

**Search history**

Search 1: FT=(BEARING~ AND ROLL~ SHAFT~ AND MOLTEN~ PLATING~ DEVICE~) (Results 1)

Search 2: ft=(bearing~ and roll~ shaft~ and molten~ plating~ device~) (Results 1)

Search 3: ft=(roll~ shaft~ and molten) (Results 941)

**Title:** Improved continuous casting secondary cooling supporting roller seat

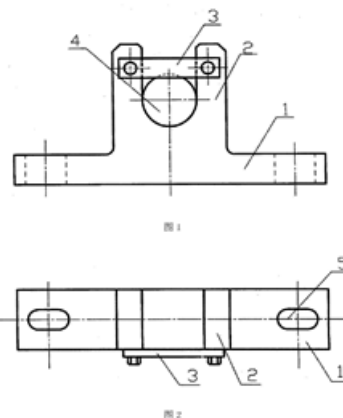
**Abstract:** The utility model belongs to improvement of a secondary cooling supporting roller seat structure with molten steel continuously casting into a secondary cooling region, and in particular relates to an improved continuous casting secondary cooling supporting roller seat. The improved continuous casting secondary cooling supporting roller seat comprises a supporting roller seat, wherein the supporting roller seat is matched with a supporting roller shaft; an installation hole is arranged on the base of the supporting roller seat; a support of the supporting roller seat, which is matched with the supporting roller shaft, is a U-shaped support with an opening at the upper end; the width of a U-shaped open slot is radially matched with the supporting roller shaft; a locating plate matched with a locating slot of the supporting roller shaft is installed on support body side walls located at two sides of the U-shaped open slot and at the upper part of the supporting roller shaft through bolts, respectively; and the supporting roller shaft is fixedly connected to the U-shaped support of the supporting roller shaft. The improved continuous casting secondary cooling supporting roller seat is reasonable in structure; a supporting roller is convenient to exchange; the supporting roller can be directly exchanged without disassembling the supporting roller seat; the exchanging time is short; and the work efficiency is high.

**Classifications:**

**International (IPC 8-9):** B22D11/124 (Advanced/Invention)

PatBase - CN202377506\_U

CN 202377506 U 说明书附图 1/3 页



#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN202377506 U      | 20120815         | CN201120531089U    | 20111219         |

#### Priority:

CN201120531089U 20111219

|                            |                                     |
|----------------------------|-------------------------------------|
| <b>Probable Assignee:</b>  | XINJIANG BAYI IRON AND STEEL CO     |
| <b>Assignee(s): (std):</b> | XINJIANG BAYI IRON AND STEEL CO     |
| <b>Assignee(s):</b>        | XINJIANG BAYI IRON AND STEEL CO LTD |
| <b>Inventor(s): (std):</b> | HAITAO ZHANG ; JIANXIN WANG         |
| <b>Inventor(s):</b>        | WANG JIANXIN ; ZHANG HAITAO         |

#### Legal status (INPADOC)

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| Patent        | Date recorded | Event group | Code  | Event                                        | Details |
|---------------|---------------|-------------|-------|----------------------------------------------|---------|
| CN202377506 U | 20120815      | LSGT        | +     | granted / extensions (spc, cpc, pte)         |         |
| CN202377506 U | 20120815      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL             |         |
| CN202377506 U | 20160210      | LSWD        | -EXPY | TERMINATION OF PATENT RIGHT OR UTILITY MODEL |         |
| CN202377506 U | 20211219      | PEXP        |       | Calculated Patent Term Expiry                |         |

**Title:** CONTINUOUS CASTING OF ONE- OR TWO-SIDE CLAD THIN METAL STRIP

**Abstract:** A metal strip casting process comprises (a) casting **molten** metal (11) on a horizontal section (7) of an endless belt (5) to form a solidified external layer (13); (b) passing the belt (5) and the layer (13) over a horizontal roll (1) which cooperates with a second horizontal roll (2) to form a casting gap (4'); and (c) casting a core metal melt (16) in the gap where it welds to the external layer (13). An Independent claim is also included for a metal (especially steel) strip casting machine. Preferred Features: A second external layer (14) is similarly cast on a second endless belt (6) which is then passed over the second horizontal roll (2) into the casting gap (4'). The or each external layer (13, 14) consists of a special steel, a stainless steel or a non-ferrous metal and the core consists of an ordinary steel.

**Classifications:**

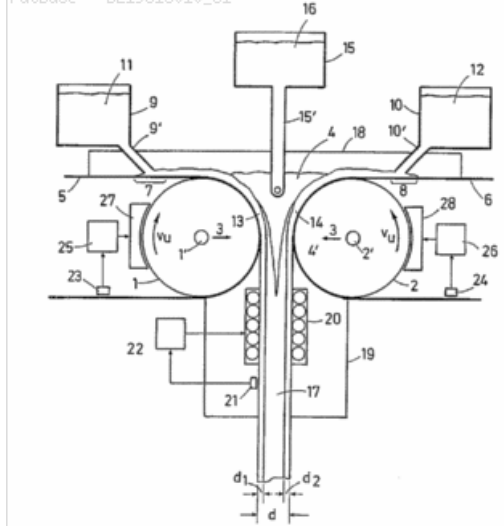
**International (IPC 8-9):** B22D11/00 B22D11/06 (Advanced/Invention);  
B22D11/00 B22D11/06 (Core/Invention)

**International (IPC 1-7):** B22D11/04 B22D11/06 B22D11/10  
B22D7/02

**CPC:** B22D11/007 B22D11/0622

**European:** B22D11/00D B22D11/06E

PatBase - DE19815010\_C1

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE19815010 C1      | 19990506         | DE19981015010      | 19980403         |

**Priority:**

DE19981002421 19980123      DE19981015010 19980403

**Probable Assignee:** SCHLOEMANN SIEMAG AG

**Assignee(s):** (std): SCHLOEMANN SIEMAG AG

**Assignee(s):** SMS SCHLOEMANN SIEMAG AG ; SMS SCHLOEMANN SIEMAG AG 40237 DUESSELDORF DE

**Inventor(s):** (std): BINDER WINFRIED DIPL ING ; FELDHAUS STEPHAN DIPL ING ; PARSchAT LoTHAR DIPL ING ;  
PLESCHIUTSCHNIGG FRITZ PETER P ; VONDERBANK MICHAEL DR ING

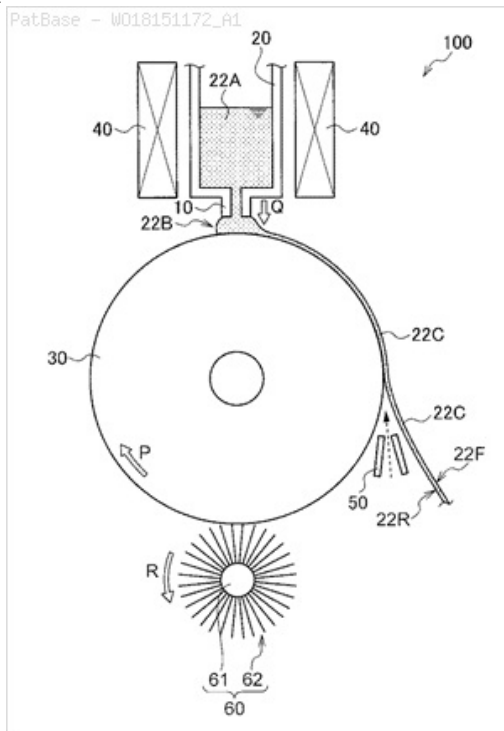
**Inventor(s):** VONDERBANK MICHAEL DR ING 46509 XANTEN DE ; PLESCHIUTSCHNIGG FRITZ PETER PROF DR ING ;  
PLESCHIUTSCHNIGG FRITZ PETER PROF DR ING 47269 DUI ; PARSchAT LoTHAR DIPL ING 40885  
RATINGEN DE ; FELDHAUS STEPHAN DIPL ING DIPL WIRTSCH ING ; FELDHAUS STEPHAN DIPL ING  
DIPL WIRTSCH ING 45481 M ; BINDER WINFRIED DIPL ING 47623 KEVELAER DE

**Legal status (INPADOC)**

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| Patent        | Date recorded | Event group | Code  | Event                                                                                 | Details                                                                   |
|---------------|---------------|-------------|-------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| DE19815010 C1 | 19990506      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                           |
| DE19815010 C1 | 19990506      | LSPB        | +8100 | PUBLICATION OF THE EXAMINED APPLICATION WITHOUT PUBLICATION OF UNEXAMINED APPLICATION |                                                                           |
| DE19815010 C1 | 19990506      | LSGT        | +D1   | GRANT (NO UNEXAMINED APPLICATION PUBLISHED) PATENT LAW 81                             |                                                                           |
| DE19815010 C1 | 19991104      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                               |                                                                           |
| DE19815010 C1 | 20000621      | LSAS        | 8327  | CHANGE IN THE PERSON/NAME/ADDRESS OF THE PATENT OWNER                                 | PARTYTYPE :<br>OWNER<br>OWNER : SMS<br>DEMAG AG, 40237<br>DUESSELDORF, DE |
| DE19815010 C1 | 20040212      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                                  |                                                                           |
| DE19815010 C1 | 20180403      | PEXP        |       | Calculated Patent Term Expiry                                                         |                                                                           |

**CPC:** B22D11/06 C22C45/02 H01F1/153



| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| TW201840868 A      | 20181116         | TW20180105390      | 20180214         |
| WO18151172 A1      | 20180823         | WO2018JP05129      | 20180214         |

**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 DJ 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 JO JP KE KG KH KM KN KP KR KW 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 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 UB UG UZ VC VN ZA ZM ZW

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| Patent        | Date recorded | Event group | Code | Event                             | Details                                                                                                                    |
|---------------|---------------|-------------|------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| TW201840868 A | 20181116      | LSPB        | +    | published / reissued              |                                                                                                                            |
| WO18151172 A1 | 20180823      | LSPB        | +    | published / reissued              |                                                                                                                            |
| WO18151172 A1 | 20190705      | LSNP        | ENP  | ENTRY INTO THE NATIONAL PHASE IN: | REF DOCUMENT NUMBER : 2018568579<br>COUNTRY OF REF DOCUMENT : JP<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) : |

**Title:** ROLL LINE ASSEMBLY FOR CONTINUOUS CASTING

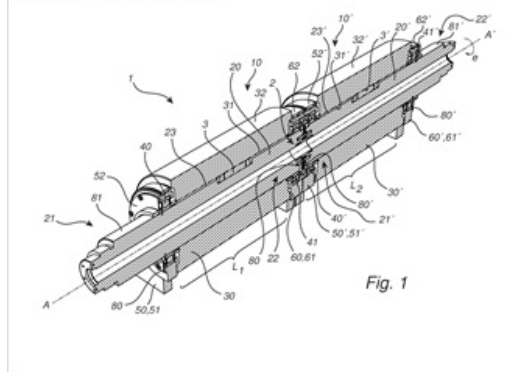
**Abstract:** The present invention relates to a roll line assembly (1) for supporting and transporting hot material in a continuous caster, comprising a first assembly unit (10) and a second assembly unit (10'); the first assembly unit (10) comprising: a rotatable first shaft (20) having a first end region (21) and a second end region (22) along the first longitudinal axis (A), a first roll mantle (30) enclosing the rotatable first shaft (20) around a circumferential direction, a first bearing (40) and a second bearing (41) for allowing rotation of the first roll mantle (30) and the rotatable first shaft (20) about the first longitudinal axis (A), wherein the first bearing (40) is arranged on the first end region (21) and the second bearing (41) is arranged on the second end region (22). The second assembly unit (10') is constructed in a analogous way, wherein the rotatable first shaft (20) is configured to be releasably connected to the rotatable second shaft (20') such that the rotatable first shaft (20) and the rotatable second shaft (20') can be maintained in longitudinal axial alignment during rotation of the roll line assembly (1), whereby the first assembly unit (10) is operatively engaged with the second assembly unit (10').

