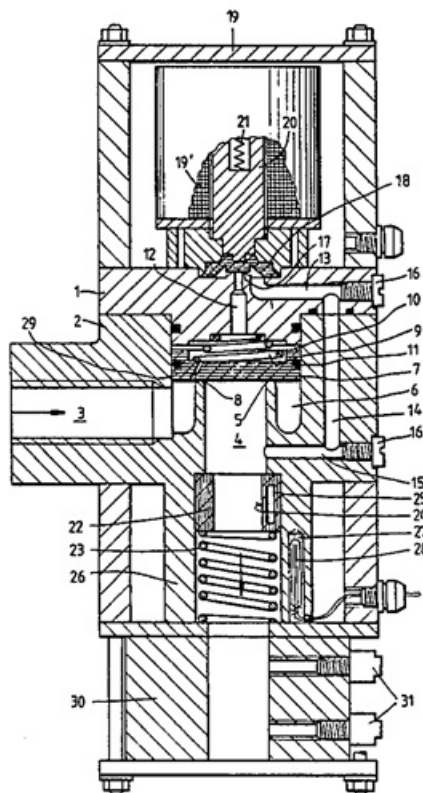
**Title:** ELECTROMAGNETICALLY **CONTROLLABLE** SPRAY **VALVE** AND SPRAY SYSTEM

**Abstract:** Source: US4557420A The spray **valve** comprises a cylindrical component having a central passage, which body is slidably disposed in a widened portion of the **valve** body. The cross-sectional area of the central passage is smaller than that of the widened portion, so that the cylindrical component is displaced outwardly against the return force of a spring by the flow occurring when the spray **valve** is opened. A permanent magnet is embedded in the wall of the cylindrical component. In the wall of the **valve** body surrounding the widened portion thereof there is a blind bore in which a reed contact is inserted. Through the flow of liquid occurring when the spray **valve** is opened, the magnet is displaced into the field of response of the reed contact, which thus indicates the opening of the spray **valve**. This spray **valve** is intended to be utilized in a system for spraying a thawing agent. A plurality of **control** circuits are disposed along a roadway, one of the spray **valves** being associated with each **control** circuit. The reed contacts make possible a remote indication of the operating readiness of the individual spray **valves**, making the spraying system much more reliable.

**Classifications:**

**International (IPC 8-9):** A01G25/02 B05B1/02 B05B12/04 B05B15/00 E01H10/00 F16K27/00 F16K37/00 F16K51/00 G01F1/28 G01F15/075 (Advanced/Invention);  
**International (IPC 1-7):** A01G25/02 B05B1/02 B05B12/04 B05B15/00 E01H10/00 F16K27/00 F16K37/00 G01F1/20 G01F15/00 (Core/Invention)  
**CPC:** A62C37/10 B05B15/00 E01H10/005 F16K37/0033 F16K37/0041  
**European:** A62C37/04 B05B15/00 E01H10/00C F16K37/00D2  
**US:** 239/172 239/66 239/74

PatBase - US4557420\_R



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CA1205721 A1       | 19860610         | CA19830436101      | 19830906         |
| CH658411 A         | 19861114         | CH19820005395      | 19820910         |
| DE3369190 D1       | 19870219         | DE19833369190      | 19830902         |
| EP0106796 A2       | 19840425         | EP19830810403      | 19830902         |
| EP0106796 A3       | 19840725         | EP19830810403      | 19830902         |
| EP0106796 B1       | 19870114         | EP19830810403      | 19830902         |
| JP59073070 A2      | 19840425         | JP19830166441      | 19830909         |
| US4557420 A        | 19851210         | US19830529164      | 19830902         |

**Priority:**

CA19830436101 19830906 CH19820005395 19820910

**Probable Assignee:** BOSCHUNG MECATRONIC AG

**Assignee(s):** (std): BOSCHUNG MECATRONIC AG ; BOSHUYUNKU MEKATORONITSUKU AG

**Assignee(s):** ZEHNDER WALTER ; BOSCHUNG MARCEL

**Inventor(s):** (std): BOSCHUNG MARCEL ; MARUSERU BOSHUYUNKU ; UORUTAA TSUENDAA ; ZEHNDER WALTER

**Agent(s):** ROBIC ROBIC AND ASSOCIES ASSOCIATES

**Designated states:** DE FR GB SE

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                | Details |
|--------------|---------------|-------------|-------|--------------------------------------|---------|
| CA1205721 A1 | 20030906      | LSLE        | -MKEX | EXPIRY                               |         |
| CH658411 A   | 19861114      | LSGT        | +     | granted / extensions (spc, cpc, pte) |         |
| CH658411 A   | 19930528      | LSLE        | -PL   | PATENT CEASED                        |         |