**Classifications:****International (IPC 8-9):** B22D11/128 B65G39/18

F16C11/02 (Advanced/Invention)

**CPC:** B22D11/1287 F16C13/00 B65G39/07 F16C2322/00

PatBase - WO15034421\_R1

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN105636722 A      | 20160601         | CN201480056518     | 20140902         |
| CN105636722 B      | 20190820         | CN201480056518     | 20140902         |
| EP3041620 A1       | 20160713         | EP20140842460      | 20140902         |
| EP3041620 A4       | 20170419         | EP20140842460      | 20140902         |
| WO15034421 A1      | 20150312         | WO2014SE51008      | 20140902         |

**Priority:**

SE20130000577 20130904

WO2014SE51008 20140902

**Probable Assignee:** SKF AB**Assignee(s):** (std): AB SKF ; SKF AB**Inventor(s):** (std): MITCHELL ERIK ; COSTA PATRIK**Agent(s):** GENTZEL MARCUS

**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 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 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

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| Patent        | Date recorded | Event group | Code  | Event                                               | Details                   |
|---------------|---------------|-------------|-------|-----------------------------------------------------|---------------------------|
| CN105636722 A | 20160601      | LSPB        | +     | published / reissued                                |                           |
| CN105636722 A | 20160601      | LSPB        | +C06  | PUBLICATION                                         |                           |
| CN105636722 A | 20160601      | LSPB        | PB01  | 公开 (The publication of application)                 | TEXT : 公开 (DISCLOSURE)    |
| CN105636722 B | 20190820      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |                           |
| CN105636722 B | 20190820      | LSGT        | +GR01 | 授权 (The grant of patent right)                      | TEXT : 授权 (AUTHORIZATION) |
| CN105636722 B | 20340902      | PEXP        |       | Calculated Patent Term Expiry                       |                           |
| EP3041620 A1  | 20160713      | LSPB        | +     | published / reissued                                |                           |
| EP3041620 A1  | 20160713      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                       | EFFECTIVE DATE : 20160404 |
| EP3041620 A4  | 20170419      | LSES        | +A4   | SUPPLEMENTARY SEARCH REPORT DRAWN UP AND DESPATCHED | EFFECTIVE DATE : 20170316 |
| EP3041620 A4  | 20180110      | LSES        | +17Q  | FIRST EXAMINATION REPORT DESPATCHED                 | EFFECTIVE DATE : 20171208 |
| EP3041620 A4  | 20190619      | LSGT        | +INTG | INTENTION TO GRANT                                  | EFFECTIVE DATE :          |

|               |          |      |      |                                             |                                                                  |
|---------------|----------|------|------|---------------------------------------------|------------------------------------------------------------------|
|               |          |      |      | ANNOUNCED                                   | 20190520                                                         |
| WO15034421 A1 | 20150312 | LSPB | +    | published / reissued                        |                                                                  |
| WO15034421 A1 | 20160304 | LSNE | NENP | NON-ENTRY INTO THE NATIONAL PHASE IN:       | REF COUNTRY CODE : DE                                            |
| WO15034421 A1 | 20160330 | LSNP | +WWE | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE | REF DOCUMENT NUMBER : 2014842460<br>COUNTRY OF REF DOCUMENT : EP |

**Title:** AUTOMATIC SOLDERING MACHINES

**Abstract:** An automatic spot soldering machine incorporates apparatus for automatically sequencing through operations for forming soldered joints at a predetermined position. The sequence includes preforming a quantity of solder from a length of solder wire and positioning it on the joint, and lowering a soldering iron into position for a predetermined period of time. The solder wire is advanced and retracted by a reversible clutch incorporating a rotatable disk and a concentric clamping ring.

**Classifications:**

**International (IPC 8-9):** B23K3/00 H01R43/02 (Advanced/Invention);

B23K3/00 H01R43/02 (Core/Invention)

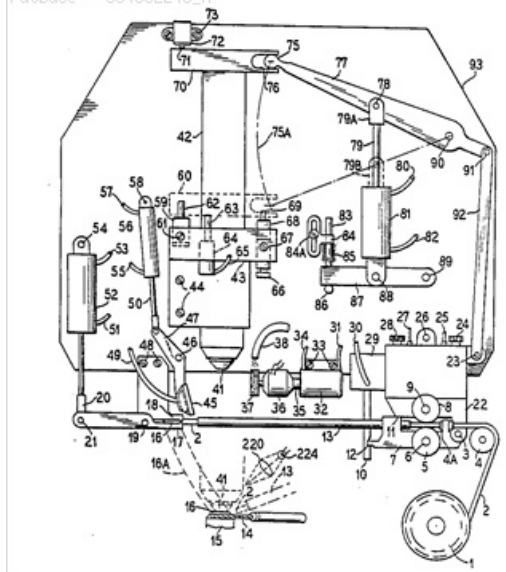
**International (IPC 1-7):** B23K3/00 B23K3/06

**CPC:** B23K3/00 H01R43/02

**European:** B23K3/00 H01R43/02

**US:** 228/1.1 228/14 228/15.1 228/35 228/41 228/45 228/52 228/56.3 228/8

PatBase - US4832246\_A



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT62846 E          | 19910515         | AT19870100464T     | 19870115         |
| CA1314174 A1       | 19930309         | CA19870527236      | 19870113         |
| DE3769486 D1       | 19910529         | DE19873769486      | 19870115         |
| EP0232743 A1       | 19870819         | EP19870100464      | 19870115         |
| EP0232743 B1       | 19910424         | EP19870100464      | 19870115         |
| JP62212057 A2      | 19870918         | JP19870008754      | 19870117         |
| KR19870006946 A    | 19870813         | KR19870000335      | 19870117         |
| KR960002109 B1     | 19960210         | KR19870000335      | 19870117         |
| US4832246 A        | 19890523         | US19880262190      | 19881019         |

**Priority:**

|                        |                        |                        |
|------------------------|------------------------|------------------------|
| US19860820437 19860117 | US19860925502 19861029 | CA19870527236 19870113 |
| EP19870100464 19870115 | US19870102398 19870929 | US19880262190 19881019 |

**Probable Assignee:** HIESHIMA HOWARD

**Assignee(s):** (std): HARI O NO ; HAWAADO HIESHIMA ; HIESHIMA HOWARD ; ONO HARRY ; MEIXNER ROBERT ; ROBAATO MAIKUSUNAA

**Assignee(s):** MEIXNER ROBERT SKOKIE ILL US ; ONO HARRY DES PLAINES ILL US ; HIESHIMA HOWARD CHICAGO ILL US

**Inventor(s):** (std): ONO HARRY ; HIESHIMA HOWARD ; MEIXNER ROBERT ; HAWAADO HIESHIMA ; ROBAATO MAIKUSUNAA ; HARI O NO

**Inventor(s):** MEIXNER ROBERT SKOKIE ILL ; HIESHIMA HOWARD CHICAGO ILL ; ONO HARRY DES PLAINES ILL ; MEIXNER ROBERT SKOKIE ILL US ; ONO HARRY DES PLAINES ILL US ; HIESHIMA HOWARD CHICAGO ILL US

**Agent(s):** CASSAN MACLEAN

**Designated states:** AT BE CH DE ES FR GB GR IT LI LU NL SE

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code  | Event                                                           | Details |
|--------------|---------------|-------------|-------|-----------------------------------------------------------------|---------|
| AT62846 E    | 19910515      | LSGT        | +     | granted / extensions (spc, cpc, pte)                            |         |
| AT62846 E    | 19911015      | LSLE        | -RER  | CEASED AS TO PARAGRAPH 5 LIT. 3 LAW INTRODUCING PATENT TREATIES |         |
| AT62846 E    | 20070115      | PEXP        |       | Calculated Patent Term Expiry                                   |         |
| CA1314174 A1 | 19930309      | LSGT        | +     | granted / extensions (spc, cpc, pte)                            |         |
| CA1314174 A1 | 19950911      | LSLE        | -MKLA | LAPSED                                                          |         |
| CA1314174 A1 | 20100309      | PEXP        |       | Calculated Patent Term Expiry                                   |         |

|              |          |      |       |                                                                                                 |                                                                                                                                                                                                         |
|--------------|----------|------|-------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DE3769486 D1 | 19920521 | LSGT | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                                         |                                                                                                                                                                                                         |
| DE3769486 D1 | 19930506 | LSLE | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                                            |                                                                                                                                                                                                         |
| EP0232743 A1 | 19870819 | LSPB | +     | published / reissued                                                                            |                                                                                                                                                                                                         |
| EP0232743 A1 | 19880420 | LSES | +17P  | REQUEST FOR EXAMINATION FILED                                                                   | EFFECTIVE DATE : 19880218                                                                                                                                                                               |
| EP0232743 A1 | 19890510 | LSES | +17Q  | FIRST EXAMINATION REPORT DESPATCHED                                                             | EFFECTIVE DATE : 19890322                                                                                                                                                                               |
| EP0232743 B1 | 19910424 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                            |                                                                                                                                                                                                         |
| EP0232743 B1 | 19910424 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : AT<br>LAPSED DATE : 19910424                                                                                                                                                  |
| EP0232743 B1 | 19910424 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : BE<br>LAPSED DATE : 19910424                                                                                                                                                  |
| EP0232743 B1 | 19910424 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : CH<br>LAPSED DATE : 19910424                                                                                                                                                  |
| EP0232743 B1 | 19910424 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : LI<br>LAPSED DATE : 19910424                                                                                                                                                  |
| EP0232743 B1 | 19910424 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : NL<br>LAPSED DATE : 19910424                                                                                                                                                  |
| EP0232743 B1 | 19910424 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : SE<br>LAPSED DATE : 19910424                                                                                                                                                  |
| EP0232743 B1 | 19910424 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : GR<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 : 19910424 |
| EP0232743 B1 | 19910424 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : IT<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 : 19910424 |
| EP0232743 B1 | 19910731 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                                      |
| EP0232743 B1 | 19910804 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : ES<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 : 19910804 |
| EP0232743 B1 | 19910916 | LSLE | -NLV1 | NL: LAPSED OR ANNULLED DUE TO FAILURE TO FULFILL                                                | REF COUNTRY CODE : EP                                                                                                                                                                                   |

|                 |          |       |       |                                                                                                                                                            |                                                                                                                            |
|-----------------|----------|-------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| EP0232743 B1    | 19910920 | LSLE  | -PG25 | THE REQUIREMENTS OF ART. 29P AND 29M OF THE PATENTS ACT<br>LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : FR<br>LAPSED DATE : 19910920                                                                     |
| EP0232743 B1    | 19920131 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO]                                                            | COUNTRY OF REF DOCUMENT : LU<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 19920131 |
| EP0232743 B1    | 19920415 | LSGT  | +26N  | NO OPPOSITION FILED                                                                                                                                        |                                                                                                                            |
| EP0232743 B1    | 19921127 | LSLE  | REG   | REFERENCE TO A NATIONAL CODE                                                                                                                               | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST                                                                         |
| EP0232743 B1    | 19930202 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO]                                                            | COUNTRY OF REF DOCUMENT : DE<br>LAPSED DATE : 19930202                                                                     |
| EP0232743 B1    | 19940113 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                                                                                 | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 19940113<br>YEAR OF FEE PAYMENT : 8                                         |
| EP0232743 B1    | 19950115 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO]                                                            | COUNTRY OF REF DOCUMENT : GB<br>LAPSED DATE : 19950115                                                                     |
| EP0232743 B1    | 19950913 | LSLE  | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                                                                                              | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 19950115                                                                         |
| EP0232743 B1    | 20070115 | PEXP  |       | Calculated Patent Term Expiry                                                                                                                              |                                                                                                                            |
| JP62212057 A2   | 19870918 | LSPB  | +     | published / reissued                                                                                                                                       |                                                                                                                            |
| KR19870006946 A | 19870813 | LSPB  | +     | published / reissued                                                                                                                                       |                                                                                                                            |
| KR960002109 B1  | 19960210 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                                                                                       |                                                                                                                            |
| KR960002109 B1  | 19911224 | LSSES | A201  | REQUEST FOR EXAMINATION                                                                                                                                    |                                                                                                                            |
| KR960002109 B1  | 19951004 | LSSES | -E902 | NOTIFICATION OF REASON FOR REFUSAL                                                                                                                         |                                                                                                                            |
| KR960002109 B1  | 19960118 | LSPB  | G160  | DECISION TO PUBLISH PATENT APPLICATION                                                                                                                     |                                                                                                                            |
| KR960002109 B1  | 19960424 | LSGT  | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT                                                                                                          |                                                                                                                            |
| KR960002109 B1  | 20020117 | PEXP  |       | Calculated Patent Term Expiry                                                                                                                              |                                                                                                                            |
| US4832246 A     | 19890523 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                                                                                       |                                                                                                                            |
| US4832246 A     | 19890330 | LSGT  | PAT1  | Patented Case                                                                                                                                              |                                                                                                                            |
| US4832246 A     | 19920908 | LSFE  | +FPAY | FEE PAYMENT                                                                                                                                                | YEAR OF FEE PAYMENT : 4                                                                                                    |
| US4832246 A     | 19970525 | LSLE  | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                                                                                                                  |                                                                                                                            |
| US4832246 A     | 19970805 | LSLE  | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                                                                                                              | EFFECTIVE DATE : 19970528                                                                                                  |
| US4832246 A     | 20180129 | LSLE  | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362                                                                                    |                                                                                                                            |
| US4832246 A     | 20180129 | LSLE  | -STCH | INFORMATION ON STATUS: PATENT DISCONTINUATION                                                                                                              | TEXT : PATENT EXPIRED DUE TO NONPAYMENT OF MAINTENANCE FEES UNDER 37 CFR 1.362                                             |

|             |          |      |                                  |
|-------------|----------|------|----------------------------------|
| US4832246 A | 20081019 | PEXP | Calculated Patent<br>Term Expiry |
|-------------|----------|------|----------------------------------|

**Title:** Method of forming color images and apparatus used therefor

**Abstract:** A color image is obtained by (i) providing a peelable transfer layer 12 on an electrophotographic light-sensitive element 11 comprising a support 1 and a light-sensitive layer 2, (ii) forming one or more color toner images 3 on the transfer layer by a conventional electrophotographic process, (iii) transferring the toner image 3 together with the transfer layer 12 onto a primary receptor 20, and then (iv) transferring the toner images 3 together with the transfer layer 12 onto a final receiving material 30. According to the method, a color duplicate of high accuracy and high quality without color shear is obtained, and a color image is easily transferred irrespective of the kind of a final receiving material. Further, since there is no residual toner image at the transfer, the light-sensitive element and intermediate medium are repeatedly usable.

**Classifications:**

**International (IPC 8-9):** B65F1/16 G03G13/01 G03G15/01

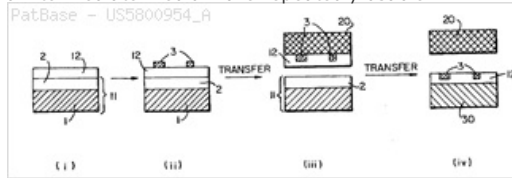
G03G5/147 G03G7/00 (Advanced/Invention);  
B65F1/16 G03G13/01 G03G15/01 G03G5/147  
G03G7/00 (Core/Invention)

**International (IPC 1-7):** B65F1/16 G03G13/01 G03G13/16  
G03G15/01 G03G15/16

**CPC:** G03G5/147 G03G7/00 G03G13/01 G03G15/01

**European:** G03G13/01 G03G15/01 G03G5/147 G03G7/00

**US:** 399/302 399/308 430/126 430/47 430/47.3 430/47.4 430/47.5



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE69420714 D1      | 19991021         | DE19946020714      | 19940329         |
| EP0692743 A1       | 19960117         | EP19940910558      | 19940329         |
| EP0692743 A4       | 19970212         | EP19940910558      | 19940329         |
| EP0692743 B1       | 19990915         | EP19940910558      | 19940329         |
| JP7076402 A2       | 19950320         | JP19930246040      | 19930908         |
| US5800954 A        | 19980901         | US19970853411      | 19970509         |
| WO9423346 A1       | 19941013         | WO1994JP00507      | 19940329         |

**Priority:**

|               |          |               |          |               |          |
|---------------|----------|---------------|----------|---------------|----------|
| JP19930091913 | 19930329 | JP19930146770 | 19930527 | JP19930240279 | 19930902 |
| JP19930246040 | 19930908 | JP19930246048 | 19930908 | JP19930354624 | 19931228 |
| WO1994JP00507 | 19940329 | US19950505345 | 19950830 | US19970853411 | 19970509 |

**Probable Assignee:** FUJIFILM HOLDINGS CORP

**Assignee(s):** (std): KATO EIICHI ; NAKAZAWA YUSUKE ; OSAWA SADA0 ; SANYO SHIKI KK ; FUJI PHOTO FILM CO LTD

**Assignee(s):** FUJIFILM CORP ; FUJIFILM HOLDINGS CORP ; FUJI PHOTO FILM CO

**Inventor(s):** (std): OSAWA SADA0 ; NAKAZAWA YUSUKE FUJI PHOTO FIL ; NAKAZAWA YUSUKE ; KATO EIICHI ; INABA KOICHI

**Inventor(s):** NAKAZAWA YUSUKE FUJI PHOTO FILM CO ; NAKAZAWA YUSUKE FUJI PHOTO FILM CO LTD

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

**Legal status (INPADOC)**

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| Patent        | Date recorded | Event group | Code  | Event                                                                                           | Details                                                                                                                                                                                                  |
|---------------|---------------|-------------|-------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DE69420714 D1 | 20000323      | LSWD        | -8332 | NO LEGAL EFFECT FOR DE                                                                          |                                                                                                                                                                                                          |
| EP0692743 A1  | 19960117      | LSPB        | +     | published / reissued                                                                            |                                                                                                                                                                                                          |
| EP0692743 A1  | 19960117      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                                                                   | EFFECTIVE DATE : 19950825                                                                                                                                                                                |
| EP0692743 A1  | 19960410      | LSRE        | K1C3  | CORRECTION OF PATENT APPLICATION (COMPLETE REPRINT) PUBLISHED                                   | EFFECTIVE DATE : 19960117                                                                                                                                                                                |
| EP0692743 A4  | 19970212      | LSES        | +A4   | SUPPLEMENTARY SEARCH REPORT DRAWN UP AND DESPATCHED                                             |                                                                                                                                                                                                          |
| EP0692743 A4  | 19980114      | LSES        | +17Q  | FIRST EXAMINATION REPORT DESPATCHED                                                             | EFFECTIVE DATE : 19971201                                                                                                                                                                                |
| EP0692743 B1  | 19990915      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                            |                                                                                                                                                                                                          |
| EP0692743 B1  | 19991216      | LSLE        | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : DE<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 : 19991216 |
| EP0692743 B1  | 20000830      | LSGT        | +26N  | NO OPPOSITION FILED                                                                             |                                                                                                                                                                                                          |
| EP0692743 B1  | 20110729      | LSFE        | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM                                              | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20110323                                                                                                                                                  |

|              |          |      |       |                                                                                                 |                                                                                                                                                                                                                                                 |
|--------------|----------|------|-------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | NATIONAL OFFICE TO EPO]                                                                         | YEAR OF FEE PAYMENT : 18                                                                                                                                                                                                                        |
| EP0692743 B1 | 20121128 | LSLE | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                                   | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20120329                                                                                                                                                                                              |
| EP0692743 B1 | 20130131 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : GB<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20120329                                                                                                                      |
| EP0692743 B1 | 20140329 | PEXP |       | Calculated Patent Term Expiry                                                                   |                                                                                                                                                                                                                                                 |
| JP7076402 A2 | 19950320 | LSPB | +     | published / reissued                                                                            |                                                                                                                                                                                                                                                 |
| US5800954 A  | 19980901 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                            |                                                                                                                                                                                                                                                 |
| US5800954 A  | 20020207 | LSFE | +FPAY | FEE PAYMENT                                                                                     | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                         |
| US5800954 A  | 20060203 | LSFE | +FPAY | FEE PAYMENT                                                                                     | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                         |
| US5800954 A  | 20070215 | LSAS | AS    | ASSIGNMENT                                                                                      | PARTYTYPE : OWNER<br>OWNER : FUJIFILM CORPORATION, JAPAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:FUJIFILM HOLDINGS CORPORATION (FORMERLY FUJI PHOTO FILM CO., LTD.);<br>REEL/FRAME:018904/0001<br>EFFECTIVE DATE : 20070130 |
| US5800954 A  | 20070215 | LSAS | AS    | ASSIGNMENT                                                                                      | PARTYTYPE : OWNER<br>OWNER : FUJIFILM CORPORATION, JAPAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:FUJIFILM HOLDINGS CORPORATION (FORMERLY FUJI PHOTO FILM CO., LTD.);<br>REEL/FRAME:018904/0001<br>EFFECTIVE DATE : 20070130 |
| US5800954 A  | 20100901 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                                                       |                                                                                                                                                                                                                                                 |
| US5800954 A  | 20100927 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362                         |                                                                                                                                                                                                                                                 |
| US5800954 A  | 20100927 | LSLE | -STCH | INFORMATION ON STATUS: PATENT DISCONTINUATION                                                   | TEXT : PATENT EXPIRED DUE TO NONPAYMENT OF MAINTENANCE FEES UNDER 37 CFR 1.362                                                                                                                                                                  |
| US5800954 A  | 20101019 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                                                   | EFFECTIVE DATE : 20100901                                                                                                                                                                                                                       |
| US5800954 A  | 20170509 | PEXP |       | Calculated Patent Term Expiry                                                                   |                                                                                                                                                                                                                                                 |
| WO9423346 A1 | 19941013 | LSPB | +     | published / reissued                                                                            |                                                                                                                                                                                                                                                 |
| WO9423346 A1 | 19950825 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                                                     | REF DOCUMENT NUMBER : 1994910558<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                                                |
| WO9423346 A1 | 19950830 | LSNP | ENP   | ENTRY INTO THE NATIONAL PHASE IN:                                                               | REF DOCUMENT NUMBER : 1995505345<br>COUNTRY OF REF DOCUMENT : US<br>DATE OF REF DOCUMENT : 19950830<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) :                                                                                   |
| WO9423346 A1 | 19960117 | LSPB | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE                                                  | REF DOCUMENT NUMBER : 1994910558<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                                                |
| WO9423346 A1 | 19970509 | LSNP | ENP   | ENTRY INTO THE NATIONAL PHASE IN:                                                               | REF DOCUMENT NUMBER : 1997853411<br>COUNTRY OF REF DOCUMENT : US<br>DATE OF REF DOCUMENT : 19970509<br>KIND CODE OF REF DOCUMENT : A                                                                                                            |

| DESIGNATED STATE(S) : |          |      |      |                                                  |                                                                        |
|-----------------------|----------|------|------|--------------------------------------------------|------------------------------------------------------------------------|
| WO9423346 A1          | 19990915 | LSGT | +WWG | WIPO INFORMATION:<br>GRANT IN NATIONAL<br>OFFICE | REF DOCUMENT NUMBER :<br>1994910558<br>COUNTRY OF REF DOCUMENT :<br>EP |

**Title:** IMAGE FORMING UNIT AND IMAGE FORMING APPARATUS

**Abstract:** An image forming unit includes a developer collecting portion for collecting a developer, a developer conveying portion having a receiving portion and an exit portion. The image forming unit further includes a developer conveying unit that conveys the developer from the receiving portion to the exit portion. The developer conveying portion has a guide portion for guiding the developer conveying unit. One of the guide portion and the developer conveying portion has a contact portion that causes the guide portion and the developer conveying portion to partially contact each other in such a manner that a gap is partially formed therebetween.