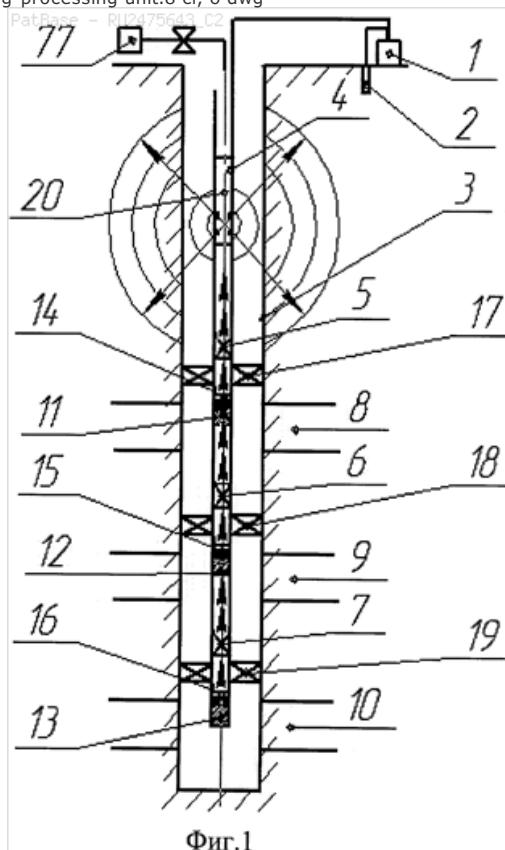
|               |          |      |       |                                                                                       |                                                                                                                                                                                                                            |
|---------------|----------|------|-------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CH658411 A    | 20020910 | PEXP |       | Calculated Patent Term Expiry                                                         |                                                                                                                                                                                                                            |
| DE3369190 D1  | 19880204 | LSGT | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                               |                                                                                                                                                                                                                            |
| DE3369190 D1  | 19930909 | LSLE | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                                  |                                                                                                                                                                                                                            |
| EP0106796 A2  | 19840425 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                                                            |
| EP0106796 A2  | 19841031 | LSES | +17P  | REQUEST FOR EXAMINATION FILED                                                         | EFFECTIVE DATE : 19840825                                                                                                                                                                                                  |
| EP0106796 A2  | 19871223 | LSGT | +26N  | NO OPPOSITION FILED                                                                   |                                                                                                                                                                                                                            |
| EP0106796 A2  | 19900717 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : SE<br>PAYMENT DATE : 19900717<br>YEAR OF FEE PAYMENT : 08                                                                                                                                               |
| EP0106796 A2  | 19900806 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : FR<br>PAYMENT DATE : 19900806<br>YEAR OF FEE PAYMENT : 08                                                                                                                                               |
| EP0106796 A2  | 19900810 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : GB<br>PAYMENT DATE : 19900810<br>YEAR OF FEE PAYMENT : 08                                                                                                                                               |
| EP0106796 A2  | 19910902 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : GB<br>EFFECTIVE DATE : 19910902                                                                                                                                                                         |
| EP0106796 A2  | 19910903 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : SE<br>EFFECTIVE DATE : 19910903                                                                                                                                                                         |
| EP0106796 A2  | 19910930 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : DE<br>PAYMENT DATE : 19910930<br>YEAR OF FEE PAYMENT : 09                                                                                                                                               |
| EP0106796 A2  | 19920429 | LSLE | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                         |                                                                                                                                                                                                                            |
| EP0106796 A2  | 19920529 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : FR<br>EFFECTIVE DATE : 19920529                                                                                                                                                                         |
| EP0106796 A2  | 19920731 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST                                                                                                                                                                         |
| EP0106796 A2  | 19930602 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : DE<br>EFFECTIVE DATE : 19930602                                                                                                                                                                         |
| EP0106796 A2  | 19950131 | LSLE | -EUG  | SE: EUROPEAN PATENT HAS LAPSED                                                        | REF DOCUMENT NUMBER : 83810403.2<br>EFFECTIVE DATE : 19920408<br>FORMAT OF REF DOCUMENT (F/P) : F                                                                                                                          |
| EP0106796 B1  | 19870114 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                                            |
| JP59073070 A2 | 19840425 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                                                            |
| US4557420 A   | 19851210 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                                            |
| US4557420 A   | 19850906 | LSAS | AS    | ASSIGNMENT                                                                            | OWNER NAME : BOSCHUNG MECATRONIC AG, RIED, 3185 SCHMITTEN (SWIT<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.;<br>ASSIGNORS:BOSCHUNG, MARCEL; ZEHNDER, WALTER;<br>REEL/FRAME:004450/0001<br>EFFECTIVE DATE : 19830825 |
| US4557420 A   | 19851008 | LSGT | PAT1  | Patented Case                                                                         |                                                                                                                                                                                                                            |
| US4557420 A   | 19890612 | LSFE | +FPAY | FEE PAYMENT                                                                           | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                    |
| US4557420 A   | 19931212 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                                             |                                                                                                                                                                                                                            |