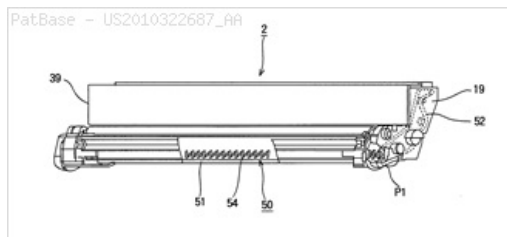
**Classifications:**

**International (IPC 8-9):** G03G21/00 G03G21/10  
G03G21/18 (Advanced/Invention)

**CPC:** G03G21/105 G03G21/1814

**European:** G03G21/10 G03G21/18C3

**US:** 399/358 399/358P 399/359

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN101930205 A      | 20101229         | CN201010219419     | 20100622         |
| CN101930205 B      | 20140409         | CN201010219419     | 20100622         |
| EP2267557 A1       | 20101229         | EP20100166764      | 20100622         |
| EP2267557 B1       | 20170215         | EP20100166764      | 20100622         |
| JP2011002789 A2    | 20110106         | JP20090148017      | 20090622         |
| JP4996652 B2       | 20120808         | JP20090148017      | 20090622         |
| US2010322687 AA    | 20101223         | US20100801674      | 20100621         |
| US8406679 BB       | 20130326         | US20100801674      | 20100621         |

**Priority:**

JP20090148017 20090622

**Probable Assignee:** OKI DATA CORP

**Assignee(s):** (std): NAKASONE YASUSHI ; OKI DATA KK

**Assignee(s):** OKI DATA CORP

**Inventor(s):** (std): YASUSHI NAKASONE ; NAKASONE YASUSHI

**Agent(s):** BETTEN AND RESCH; SHIMIZU MAMORU; RABIN AND BERDO PC; RABIN AND BERDO P C

**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)**

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| Patent        | Date recorded | Event group | Code  | Event                                | Details                                              |
|---------------|---------------|-------------|-------|--------------------------------------|------------------------------------------------------|
| CN101930205 A | 20101229      | LSPB        | +     | published / reissued                 |                                                      |
| CN101930205 A | 20101229      | LSPB        | +C06  | PUBLICATION                          |                                                      |
| CN101930205 B | 20140409      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                                                      |
| CN101930205 B | 20140409      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL     |                                                      |
| CN101930205 B | 20300622      | PEXP        |       | Calculated Patent Term Expiry        |                                                      |
| EP2267557 A1  | 20101229      | LSPB        | +     | published / reissued                 |                                                      |
| EP2267557 A1  | 20110810      | LSSES       | +17P  | REQUEST FOR EXAMINATION FILED        | EFFECTIVE DATE : 20110629                            |
| EP2267557 A1  | 20160413      | LSSES       | +17Q  | FIRST EXAMINATION REPORT DESPATCHED  | EFFECTIVE DATE : 20160311                            |
| EP2267557 A1  | 20161019      | LSGT        | +INTG | INTENTION TO GRANT ANNOUNCED         | EFFECTIVE DATE : 20160920                            |
| EP2267557 B1  | 20170215      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                                                      |
| EP2267557 B1  | 20170215      | LSNP        | REG   | REFERENCE TO A NATIONAL CODE         | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP   |
| EP2267557 B1  | 20170215      | LSGT        | REG   | REFERENCE TO A NATIONAL CODE         | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D |

|              |          |      |       |                                                                                                 |                                                                                                                                                                                                             |
|--------------|----------|------|-------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP2267557 B1 | 20170308 | LSGT | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : FG4D                                                                                                                                                        |
| EP2267557 B1 | 20170315 | LSNP | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : AT<br>REF LEGAL EVENT CODE : REF<br>REF DOCUMENT NUMBER : 868238<br>COUNTRY OF REF DOCUMENT : AT<br>KIND CODE OF REF DOCUMENT : T<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20170315  |
| EP2267557 B1 | 20170330 | LSPB | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R096<br>REF DOCUMENT NUMBER : 602010040060<br>COUNTRY OF REF DOCUMENT : DE                                                                                  |
| EP2267557 B1 | 20170511 | LSFE | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 8                                                                                                                             |
| EP2267557 B1 | 20170626 | LSRV | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : LT<br>REF LEGAL EVENT CODE : MG4D                                                                                                                                                        |
| EP2267557 B1 | 20170630 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : NL<br>PAYMENT DATE : 20170512<br>YEAR OF FEE PAYMENT : 8                                                                                                                          |
| EP2267557 B1 | 20170715 | LSRV | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : AT<br>REF LEGAL EVENT CODE : MK05<br>REF DOCUMENT NUMBER : 868238<br>COUNTRY OF REF DOCUMENT : AT<br>KIND CODE OF REF DOCUMENT : T<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20170215 |
| EP2267557 B1 | 20170731 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170215      |
| EP2267557 B1 | 20170731 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170515      |
| EP2267557 B1 | 20170731 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170215      |
| EP2267557 B1 | 20170731 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170516      |
| EP2267557 B1 | 20170731 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : HR<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 : 20170215      |

|              |          |      |       |                                                                                                 |                                                                                                                                                                                                        |
|--------------|----------|------|-------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP2267557 B1 | 20170731 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20170621<br>YEAR OF FEE PAYMENT : 8                                                                                                                     |
| EP2267557 B1 | 20170731 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20170511<br>YEAR OF FEE PAYMENT : 8                                                                                                                     |
| EP2267557 B1 | 20170731 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20170613<br>YEAR OF FEE PAYMENT : 8                                                                                                                     |
| EP2267557 B1 | 20170831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170215 |
| EP2267557 B1 | 20170831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170615 |
| EP2267557 B1 | 20170831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170215 |
| EP2267557 B1 | 20170831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170215 |
| EP2267557 B1 | 20170831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170215 |
| EP2267557 B1 | 20170831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : BG<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 : 20170515 |
| EP2267557 B1 | 20171031 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : RO<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 : 20170215 |
| EP2267557 B1 | 20171031 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : EE<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 : 20170215 |

|              |          |      |       |                                                                                                 |                                                                                                                                                                                                          |
|--------------|----------|------|-------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP2267557 B1 | 20171031 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170215 |
| EP2267557 B1 | 20171031 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170215 |
| EP2267557 B1 | 20171031 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170215 |
| EP2267557 B1 | 20171116 | LSRE | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R097<br>REF DOCUMENT NUMBER : 602010040060<br>COUNTRY OF REF DOCUMENT : DE                                                                               |
| EP2267557 B1 | 20171130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170215 |
| EP2267557 B1 | 20171130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : PL<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 : 20170215 |
| EP2267557 B1 | 20171130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : SM<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 : 20170215 |
| EP2267557 B1 | 20180124 | LSGT | +26N  | NO OPPOSITION FILED                                                                             | EFFECTIVE DATE : 20171116                                                                                                                                                                                |
| EP2267557 B1 | 20180131 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : MC<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 : 20170215 |
| EP2267557 B1 | 20180131 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                                       |
| EP2267557 B1 | 20180228 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL 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 : 20170215 |
| EP2267557 B1 | 20180321 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : MM4A                                                                                                                                                     |

|              |          |      |       |                                                                                                 |                                                                                                                                                                                                                             |
|--------------|----------|------|-------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP2267557 B1 | 20180430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : LI<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20170630                                                                                                  |
| EP2267557 B1 | 20180430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : LU<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20170622                                                                                                  |
| EP2267557 B1 | 20180430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : IE<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20170622                                                                                                  |
| EP2267557 B1 | 20180430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : CH<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20170630                                                                                                  |
| EP2267557 B1 | 20180511 | LSFE | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 9                                                                                                                                             |
| EP2267557 B1 | 20180731 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20180612<br>YEAR OF FEE PAYMENT : 9                                                                                                                                          |
| EP2267557 B1 | 20180831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : BE<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20170630                                                                                                  |
| EP2267557 B1 | 20180831 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20180511<br>YEAR OF FEE PAYMENT : 9                                                                                                                                          |
| EP2267557 B1 | 20180831 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : NL<br>PAYMENT DATE : 20180514<br>YEAR OF FEE PAYMENT : 9                                                                                                                                          |
| EP2267557 B1 | 20180928 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : MT<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20170622                                                                                                  |
| EP2267557 B1 | 20181031 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20180620<br>YEAR OF FEE PAYMENT : 9                                                                                                                                          |
| EP2267557 B1 | 20190628 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : HU<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; INVALID AB INITIO<br>LAPSED DATE : 20100622 |
| EP2267557 B1 | 20190628 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : NL<br>PAYMENT DATE : 20190515<br>YEAR OF FEE PAYMENT : 10                                                                                                                                         |
| EP2267557 B1 | 20190731 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20190612<br>YEAR OF FEE PAYMENT : 10                                                                                                                                         |
| EP2267557 B1 | 20300622 | PEXP |       | Calculated Patent Term Expiry                                                                   |                                                                                                                                                                                                                             |

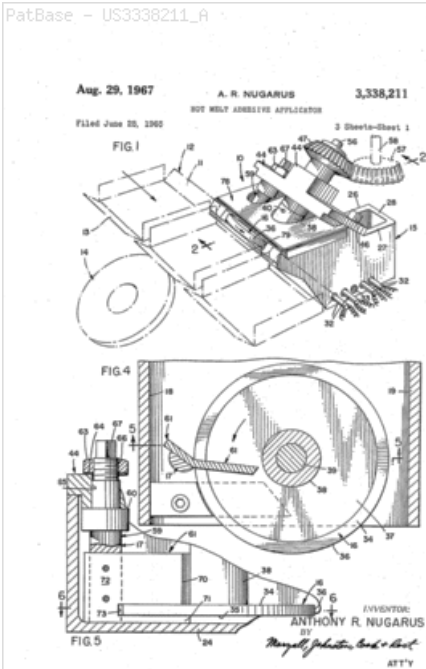
|                 |          |       |       |                                                                                              |                                                                         |
|-----------------|----------|-------|-------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| JP2011002789 A2 | 20110106 | LSPB  | +     | published /<br>reissued                                                                      |                                                                         |
| JP2011002789 A2 | 20110316 | LSSES | +A621 | WRITTEN REQUEST<br>FOR APPLICATION<br>EXAMINATION                                            | TEXT : JAPANESE INTERMEDIATE<br>CODE: A621<br>EFFECTIVE DATE : 20110315 |
| JP2011002789 A2 | 20110429 | LSRE  | A521  | WRITTEN<br>AMENDMENT                                                                         | TEXT : JAPANESE INTERMEDIATE<br>CODE: A523<br>EFFECTIVE DATE : 20110428 |
| JP2011002789 A2 | 20110823 | LSSES | -A131 | NOTIFICATION OF<br>REASONS FOR<br>REFUSAL                                                    | TEXT : JAPANESE INTERMEDIATE<br>CODE: A131<br>EFFECTIVE DATE : 20110823 |
| JP2011002789 A2 | 20111022 | LSRE  | A521  | WRITTEN<br>AMENDMENT                                                                         | TEXT : JAPANESE INTERMEDIATE<br>CODE: A523<br>EFFECTIVE DATE : 20111021 |
| JP2011002789 A2 | 20111206 | LSSES | -A131 | NOTIFICATION OF<br>REASONS FOR<br>REFUSAL                                                    | TEXT : JAPANESE INTERMEDIATE<br>CODE: A131<br>EFFECTIVE DATE : 20111206 |
| JP2011002789 A2 | 20120203 | LSRE  | A521  | WRITTEN<br>AMENDMENT                                                                         | TEXT : JAPANESE INTERMEDIATE<br>CODE: A523<br>EFFECTIVE DATE : 20120202 |
| JP2011002789 A2 | 20120406 | LSGT  | +TRDD | DECISION OF<br>GRANT OR<br>REJECTION<br>WRITTEN                                              |                                                                         |
| JP2011002789 A2 | 20120417 | LSGT  | +A01  | WRITTEN DECISION<br>TO GRANT A<br>PATENT OR TO<br>GRANT A<br>REGISTRATION<br>(UTILITY MODEL) | TEXT : JAPANESE INTERMEDIATE<br>CODE: A01<br>EFFECTIVE DATE : 20120417  |
| JP2011002789 A2 | 20120419 | LSGT  | +A01  | WRITTEN DECISION<br>TO GRANT A<br>PATENT OR TO<br>GRANT A<br>REGISTRATION<br>(UTILITY MODEL) | TEXT : JAPANESE INTERMEDIATE<br>CODE: A01                               |
| JP2011002789 A2 | 20120517 | LSFE  | +A61  | FIRST PAYMENT OF<br>ANNUAL FEES<br>(DURING GRANT<br>PROCEDURE)                               | TEXT : JAPANESE INTERMEDIATE<br>CODE: A61<br>EFFECTIVE DATE : 20120511  |
| JP2011002789 A2 | 20120518 | LSFE  | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE)                     | YEAR OF FEE PAYMENT : 3                                                 |
| JP2011002789 A2 | 20120518 | LSGT  | +R150 | CERTIFICATE OF<br>PATENT OR<br>REGISTRATION OF<br>UTILITY MODEL                              | TEXT : JAPANESE INTERMEDIATE<br>CODE: R150                              |
| JP4996652 B2    | 20120808 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                   |                                                                         |
| JP4996652 B2    | 20120515 | LSFE  | R100  | 特許料納付書 (Patent<br>fee payment form)                                                          |                                                                         |
| JP4996652 B2    | 20150409 | LSFE  | R20   | 特許料納付書 (Patent<br>fee payment form)                                                          |                                                                         |
| JP4996652 B2    | 20150414 | LSFE  | R2501 | 年金領収書 (一括)<br>(Pension receipt<br>(bulk))                                                    |                                                                         |
| JP4996652 B2    | 20160407 | LSFE  | R20   | 特許料納付書 (Patent<br>fee payment form)                                                          |                                                                         |
| JP4996652 B2    | 20160419 | LSFE  | R2501 | 年金領収書 (一括)<br>(Pension receipt<br>(bulk))                                                    |                                                                         |
| JP4996652 B2    | 20170406 | LSFE  | R20   | 特許料納付書 (Patent<br>fee payment form)                                                          |                                                                         |
| JP4996652 B2    | 20170411 | LSFE  | R2501 | 年金領収書 (一括)<br>(Pension receipt<br>(bulk))                                                    |                                                                         |
| JP4996652 B2    | 20180405 | LSFE  | R20   | 特許料納付書 (Patent<br>fee payment form)                                                          |                                                                         |
| JP4996652 B2    | 20180410 | LSFE  | R2501 | 年金領収書 (一括)<br>(Pension receipt<br>(bulk))                                                    |                                                                         |
| JP4996652 B2    | 20190411 | LSFE  | R20   | 特許料納付書 (Patent<br>fee payment form)                                                          |                                                                         |
| JP4996652 B2    | 20190416 | LSFE  | R2501 | 年金領収書 (一括)<br>(Pension receipt)                                                              |                                                                         |

|                 |          |      |       |                                                    |                                                                                                                                                                                                    |
|-----------------|----------|------|-------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP4996652 B2    | 20290622 | PEXP |       | (bulk))<br>Calculated Patent<br>Term Expiry        |                                                                                                                                                                                                    |
| US2010322687 AA | 20101223 | LSPB | +     | published /<br>reissued                            |                                                                                                                                                                                                    |
| US2010322687 AA | 20130306 | LSGT | STCF  | INFORMATION ON<br>STATUS: PATENT<br>GRANT          | TEXT : PATENTED CASE                                                                                                                                                                               |
| US8406679 BB    | 20130326 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)         |                                                                                                                                                                                                    |
| US8406679 BB    | 20100621 | LSAS | AS    | ASSIGNMENT                                         | PARTYTYPE : OWNER<br>OWNER : OKI DATA<br>CORPORATION, JAPAN<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:NAKASONE, YASUSHI;<br>REEL/FRA:024641/0986<br>EFFECTIVE DATE : 20100609 |
| US8406679 BB    | 20130306 | LSGT | PAT1  | Patented Case                                      |                                                                                                                                                                                                    |
| US8406679 BB    | 20160915 | LSFE | +FPAY | FEE PAYMENT                                        | YEAR OF FEE PAYMENT : 4                                                                                                                                                                            |
| US8406679 BB    | 20310708 | PEXP |       | Calculated Patent<br>Term Expiry (PTA<br>382 days) |                                                                                                                                                                                                    |

**Title:** HOT MELT ADHESIVE APPLICATOR

**Abstract:** (Claim 1) 1. A hot melt adhesive applicator for applying an adhesive coating of predetermined thickness to a carton flap, said applicator comprising, a tank for holding a supply of **molten** hot melt adhesive, said tank including a bottom wall, vertical parallel opposed side walls, a rear vertical wall extending normal to the side walls, and a front wall having a lower section extending from the bottom wall and making an obtuse angle therewith, and an upper section extending angularly from the lower section away from the rear wall, a cross bar extending between the opposed side walls of the tank and parallel to said upper section, a bracket removably mounted on said cross bar, an application roller rotatably mounted on said cross bar having a portion extending deeply into the tank for immersion in a supply of adhesive and a portion extending outside of the tank beyond said upper section for engaging carton flaps, and a doctor blade and scraper unit mounted on said bracket for controlling the adhesive thickness on the roller to be applied to the carton flaps and for removing adhesive from other parts of the roller

**Classifications:**  
**International (IPC 8-9):** B31B1/62 B31B50/62 (Advanced/Invention); B31B1/60 (Core/Invention)  
**International (IPC 1-7):** B31B3/60  
**CPC:** B31B50/00 B31B50/624  
**European:** B31B1/62 L31B201/60B2  
**US:** 118/202 118/261



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US3338211 A        | 19670829         | US19650467047      | 19650625         |

**Priority:**  
US19650467047 19650625

**Probable Assignee:** CROMPTON AND KNOWLES CORP  
**Assignee(s):** (std): CROMPTON AND KNOWLES CORP  
**Inventor(s):** (std): NUGARUS ANTHONY R

**Legal status (INPADOC)**

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| Patent      | Date recorded | Event group | Code | Event                                | Details |
|-------------|---------------|-------------|------|--------------------------------------|---------|
| US3338211 A | 19670829      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| US3338211 A | 19850625      | PEXP        |      | Calculated Patent Term Expiry        |         |

**Title:** SELF-RECOVERABLE COVERING MATERIAL AND METHOD FOR FABRICATING THE SAME

**Abstract:** The surface of a member formed of at least one kind of ceramics, metals and C/C composites, is covered with an outermost surface oxide covering layer having a stability against the environment in the atmospheric air at 1500 DEG C.; and a self-recoverable layer as an intermediate layer formed between the outermost surface oxide covering layer and the surface of the member. The self-recoverable layer has an oxidizing rate greater than that of the outermost surface covering layer for recovering cracks generated on the outermost surface covering layer, and a compound produced by the self-recoverable layer has the same phase as in the outermost surface covering layer. To achieve the optimum self-recovering function at high temperatures, the outermost surface oxide covering layer may be made of a stable oxide having a vapor pressure of  $1 \times 10^{-4}$  m2 or less in the atmospheric air at 1500 DEG C., and the oxidized product material from the self-recoverable layer contains an oxide having the same composition as that of the outermost surface oxide covering layer.

**Classifications:**

**International (IPC 8-9):** C04B41/45 C04B41/52 C04B41/81 C04B41/89 C23C16/38 C23C16/50 C23C26/00 C23C30/00 C23C4/02 C23C4/10 (Advanced/Invention); C04B37/00 (Advanced/Non-invention)

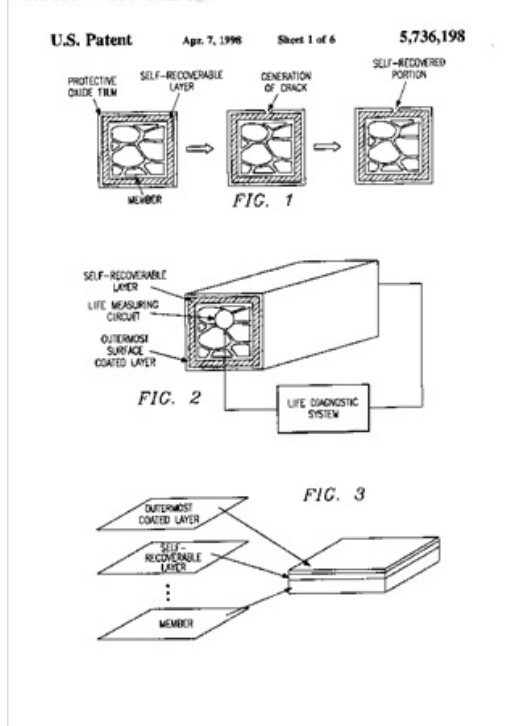
**International (IPC 1-7):** B05D1/36 C04B35/52 C04B35/577 C04B35/596 C04B37/00 C04B41/85 C04B41/89 C23C16/50 C23C4/06 C23C4/10

**CPC:** F16C2240/64 C04B41/009 C04B41/4558 C04B41/52 C04B41/81 C04B41/89 C04B2111/00405 C23C4/02 C23C16/38 C23C30/00

**European:** C04B41/00V C04B41/45B20S C04B41/52 C04B41/81 C04B41/89 C23C16/38 C23C30/00 C23C4/02 M04B111/00P34

**US:** 427/140 427/142 427/419.2 427/419.3 427/419.7

PatBase - US5736198\_A

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE4433514 A1       | 19950323         | DE19944433514      | 19940920         |
| DE4433514 C2       | 19970116         | DE19944433514      | 19940920         |
| JP7089779 A2       | 19950404         | JP19930255197      | 19930920         |
| KR19950008431 A    | 19950417         | KR19940023792      | 19940917         |
| KR950008431 A      | 19950417         | KR19940023792      | 19940917         |
| TW293849 B         | 19961221         | TW19940108048      | 19940901         |
| US5736198 A        | 19980407         | US19950557960      | 19951113         |

**Priority:**

JP19930255197 19930920 US19940309149 19940920 US19950557960 19951113

**Probable Assignee:** HITACHI LTD

**Assignee(s):** (std): HITACHI LTD

**Assignee(s):** HITACHI SEISAKUSHO KK

**Inventor(s):** (std): NAKAGAWA MOROO ; MIYATA MOTOYUKI ; NAKAGAWA MITSUO ; SAITO YUKIO ; KIKUCHI SHIGERU ; YASUTOMI YOSHIYUKI

**Inventor(s):** MIYATA MOTOYUKI HITACHI IBARAKI JP ; NAKAGAWA MITSUO MITO IBARAKI JP ; SAITO YUKIO HITACHI IBARAKI JP ; KIKUCHI SHIGERU IBARAKI JP ; YASUTOMI YOSHIYUKI MITO IBARAKI JP