|             |          |      |     |                                                     |                           |
|-------------|----------|------|-----|-----------------------------------------------------|---------------------------|
| US4557420 A | 19940222 | LSLE | -FP | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE | EFFECTIVE DATE : 19931212 |
|-------------|----------|------|-----|-----------------------------------------------------|---------------------------|

**Abstract:** Source: RU2010154792A FIELD: oil and gas industry.SUBSTANCE: method involves lowering of packers and equipment for extraction (pumping) of product in interval of product extraction on tubing string located against each productive formation. Down-hole measurements are performed by sensors. Obtained data is transmitted to ground receiving-processing unit by means of **electronic** self-powered measurement modules transmitting data signals by tubing string by electromagnetic pulses to common **electronic** self-powered transmitting module. Module is installed in tubing string assembly above the highest productive formation. Data high-frequency signals are amplified and transmitted to ground receiving-processing unit through rock. Equipment for extraction (pumping) of product is **controlled** by communication channel or by hydraulic communication channel using independent **electronic** modules. Modules contain **housing** in which the following is installed: **valve** for **control** of supply (removal) of fluid medium **controlled** by step-type tiny engine with driving mechanism of **valve** gate rotation, autonomous power supply unit, receiver of fluid pulses and dipole receiver of electromagnetic oscillations, amplifier modules of decoding device and power amplifier.EFFECT: improving efficiency of monitoring of simultaneous separate operation of wells by means of provision of reliability of data transmission by **two-way** wireless communication between well equipment and ground receiving-processing unit.8 cl, 6 dwg

**Classifications:****International (IPC 8-9):** E21B43/00 E21B43/14

E21B47/12 (Advanced/Invention)

**CPC:** Y02B60/50**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| RU2010154792 A     | 20120710         | RU20100154792      | 20101230         |
| RU2475643 C2       | 20130220         | RU20100154792      | 20101230         |

**Priority:**

RU20100154792 20101230

**Probable Assignee:** G OBRAZOVATEL NOE UCHREZHDENIE VYSSHEGO PROFESSIONAL NOGO OBRAZOVANIJA UFIM G NEFTJANOJ TEKHN UNI GO

**Assignee(s):** (std): G OBRAZOVATEL NOE UCHREZHDENIE VYSSHEGO PROFESSIONAL NOGO OBRAZOVANIJA UFIM G NEFTJANOJ TEKHN UNI GO

**Assignee(s):** GOSUDARSTVENNOE OBRAZOVATEL NOE UCHREZHDENIE VYSSHEGO PROFESSIONAL NOGO OBRAZOVANIJA UFIMSKIY GOSUDARSTVENNYIY NEFTJANOJ TEKHNIЧЕСKIY UNIVERSITET GOU VPO UGNTU

**Inventor(s):** (std): GUTOROV JULIJ ANDREEVICH ; POTAPOV ALEKSANDR PETROVICH ; SHAKIROV AL BERT AMIRZJANOVICH ; TYNCHEOV KAMIL TALJATOVICH