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code  | Event                                                 | Details |
|--------------|---------------|-------------|-------|-------------------------------------------------------|---------|
| DE4433514 A1 | 19950323      | LSPB        | +     | published / reissued                                  |         |
| DE4433514 A1 | 19950323      | LSSES       | +OP8  | REQUEST FOR EXAMINATION AS TO PARAGRAPH 44 PATENT LAW |         |
| DE4433514 C2 | 19970116      | LSGT        | +     | granted / extensions (spc, cpc, pte)                  |         |
| DE4433514 C2 | 19970116      | LSGT        | +D2   | GRANT AFTER EXAMINATION                               |         |
| DE4433514 C2 | 19970710      | LSGT        | +8364 | NO OPPOSITION                                         |         |

|                 |          |      |       |                                                                                  |                                                                                         |
|-----------------|----------|------|-------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
|                 |          |      |       | DURING TERM OF<br>OPPOSITION                                                     |                                                                                         |
| DE4433514 C2    | 20011011 | LSLE | -8339 | CEASED/NON-PAYMENT<br>OF THE ANNUAL FEE                                          |                                                                                         |
| DE4433514 C2    | 20140920 | PEXP |       | Calculated Patent Term<br>Expiry                                                 |                                                                                         |
| JP7089779 A2    | 19950404 | LSPB | +     | published / reissued                                                             |                                                                                         |
| KR19950008431 A | 19950417 | LSPB | +     | published / reissued                                                             |                                                                                         |
| KR950008431 A   | 19950417 | LSPB | +     | published / reissued                                                             |                                                                                         |
| KR950008431 A   | 19991130 | LSDW | -WITN | WITHDRAWAL DUE TO<br>NO REQUEST FOR<br>EXAMINATION                               |                                                                                         |
| TW293849 B      | 19961221 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                          |                                                                                         |
| TW293849 B      | 20140901 | PEXP |       | Calculated Patent Term<br>Expiry                                                 |                                                                                         |
| US5736198 A     | 19980407 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                          |                                                                                         |
| US5736198 A     | 20020408 | LSLE | -LAPS | LAPSE FOR FAILURE TO<br>PAY MAINTENANCE FEES                                     |                                                                                         |
| US5736198 A     | 20020507 | LSLE | -PEX1 | Patent Expired Due to<br>NonPayment of<br>Maintenance Fees Under<br>37 CFR 1.362 |                                                                                         |
| US5736198 A     | 20020507 | LSLE | -STCH | INFORMATION ON<br>STATUS: PATENT<br>DISCONTINUATION                              | TEXT : PATENT EXPIRED DUE<br>TO NONPAYMENT OF<br>MAINTENANCE FEES UNDER<br>37 CFR 1.362 |
| US5736198 A     | 20020604 | LSLE | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE                              | EFFECTIVE DATE : 20020407                                                               |
| US5736198 A     | 20151113 | PEXP |       | Calculated Patent Term<br>Expiry                                                 |                                                                                         |

**Title:** Husking roll assembly with cutter element

**Abstract:** A roll assembly for a husking machine of the type using cooperating roll assemblies to exert a husking or stripping action on a food article being processed. A cutter element is carried in a recessed manner within aligned recesses in roll segment lands. The cutter element may be detachable or cast in place within the roll segment. The roll segments may be of resilient or non-resilient material with their cooperating roll segments being of like or unlike material.

**Classifications:**

**International (IPC 8-9):** A01D82/00 A01F11/06 (Advanced/Invention);  
A01D82/00 A01F11/00 (Core/Invention)

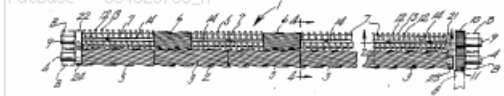
**International (IPC 1-7):** A01D45/02

**CPC:** A01D82/00 A01F11/06

**European:** A01D82/00 A01F11/06

**US:** 460/32 460/38 56/104 56/110 56/117

PatBase - US4625735\_A



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US4625735 A        | 19861202         | US19850689095      | 19850107         |

**Priority:**

US19850689095 19850107

**Probable Assignee:** ANDERSON RONALD L

**Assignee(s):** (std): ANDERSON RONALD L ; KESSLER JR HARRY T

**Inventor(s):** (std): ANDERSON RONALD L ; KESSLER JR HARRY T

**Legal status (INPADOC)**

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| Patent      | Date recorded | Event group | Code  | Event                                | Details                  |
|-------------|---------------|-------------|-------|--------------------------------------|--------------------------|
| US4625735 A | 19861202      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                          |
| US4625735 A | 19860930      | LSGT        | PAT1  | Patented Case                        |                          |
| US4625735 A | 19860930      | LSGT        | STCF  | INFORMATION ON STATUS: PATENT GRANT  | TEXT : PATENTED CASE     |
| US4625735 A | 19900802      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4  |
| US4625735 A | 19931227      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8  |
| US4625735 A | 19980422      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12 |

**Title:** THERMAL SPRAY GRIT ROLLER

**Abstract:** A thermal spray grit roller includes a **roller shaft** having an outer periphery and a roller body connected to the outer periphery of the **roller shaft**. A grit layer comprising a multiple individual grit particles is deposited on the circumferential outer surface of the roller body by a thermal spray process. A method for manufacturing the thermal spray grit roller includes collecting raw materials for use in the method, including at least one roller subassembly, having a roller body connected to a **roller shaft**, and the application material. The outer surface of each roller body is degreased. Then, any portion of the roller body outer surface that will not be covered by the grit layer is masked. Finally, the grit layer is formed on the roller body outer surface with a thermal spray process.

**Classifications:**

**International (IPC 8-9):** B05D B05D1/10 B21B1/40 B41J B41J13/02 B65H27/00 B65H5/06 C23C E01C19/23 G03G15/00 (Advanced/Invention); B05D1/08 B21B1/00 B41J13/02 B65H27/00 B65H5/06 E01C19/22 G03G15/00 (Core/Invention)

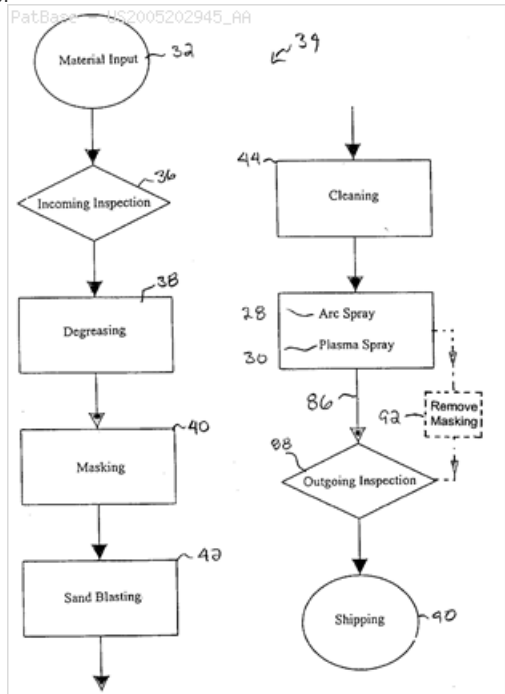
**International (IPC 1-7):** B05D1/10 B21B1/40 B41J13/02 B65H27/00 B65H5/06 E01C19/23 G03G15/00

**CPC:** Y10T29/49563 B65H27/00 B65H2401/12 B65H2402/80 B65H2404/5212 B65H2404/5331 B65H2801/06 G03G2215/00683 C23C4/134

**European:** B65H27/00 C23C4/12L L65H401/12 L65H402/80

L65H404/5212 L65H404/5331 L65H801/06 S03G215/00G3Q1

**US:** 29/895.32 29/895.320S 492/37 492/37P



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN100445189 C      | 20081224         | CN200510055003     | 20050311         |
| CN1666942 A        | 20050914         | CN200510055003     | 20050311         |
| HK1080676 A2       | 20060630         | HK20050102077      | 20050310         |
| JP2005255415 A2    | 20050922         | JP20050066907      | 20050310         |
| US2005202945 AA    | 20050915         | US20040798467      | 20040311         |

**Priority:**

US20040798467 20040311

**Probable Assignee:** NAM WAH DEV LTD

**Assignee(s):** (std): NAM WAH DEV LTD ; NANHUA DEV HONGKONG CORP

**Assignee(s):** LEUNG CHI K ; NAM WAH DEVELOPMENT LIMITED ; NAM WAH DEVELOPMENT LTD ; NANHUA DEV CORP

**Inventor(s):** (std): LEONG CHEE KONG ; LEUNG CHI K ; LEUNG CHI KONG

**Inventor(s):** LEUNG CHI ; CHI KONG LEUNG

**Agent(s):** MARKS AND CLERK; ALIX YALE AND RISTAS LLP

**Legal status (INPADOC)**

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| Patent        | Date recorded | Event group | Code  | Event                                                        | Details                   |
|---------------|---------------|-------------|-------|--------------------------------------------------------------|---------------------------|
| CN100445189 C | 20081224      | LSGT        | +     | granted / extensions (spc, cpc, pte)                         |                           |
| CN100445189 C | 20081224      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL                             |                           |
| CN100445189 C | 20180330      | LSLE        | -CF01 | TERMINATION OF PATENT RIGHT DUE TO NON-PAYMENT OF ANNUAL FEE |                           |
| CN100445189 C | 20250311      | PEXP        |       | Calculated Patent Term Expiry                                |                           |
| CN1666942 A   | 20050914      | LSPB        | +     | published / reissued                                         |                           |
| CN1666942 A   | 20050914      | LSPB        | +C06  | PUBLICATION                                                  |                           |
| HK1080676 A2  | 20060630      | LSGT        | +     | granted / extensions (spc, cpc, pte)                         |                           |
| HK1080676 A2  | 20130322      | LSLE        | -PEU  | SHORT-TERM PATENTS EXPIRED                                   | EFFECTIVE DATE : 20130309 |

|                 |          |      |       |                                                     |                                                                      |
|-----------------|----------|------|-------|-----------------------------------------------------|----------------------------------------------------------------------|
| HK1080676 A2    | 20130310 | PEXP |       | Calculated Patent Term Expiry                       |                                                                      |
| JP2005255415 A2 | 20050922 | LSPB | +     | published / reissued                                |                                                                      |
| JP2005255415 A2 | 20070619 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                 | TEXT : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20070619 |
| JP2005255415 A2 | 20080304 | LSRV | -A02  | DECISION OF REFUSAL                                 | TEXT : JAPANESE INTERMEDIATE CODE: A02<br>EFFECTIVE DATE : 20080304  |
| US2005202945 AA | 20050915 | LSPB | +     | published / reissued                                |                                                                      |
| US2005202945 AA | 20080331 | LSWD | -ABD3 | Abandoned -- Failure to Respond to an Office Action |                                                                      |

**Title:** SINK ROLL BEARING HAVING CERAMIC ELEMENTS FOR SUPPORTING THE ROLL'S SHAFT

**Abstract:** A bearing for supporting a shaft submerged in **molten** zinc, has a bearing surface comprising a steel cylindrical liner having slots retaining ceramic shaft-engaging bearing elements.

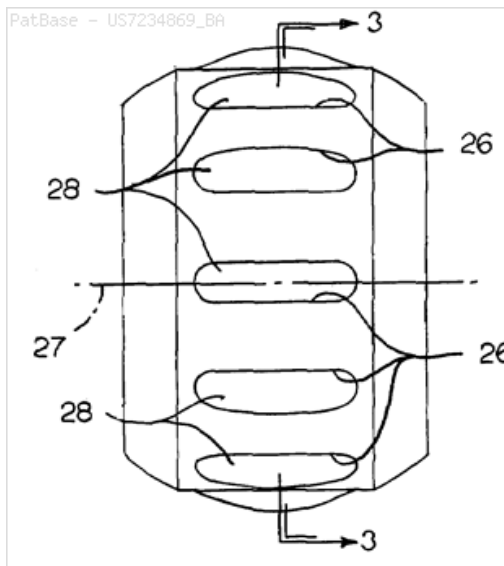
**Classifications:**

**International (IPC 8-9):** F16C17/02 F16C17/12 F16C23/04  
F16C33/02 F16C33/12 F16C33/14 F16C33/24 F16C33/32 F16C33/62  
F16C33/64 (Advanced/Invention);  
F16C17/02 F16C33/02 F16C33/30 F16C33/58  
F16C33/62 (Core/Invention)

**CPC:** F16C23/04 F16C33/043 F16C33/24

**European:** F16C23/04 F16C33/04C F16C33/24

**US:** 384/282 384/283 384/297 384/302



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU2007212176 AA    | 20070816         | AU20070212176      | 20070131         |
| BRPI0706907 A2     | 20110510         | BR2007PI06907      | 20070131         |
| CA2640172 AA       | 20080724         | CA20072640172      | 20070131         |
| EP1984639 A2       | 20081029         | EP20070710414      | 20070131         |
| JP2009526174 T2    | 20090716         | JP20080553470T     | 20070131         |
| KR20080103985 A    | 20081128         | KR200807021535     | 20070131         |
| MX2008009753 A1    | 20090210         | MX20080009753      | 20070131         |
| US7234869 BA       | 20070626         | US20060345774      | 20060202         |
| WO07092712 A2      | 20070816         | WO2007US61349      | 20070131         |
| WO07092712 A3      | 20080124         | WO2007US61349      | 20070131         |

**Priority:**

US20060345774 20060202 WO2007US61349 20070131

**Probable Assignee:** ALPHATECH INC

**Assignee(s):** (std): ALPHATECH INC ; MORANDO JORGE

**Inventor(s):** (std): MORANDO JORGE ; MORANDO JORGE A

**Inventor(s):** JORGE MORANDO

**Agent(s):** SHELSTON IP; SHELSTON IP PTY LTD; BORDEN LADNER GERVAIS LLP; MILLER JAMES LIONEL WOOLVERTON ET AL; CHARLES W

**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 MC 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)**

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| Patent          | Date recorded | Event group | Code  | Event                                                                                                    | Details |
|-----------------|---------------|-------------|-------|----------------------------------------------------------------------------------------------------------|---------|
| AU2007212176 AA | 20070816      | LSPB        | +     | published / reissued                                                                                     |         |
| AU2007212176 AA | 20120823      | LSLE        | -MK4  | APPLICATION LAPSED SECTION 142(2)(D) - NO CONTINUATION FEE PAID FOR THE APPLICATION                      |         |
| BRPI0706907 A2  | 20120403      | LSRV        | -B11A | DISMISSAL ACC. ART.33 OF IPL - EXAMINATION NOT REQUESTED WITHIN 36 MONTHS OF FILING                      |         |
| BRPI0706907 A2  | 20120731      | LSRV        | -B11Y | DEFINITIVE DISMISSAL ACC. ARTICLE 33 OF IPL - EXTENSION OF TIME LIMIT FOR REQUEST OF EXAMINATION EXPIRED |         |
| CA2640172 AA    | 20080724      | LSPB        | +     | published / reissued                                                                                     |         |
| CA2640172 AA    | 20110131      | LSLE        | -FZDE | DEAD                                                                                                     |         |
| EP1984639 A2    | 20081029      | LSPB        | +     | published / reissued                                                                                     |         |

|                 |          |       |       |                                                                         |                                                                                                                                                                                              |
|-----------------|----------|-------|-------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1984639 A2    | 20081029 | LSSES | +17P  | REQUEST FOR EXAMINATION FILED                                           | EFFECTIVE DATE : 20080819                                                                                                                                                                    |
| EP1984639 A2    | 20110216 | LSDW  | -18D  | APPLICATION DEEMED TO BE WITHDRAWN                                      | EFFECTIVE DATE : 20100803                                                                                                                                                                    |
| JP2009526174 T2 | 20090716 | LSPB  | +     | published / reissued                                                    |                                                                                                                                                                                              |
| KR20080103985 A | 20081128 | LSPB  | +     | published / reissued                                                    |                                                                                                                                                                                              |
| KR20080103985 A | 20120327 | LSDW  | -WITN | WITHDRAWAL DUE TO NO REQUEST FOR EXAMINATION                            |                                                                                                                                                                                              |
| MX2008009753 A1 | 20090210 | LSPB  | +     | published / reissued                                                    |                                                                                                                                                                                              |
| MX2008009753 A1 | 20100831 | LSRE  | HH    | CORRECTION OR CHANGE IN GENERAL                                         |                                                                                                                                                                                              |
| MX2008009753 A1 | 20150731 | LSWD  | -FA   | ABANDONMENT OR WITHDRAWAL                                               |                                                                                                                                                                                              |
| US7234869 BA    | 20070626 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                              |
| US7234869 BA    | 20060315 | LSAS  | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : ALPHATECH, INC., MICHIGAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:MORANDO, JORGE A.;<br>REEL/FRAME:017308/0253<br>EFFECTIVE DATE : 20060303 |
| US7234869 BA    | 20110626 | LSLE  | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                                                                                                                                                                                              |
| US7234869 BA    | 20110725 | LSLE  | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                                                                                                                                              |
| US7234869 BA    | 20110725 | LSLE  | -STCH | INFORMATION ON STATUS: PATENT DISCONTINUATION                           | TEXT : PATENT EXPIRED DUE TO NONPAYMENT OF MAINTENANCE FEES UNDER 37 CFR 1.362                                                                                                               |
| US7234869 BA    | 20110816 | LSLE  | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20110626                                                                                                                                                                    |
| US7234869 BA    | 20260305 | PEXP  |       | Calculated Patent Term Expiry (PTA 31 days)                             |                                                                                                                                                                                              |
| WO07092712 A2   | 20070816 | LSPB  | +     | published / reissued                                                    |                                                                                                                                                                                              |
| WO07092712 A3   | 20080723 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                             | REF DOCUMENT NUMBER : 2007212176<br>COUNTRY OF REF DOCUMENT : AU                                                                                                                             |
| WO07092712 A3   | 20080724 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                             | REF DOCUMENT NUMBER : 2640172<br>COUNTRY OF REF DOCUMENT : CA                                                                                                                                |
| WO07092712 A3   | 20080729 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                             | REF DOCUMENT NUMBER : 2008553470<br>COUNTRY OF REF DOCUMENT : JP                                                                                                                             |
| WO07092712 A3   | 20080730 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                             | REF DOCUMENT NUMBER : MX/A/2008/009753<br>COUNTRY OF REF DOCUMENT : MX                                                                                                                       |
| WO07092712 A3   | 20080805 | LSNE  | NENP  | NON-ENTRY INTO THE NATIONAL PHASE IN:                                   | REF COUNTRY CODE : DE                                                                                                                                                                        |
| WO07092712 A3   | 20080819 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                             | REF DOCUMENT NUMBER : 2007710414<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                             |
| WO07092712 A3   | 20080821 | LSNP  | ENP   | ENTRY INTO THE NATIONAL PHASE IN:                                       | REF DOCUMENT NUMBER : 2007212176<br>COUNTRY OF REF DOCUMENT : AU<br>DATE OF REF DOCUMENT : 20070131<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) :                                |
| WO07092712 A3   | 20080902 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL                                   | REF DOCUMENT NUMBER : 1020087021535                                                                                                                                                          |

|               |          |      |     | PHASE                                | COUNTRY OF REF<br>DOCUMENT : KR                                                                                                                                     |
|---------------|----------|------|-----|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WO07092712 A3 | 20110510 | LSNP | ENP | ENTRY INTO THE<br>NATIONAL PHASE IN: | REF DOCUMENT NUMBER :<br>PI0706907<br>COUNTRY OF REF<br>DOCUMENT : BR<br>KIND CODE OF REF<br>DOCUMENT : A2<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE :<br>20080801 |

**Title:** ALLOY POWDER RAW MATERIAL AND ITS MANUFACTURING METHOD

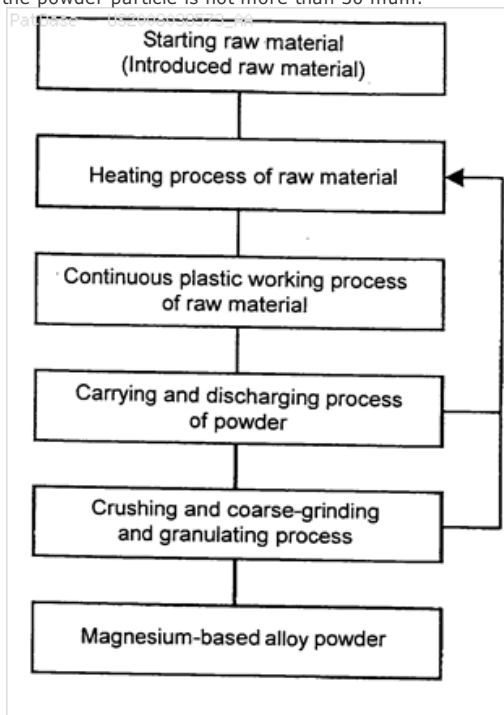
**Abstract:** When starting raw material powder is passed through a pair of rolls (2 a), plastic working is applied to the starting raw material powder, and the crystal grain diameter of a metal or alloy constituting a matrix of the powder particle after processed is miniaturized. According to the thus provided alloy powder raw material, the maximum size of the powder particle is not more than 10 mm and the minimum size of the powder particle is not less than 0.1 mm, and the maximum crystal grain diameter of the metal or alloy constituting the matrix of the powder particle is not more than 30 μm.

**Classifications:**

**International (IPC 8-9):** B02C11/08 B22F1/00 B22F9/04 C22C1/04 C22C23/02 C22F1/06 (Advanced/Invention); B22F9/04 C22F1/00 (Advanced/Non-invention); B02C11/00 B22F1/00 B22F9/02 C22C1/04 C22C23/00 C22F1/06 (Core/Invention); C22F1/00 (Core/Non-invention)

**International (IPC 1-7):** B22F1/00 B22F9/04 C22C1/04 C22C23/02  
**CPC:** Y10T428/12014 C22C23/00 B22F1/0011 B22F2009/047 B22F2998/10 B22F9/04

**European:** B22F1/00A2B B22F9/04 C22C23/00 L22F9/04P6  
**US:** 148/513 241/23 241/23S 428/546 428/546P 75/710



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN100553826 C      | 20091028         | CN200480042439     | 20040521         |
| CN1942267 A        | 20070404         | CN200480042439     | 20040521         |
| EP1726385 A1       | 20061129         | EP20040745278      | 20040521         |
| EP1726385 A4       | 20090527         | EP20040745278      | 20040521         |
| JP2005256133 A2    | 20050922         | JP20040072411      | 20040315         |
| JP2006152446 A2    | 20060615         | JP20060022016      | 20060131         |
| JP3884741 B2       | 20070221         | JP20040072411      | 20040315         |
| KR20060135813 A    | 20061229         | KR20067018751      | 20040521         |
| US2008038573 AA    | 20080214         | US20040592877      | 20040521         |
| US7909948 BB       | 20110322         | US20040592877      | 20040521         |
| WO05087410 A1      | 20050922         | WO2004JP06967      | 20040521         |

**Priority:**

JP20040072411 20040315 WO2004JP06967 20040521 JP20060022016 20060131

**Probable Assignee:** GOHSYU CO LTD

**Assignee(s):** (std): KONDOH KATSUYOSHI ; GOHSYU CO LTD ; GOTO MITSUHIRO ; ITAKURA KATSUHITO ; KONDO KATSUYOSHI ; GOOSHUU KK ; AGATA HAJIME ; FUKUI HIDEAKI ; FUKUMOTO KAZUNORI ; GOHSHU CO LTD ; KONDOH KATSUYOSHI GOHSYU CO LT ; KURIMOTO LTD ; SHIOZAKI SHUJI

**Assignee(s):** KONDOH KATSUYOSHI GOHSYU CO LTD ; GOHSYU CO ; GOHSHU CO ; KONDOH KATSUYOSHI ; KURIMOTO LTD ; KONDOH KATSUYOSHI GOHSYU CO

**Inventor(s):** (std): KONDOH KATSUYOSHI ; GOTO MITSUHIRO ; FUKUI HIDEAKI ; SHIOZAKI SHUJI ; AGATA HAJIME ; ITAKURA KATSUHITO ; FUKUMOTO KAZUNORI ; KONDO KATSUYOSHI ; ITAKURA KATSUTO ; SHUJI SHIOZAKI ; HAJIME AGATA ; KATSUYOSHI KONDOH ; HIDEAKI FUKUI ; KATSUHITO ITAKURA ; KAZUNORI FUKUMOTO ; MITSUHIRO GOTO ; FUKUMOTO KONDOH KATSUYOSHI GOTO