**Inventor(s):** TYNCHEOV KAMIL' TALJATOVICH ; SHAKIROV AL'BERT AMIRZJANOVICH

**Legal status (INPADOC)**

View legal status timeline

| Patent         | Date recorded | Event group | Code  | Event                                            | Details                   |
|----------------|---------------|-------------|-------|--------------------------------------------------|---------------------------|
| RU2010154792 A | 20120710      | LSPB        | +     | published / reissued                             |                           |
| RU2475643 C2   | 20130220      | LSGT        | +     | granted / extensions (spc, cpc, pte)             |                           |
| RU2475643 C2   | 20140927      | LSLE        | -MM4A | THE PATENT IS INVALID DUE TO NON-PAYMENT OF FEES | EFFECTIVE DATE : 20131231 |
| RU2475643 C2   | 20301230      | PEXP        |       | Calculated Patent Term Expiry                    |                           |



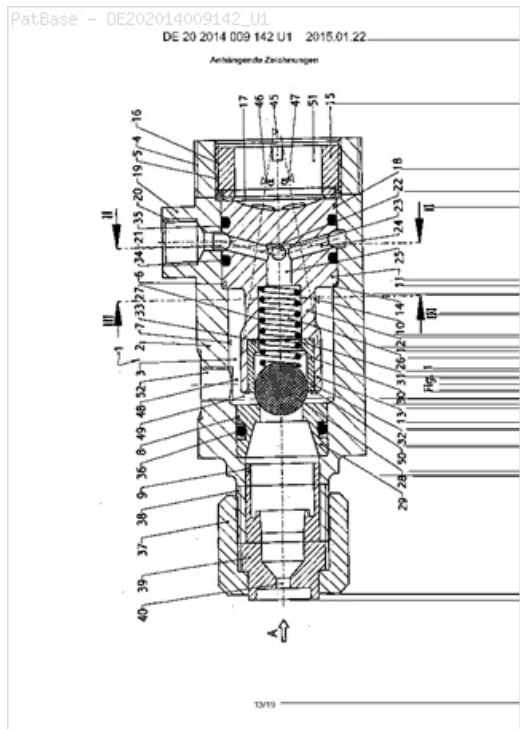
**Title:** VORRICHTUNG ZUM ENTZUNDERN VON AUS EISEN ODER AUS STAHLLEGIERUNGEN ODER AUS NICHT-EISENWERKSTOFFEN BESTEHENDEN SCHMIEDETEILEN DEVICE FOR DESCALING OF IRON OR STEEL ALLOYS OR NON-FERROUS MATERIALS FORGING PARTS OF EXISTING (Machine translation)

**Abstract:** Source: DE202014009142U1 Vorrichtung zum Entzundern von aus Eisen oder aus Stahllegierungen oder aus Nicht-Eisenwerkstoffen bestehenden Schmiedeteilen (57) mit einem Gewicht von 0,1 kg bis 4 kg, insbesondere von 0,1 bis 19 kg, vorzugsweise von 0,1 bis 50 kg, die induktiv auf Schmiedehitze erwärmt und geschmiedet und anschliessend auf verschiedenen Seiten mit einer Geschwindigkeit von 0,2 bis 2 m/s an den nur während dieser Zeitspanne im Millisekundenbereich, z. B. zwischen 20 und 50 Millisekunden, sprühenden Spruehmittelstrahlen vorbeifuehrbar sind, die unter einem von 90 Grad abweichenden Winkel (delta) auf die zu entzundernden Oberflaechen aufspritzbar sind, wobei die Spruehmittelstrahlen jeweils durch ein Duesenventil (1) zum Zufuehren von unter Druck stehender Fluessigkeit, mit einem innen huelsenfoermigen Gehaeuse (2), das an einer Stirnseite eine oeffnung (51) zur Verbindung mit einer Druckfluessigkeitsleitung und an seinem entgegengesetzten, coaxialen Ende einen auswechselbaren Duesenkoerper oder einen Anschluss oder eine Zuleitung zu einem solchen aufweist, mit einem in dem Gehaeuse angeordneten Ventilkoeper (10), der in einer zentrischen Bohrung (3) axial und radial arretiert angeordnet ist, wobei der Ventilkoeper (10) einen einem Ventilsitz zugekehrten einstueckigen Laengenabschnitt (13) aufweist, der eine ihn zentrisch durchdringende Kammer oder Bohrung (26) aufweist, in der ein unter Vorspannung stehendes Druckfederelement (27) angeordnet ist, das einen Absperrkoeper (28) in Richtung auf einen ebenfalls coaxial zu dem Absperrkoeper (28) angeordneten Ventilsitzkoeper (29) belastet, der in dem huelsenfoermigen Gehaeuse (2) angeordnet ist, und dass die das Druckfederelement (27) aufnehmende als Bohrung (26) ausgebildete Kammer des Ventilkoeppers (10) ueber mindestens einen Steuerkanal (22, 23, 24) an eine Anschlussoeffnung des Gehaeuses angeschlossen ist, die zum gesteuerten oder geregelten Zu- und Abfuehren von Druckfluessigkeit in die das Druckfederelement (27) und den Absperrkoeper (28) aufnehmende Kammer (26) dient, wobei an die stirnseitige Anschlussoeffnung (51) zum Zufuehren der Druckfluessigkeit mindestens ein Umgehungskanal (41, 42, 43, 44) angeschlossen ist, der den Ventilkoeper (10) durchdringt und in einen als Ringraum (48) ausgebildeten Ringkanal ausmündet, der einerseits durch die Innenseite des Gehaeuses (2) und andererseits durch die Aussenmantelflaeche des Ventilkoeppers (10) gebildet ist, wobei dieser Ringkanal (48) auch an einen Raum (49) druckmittelteilend angeschlossen ist, der zwischen der dem Absperrkoeper (28) zugekehrten Stirnseite des Ventilkoeppers (10) und der Stirnseite des Ventilsitzkoeppers (29) andererseits gebildet ist, wobei die Ventilduesen (1, 63) in Segmenten, Spritzbalken oder als Einzelduesen angeordnet sind, die einzeln oder gruppenweise im Millisekundenbereich intermittierend in Offenstellung oder in Absperrstellung steuerbar sind, mit einer Erkennungsvorrichtung (64), die entweder mit Lichtschranken oder mit Fotozellen oder mit einem Gammakopf oder sonstigen Sensoren arbeitet, die das Passieren des zu entzundernden Schmiedeteils (57) detektiert und dann ein Signal an die dafuer zustaeendige Vorrichtung weitergibt, die daraufhin die Duesenventile ansteuert, die dann ihre Spruehmittelstrahlen (65 und/oder 66), zeitlich versetzt, auf das zu entzundernde Schmiedeteil spruehen und es entzundern, wobei vorzugsweise die Duesenventile (1, 63) durch eine Verstellvorrichtung (70) gemeinsam hinsichtlich ihres Spruehwinkels einstellbar sind und insbesondere die Verstellvorrichtung in eine geeignete elektronische oder elektrische Steuerung, zum Beispiel in eine SPS-Steuerung,... Apparatus for descaling consisting of iron or steel alloys or of non-ferrous materials forgings (57) having a weight of 0.1 kg to 4 kg, in particular from 0.1 to 19 kg, preferably from 0.1 to 50 kg warmed up the inductively to forging heat and forged and then see this period in milliseconds, for. example, between 20 and 50 milliseconds, sparkling Spruehmittelstrahlen are on different sides at a rate of 0.2 to 2 m / only during the vorbeifuehrbar that is at an angle deviating from 90 degrees (delta) on the surface to be descaled are aufspritzbar, wherein the Spruehmittelstrahlen respectively by a Duesenventil (1) for supplying liquid under pressure, having an inner huelsenfoermigen **housing** (2) attached to a end side has an opening (51) for connection to a Druckfluessigkeitsleitung and at its opposite, coaxial end a replaceable Duesenkoerper or a terminal or a feed line to such a, with, disposed in the **housing** Ventilkoeper (10) in a central bore (3) is arranged locked axially and radially, said Ventilkoeper (10) has a **valve** seat facing integral Laengenabschnitt (13) having a him centrally penetrating chamber or bore (26) in which a standing under pretension integral compression spring element (27) is arranged having a shut-off body (28) towards a likewise coaxial with the shut-off body (28) arranged Ventilsitzkoeper (29) loaded, is arranged in the huelsenfoermigen **housing** (2), and that the compression spring element (27) accommodates a bore (26) chamber formed of Ventilkoeppers (10) by at least one **control** channel (22, 23, 24) is connected to a Anschlussoeffnung the **electronic** exchange that for the **controlled** or regulated supply and removal of Druckfluessigkeit in which the compression spring element (27) and the shut-off (28) accommodating chamber (26), wherein at the end face Anschlussoeffnung (51) for supplying the Druckfluessigkeit at least one bypass passage (41, 42, 43, 44) is connected, which penetrates the Ventilkoeper (10) and in one as an annular space (48) formed annular channel opens, which is formed on the one hand through the inside of the **housing** (2) and the other by the Aussenmantelflaeche of Ventilkoeppers (10), said annular channel (48) and a room (49) is connected fluid-conductive, between the shut-off (28) end facing the Ventilkoeppers (10) and the front side of the Ventilsitzkoeppers (29) on the other hand, said the Ventilduesen (1, 63) are arranged in segments, spray bars or as Einzelduesen which, individually or in groups in the millisecond range intermittently in the open position or in are shut-**controlled**, with a detection device (64), which works with either photocells or with photocells or with a gamma head or other sensors that detect the passage of the to be descaled forging (57) and then transmits a signal to the responsible for that device thereupon **controls** the Duesenventile, which then their Spruehmittelstrahlen (65 and / or 66), offset in time, spraying onto the material to be descaled forging and descaling it, wherein preferably the Duesenventile (1, 63) by an adjusting device (70) jointly with regard to their spray angle adjustable are, in particular, the adjustment in a suitable **electronic** or electrical **control**, for example, a PLC **control**...

**Classifications:**

**International (IPC 8-9):** B21B45/08 B21J5/00 (Advanced/Invention)

**CPC:** B21C43/00 B24C1/086 B21B45/08



#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE202014009142 U1  | 20150122         | DE201420009142U    | 20141118         |

#### Priority:

DE201310020636 20131216 DE201420009142U 20141118

#### Probable Assignee:

PRZYBYLLA GREGOR

#### Assignee(s): (std):

PRZYBYLLA GREGOR

#### Assignee(s):

PRZYBYLLA

#### Legal status (INPADOC)

[View legal status timeline](#)

| Patent            | Date recorded | Event group | Code  | Event                                  | Details                   |
|-------------------|---------------|-------------|-------|----------------------------------------|---------------------------|
| DE202014009142 U1 | 20150122      | LSGT        | +     | granted / extensions (spc, cpc, pte)   |                           |
| DE202014009142 U1 | 20150122      | LSGT        | R207  | UTILITY MODEL SPECIFICATION            | EFFECTIVE DATE : 20150122 |
| DE202014009142 U1 | 20171122      | LSGT        | +R150 | TERM OF PROTECTION EXTENDED TO 6 YEARS |                           |
| DE202014009142 U1 | 20241118      | PEXP        |       | Calculated Patent Term Expiry          |                           |

**Title:** Method and apparatus for collecting atmospheric samples in atmospheric geochemical prospecting

**Abstract:** Source: US3970428A Method and apparatus for airborne prospecting in which samples of atmospheric gases, vapors or particulates are collected and contemporaneously the atmosphere near where the samples are collected is monitored to determine whether the respective samples were uplifted by an updraft of air. Samples respectively collected during periods of updrafts are separated from the remainder of said samples, and the samples respectively collected during periods of updrafts are analyzed separately from the remainder of said samples.

**Classifications:**

**International (IPC 8-9):** G01N1/02 G01N33/24 G01V5/02

G01V9/00 (Advanced/Invention);

G01N1/02 G01V5/00 G01V9/00 (Core/Invention)

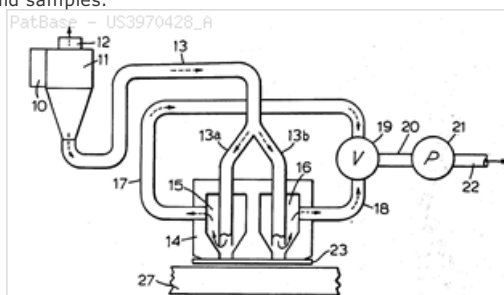
**International (IPC 1-7):** B01L G01N1/10 G01N1/22 G01N1/24

G01N33/00 G01N33/24 G01V11/00 G01V3/00 G01V9/00 G01W1/00

**CPC:** G01V5/025 G01V9/007

**European:** G01V5/02B G01V9/00C

**US:** 23/230EP 422/83 436/149 436/29 436/57 73/28.01 73/863.21 73/863.22



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU197586647 A1     | 19770519         | AU19750086647      | 19751114         |
| BR7507692 A        | 19760810         | BR19750007692      | 19751120         |
| CA1054498 A1       | 19790515         | CA19750239208      | 19751103         |
| DE2552055 A1       | 19760526         | DE19752552055      | 19751120         |
| DE2552055 B2       | 19781116         | DE19752552055      | 19751120         |
| DE2552055 C3       | 19790809         | DE19752552055      | 19751120         |
| ES442877 A1        | 19770401         | ES19750442877      | 19751121         |
| FR2292241 A1       | 19760618         | FR19750035618      | 19751121         |
| FR2292241 B1       | 19790406         | FR19750035618      | 19751121         |
| GB1480419 A        | 19770720         | GB19740050849      | 19741123         |
| IN144373 A         | 19780429         | IN1975CA02166      | 19751112         |
| IT1052359 A        | 19810620         | IT19750052337      | 19751121         |
| JP51077385 A2      | 19760705         | JP19750140087      | 19751121         |
| SE7513118 A        | 19760524         | SE19750013118D     | 19751121         |
| US3970428 A        | 19760720         | US19750629264      | 19751106         |
| ZA7507034 A        | 19761027         | ZA19750007034      | 19751110         |

**Priority:**

GB19740050849 19741123

**Probable Assignee:** BARRINGER RESEARCH LTD

**Assignee(s):** (std): BARRINGER RESEARCH LTD

**Assignee(s):** BARRINGER RESEARCH LTD REXDALE ONTARIO CANADA ; BAARINJAA RISAACHI LTD ; BARRINGER ANTHONY R ; BARRINGER RES LTD ; BARRINGER RESEARCH LIMITED

**Inventor(s):** (std): BARRINGER A ; BARRINGER A R ; BARRINGER ANTHONY R ; BARRINGER ANTHONY RENE ; ANSONII RIIN PAARINJAA

**Inventor(s):** ANTHONY RENE BARRINGER ; BARRINGER ANTHONY RENE WILLOWDALE ONTARIO CANADA ; RENE BARRINGER ANTHONY

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent       | Date recorded | Event group | Code  | Event                                               | Details |
|--------------|---------------|-------------|-------|-----------------------------------------------------|---------|
| BR7507692 A  | 19760810      | LSPB        | +     | published / reissued                                |         |
| DE2552055 A1 | 19760526      | LSPB        | +     | published / reissued                                |         |
| DE2552055 A1 | 19790809      | LSGT        | +C3   | GRANT AFTER TWO PUBLICATION STEPS (3RD PUBLICATION) |         |
| DE2552055 A1 | 19841108      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                |         |
| DE2552055 B2 | 19781116      | LSPB        | +     | published / reissued                                |         |
| DE2552055 C3 | 19790809      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |         |
| ES442877 A1  | 19770401      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |         |
| FR2292241 A1 | 19760618      | LSPB        | +     | published / reissued                                |         |
| FR2292241 A1 | 19840921      | LSLE        | -ST   | NOTIFICATION OF LAPSE                               |         |
| FR2292241 B1 | 19790406      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |         |
| FR2292241 B1 | 19951121      | PEXP        |       | Calculated Patent Term Expiry                       |         |
| GB1480419 A  | 19770720      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |         |
| GB1480419 A  | 19771130      | LSGT        | +PS   | PATENT SEALED                                       |         |
| GB1480419 A  | 19900711      | LSLE        | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE    |         |

|               |          |      |   |                                      |
|---------------|----------|------|---|--------------------------------------|
| GB1480419 A   | 19941123 | PEXP |   | Calculated Patent Term Expiry        |
| IN144373 A    | 19780429 | LSPB | + | published / reissued                 |
| IT1052359 A   | 19810620 | LSGT | + | granted / extensions (spc, cpc, pte) |
| IT1052359 A   | 19951121 | PEXP |   | Calculated Patent Term Expiry        |
| JP51077385 A2 | 19760705 | LSPB | + | published / reissued                 |
| SE7513118 A   | 19760524 | LSPB | + | published / reissued                 |
| US3970428 A   | 19760720 | LSGT | + | granted / extensions (spc, cpc, pte) |
| ZA7507034 A   | 19761027 | LSGT | + | granted / extensions (spc, cpc, pte) |
| ZA7507034 A   | 19911109 | PEXP |   | Calculated Patent Term Expiry        |