**Inventor(s):** KONDOH KATSUYOSHI GOTO MITSUHIRO FUKUI HIDEAKI ; KONDOH KATSUYOSHI GOTO MITSUHIRO FUKUI HIDEAKI SHIOZAKI SHUJI AGATA HAJIME ITAKURA KATSUHITO FUKUMOTO KAZUNORI ; KONDOH KATSUYOSHI GOTO MITSUHIRO FUKUI HIDEAKI SHI

**Agent(s):** ITOH HIDEHIKO ; YOSHIDA HIROYOSHI ; MORISHITA HACHIRO ; CLARK AND BRODY

**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 KE KG KP KR KZ LC LI 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)**

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

CN100553826 C 20091028 LSGT + granted /

|                 |          |       |       |                                                                 |                                                                      |
|-----------------|----------|-------|-------|-----------------------------------------------------------------|----------------------------------------------------------------------|
| CN100553826 C   | 20091028 | LSGT  | +C14  | extensions (spc, cpc, pte)<br>GRANT OF PATENT OR UTILITY MODEL  |                                                                      |
| CN100553826 C   | 20130710 | LSLE  | -C17  | CESSATION OF PATENT RIGHT                                       |                                                                      |
| CN100553826 C   | 20240521 | PEXP  |       | Calculated Patent Term Expiry                                   |                                                                      |
| CN1942267 A     | 20070404 | LSPB  | +     | published / reissued                                            |                                                                      |
| CN1942267 A     | 20070404 | LSPB  | +C06  | PUBLICATION                                                     |                                                                      |
| EP1726385 A1    | 20061129 | LSPB  | +     | published / reissued                                            |                                                                      |
| EP1726385 A1    | 20061129 | LSSES | +17P  | REQUEST FOR EXAMINATION FILED                                   | EFFECTIVE DATE : 20060915                                            |
| EP1726385 A1    | 20070314 | LSAS  | RAP1  | RIGHTS OF AN APPLICATION TRANSFERRED                            | PARTYTYPE : OWNER<br>OWNER : KONDOH, KATSUYOSHI                      |
| EP1726385 A1    | 20070314 | LSAS  | RAP1  | RIGHTS OF AN APPLICATION TRANSFERRED                            | PARTYTYPE : OWNER<br>OWNER : GOHSYU CO., LTD.                        |
| EP1726385 A1    | 20070314 | LSAS  | RAP1  | RIGHTS OF AN APPLICATION TRANSFERRED                            | PARTYTYPE : OWNER<br>OWNER : KURIMOTO, LTD.                          |
| EP1726385 A4    | 20090527 | LSSES | +A4   | SUPPLEMENTARY SEARCH REPORT DRAWN UP AND DESPATCHED             | EFFECTIVE DATE : 20090427                                            |
| EP1726385 A4    | 20100505 | LSSES | +17Q  | FIRST EXAMINATION REPORT DESPATCHED                             | EFFECTIVE DATE : 20100331                                            |
| EP1726385 A4    | 20130529 | LSDW  | -18D  | APPLICATION DEEMED TO BE WITHDRAWN                              | EFFECTIVE DATE : 20121203                                            |
| JP2005256133 A2 | 20050922 | LSPB  | +     | published / reissued                                            |                                                                      |
| JP2005256133 A2 | 20051206 | LSRV  | -A02  | DECISION OF REFUSAL                                             | TEXT : JAPANESE INTERMEDIATE CODE: A02<br>EFFECTIVE DATE : 20051206  |
| JP2005256133 A2 | 20060201 | LSRE  | A521  | WRITTEN AMENDMENT                                               | TEXT : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20060131 |
| JP2005256133 A2 | 20060715 | LSRE  | A521  | WRITTEN AMENDMENT                                               | TEXT : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20060714 |
| JP2005256133 A2 | 20061004 | LSRE  | A521  | WRITTEN AMENDMENT                                               | TEXT : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20061003 |
| JP2005256133 A2 | 20061124 | LSFE  | +A61  | FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)           | TEXT : JAPANESE INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20061117  |
| JP2005256133 A2 | 20061124 | LSGT  | +R150 | CERTIFICATE OF PATENT OR REGISTRATION OF UTILITY MODEL          | TEXT : JAPANESE INTERMEDIATE CODE: R150                              |
| JP2006152446 A2 | 20060615 | LSPB  | +     | published / reissued                                            |                                                                      |
| JP2006152446 A2 | 20070605 | LSWD  | -A300 | WITHDRAWAL OF APPLICATION BECAUSE OF NO REQUEST FOR EXAMINATION | TEXT : JAPANESE INTERMEDIATE CODE: A300<br>EFFECTIVE DATE : 20070605 |
| JP3884741 B2    | 20070221 | LSGT  | +     | granted / extensions (spc, cpc, pte)                            |                                                                      |
| JP3884741 B2    | 20090825 | LSFE  | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)    | YEAR OF FEE PAYMENT : 4                                              |
| JP3884741 B2    | 20100914 | LSFE  | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)    | YEAR OF FEE PAYMENT : 5                                              |

|                 |          |      |       |                                                                                                   |                                                                                                                                                                                                                                                                  |
|-----------------|----------|------|-------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP3884741 B2    | 20111124 | LSLE | -LAPS | CANCELLATION<br>BECAUSE OF NO<br>PAYMENT OF<br>ANNUAL FEES                                        |                                                                                                                                                                                                                                                                  |
| JP3884741 B2    | 20240315 | PEXP |       | Calculated Patent<br>Term Expiry                                                                  |                                                                                                                                                                                                                                                                  |
| KR20060135813 A | 20061229 | LSPB | +     | published /<br>reissued                                                                           |                                                                                                                                                                                                                                                                  |
| KR20060135813 A | 20090217 | LSES | A201  | REQUEST FOR<br>EXAMINATION                                                                        |                                                                                                                                                                                                                                                                  |
| KR20060135813 A | 20110412 | LSES | -E902 | NOTIFICATION OF<br>REASON FOR<br>REFUSAL                                                          |                                                                                                                                                                                                                                                                  |
| KR20060135813 A | 20110726 | LSGT | +E701 | DECISION TO<br>GRANT OR<br>REGISTRATION OF<br>PATENT RIGHT                                        |                                                                                                                                                                                                                                                                  |
| US2008038573 AA | 20080214 | LSPB | +     | published /<br>reissued                                                                           |                                                                                                                                                                                                                                                                  |
| US7909948 BB    | 20110322 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                        |                                                                                                                                                                                                                                                                  |
| US7909948 BB    | 20071219 | LSAS | AS    | ASSIGNMENT                                                                                        | PARTYTYPE : OWNER<br>OWNER : KURIMOTO, LTD.,<br>JAPAN<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:FUKUI, HIDEAKI;<br>SHIOZAKI, SHUJI; AGATA,<br>HAJIME; AND OTHERS;<br>REEL/FRAME:020274/0399;<br>SIGNING DATES FROM 20070612<br>TO 20070615 |
| US7909948 BB    | 20071219 | LSAS | AS    | ASSIGNMENT                                                                                        | PARTYTYPE : OWNER<br>OWNER : KURIMOTO, LTD.,<br>JAPAN<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:FUKUI, HIDEAKI;<br>SHIOZAKI, SHUJI; AGATA,<br>HAJIME; AND OTHERS; SIGNING<br>DATES FROM 20070612 TO<br>20070615;<br>REEL/FRAME:020274/0399 |
| US7909948 BB    | 20071219 | LSAS | AS    | ASSIGNMENT                                                                                        | PARTYTYPE : OWNER<br>OWNER : GOHSYU CO., LTD.,<br>JAPAN<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:GOTO, MITSUHIRO;<br>REEL/FRAME:020274/0407<br>EFFECTIVE DATE : 20070615                                                                   |
| US7909948 BB    | 20150322 | LSLE | -LAPS | LAPSE FOR FAILURE<br>TO PAY<br>MAINTENANCE FEES                                                   |                                                                                                                                                                                                                                                                  |
| US7909948 BB    | 20150420 | LSLE | -PEX1 | Patent Expired Due<br>to NonPayment of<br>Maintenance Fees<br>Under 37 CFR<br>1.362               |                                                                                                                                                                                                                                                                  |
| US7909948 BB    | 20150420 | LSLE | -STCH | INFORMATION ON<br>STATUS: PATENT<br>DISCONTINUATION                                               | TEXT : PATENT EXPIRED DUE TO<br>NONPAYMENT OF MAINTENANCE<br>FEES UNDER 37 CFR 1.362                                                                                                                                                                             |
| US7909948 BB    | 20150512 | LSLE | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE                                               | EFFECTIVE DATE : 20150322                                                                                                                                                                                                                                        |
| US7909948 BB    | 20261127 | PEXP |       | Calculated Patent<br>Term Expiry (PTA<br>920 days and a<br>terminal disclaimer<br>has been filed) |                                                                                                                                                                                                                                                                  |
| WO05087410 A1   | 20050922 | LSPB | +     | published /<br>reissued                                                                           |                                                                                                                                                                                                                                                                  |
| WO05087410 A1   | 20040521 | LSNP | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE                                              | REF DOCUMENT NUMBER :<br>200480042439.5<br>COUNTRY OF REF DOCUMENT :<br>CN                                                                                                                                                                                       |
| WO05087410 A1   | 20060913 | LSNP | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE                                              | REF DOCUMENT NUMBER :<br>1020067018751<br>COUNTRY OF REF DOCUMENT :<br>KR                                                                                                                                                                                        |
| WO05087410 A1   | 20060915 | LSNP | +WWE  | WIPO<br>INFORMATION:                                                                              | REF DOCUMENT NUMBER :<br>2004745278                                                                                                                                                                                                                              |

|               |          |      |      |                                                         |                                                                        |
|---------------|----------|------|------|---------------------------------------------------------|------------------------------------------------------------------------|
|               |          |      |      | ENTRY INTO<br>NATIONAL PHASE                            | COUNTRY OF REF DOCUMENT :<br>EP                                        |
| WO05087410 A1 | 20060916 | LSNE | NENP | NON-ENTRY INTO<br>THE NATIONAL<br>PHASE IN:             | REF COUNTRY CODE : DE                                                  |
| WO05087410 A1 | 20060916 | LSWD | -WWW | WIPO<br>INFORMATION:<br>WITHDRAWN IN<br>NATIONAL OFFICE | TEXT : DE                                                              |
| WO05087410 A1 | 20061129 | LSPB | +WWP | WIPO<br>INFORMATION:<br>PUBLISHED IN<br>NATIONAL OFFICE | REF DOCUMENT NUMBER :<br>2004745278<br>COUNTRY OF REF DOCUMENT :<br>EP |
| WO05087410 A1 | 20070713 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE    | REF DOCUMENT NUMBER :<br>10592877<br>COUNTRY OF REF DOCUMENT :<br>US   |
| WO05087410 A1 | 20080214 | LSPB | +WWP | WIPO<br>INFORMATION:<br>PUBLISHED IN<br>NATIONAL OFFICE | REF DOCUMENT NUMBER :<br>10592877<br>COUNTRY OF REF DOCUMENT :<br>US   |

**Title:** SEGMENT ROLL FOR CONTINUOUS CASTING MACHINES

**Abstract:** A segment roll for use in a continuous casting machine includes a number of roll segments axially spaced apart and supported in bearings on a non-rotating shaft. Each roll segment is a self-contained unit including a sleeve-shaped outer mantle, an internal sleeve disposed coaxially within the outer mantle, and a bearing assembly disposed radially between the outer mantle and the inner sleeve within an annular recess disposed at each end of the roll segment. Each bearing assembly is spaced from an inner envelope surface of the internal sleeve and includes a bearing and a seal, wherein the internal sleeve is in non-rotatable contact with the non-rotating sleeve.

**Classifications:**

**International (IPC 8-9):** B22D11/06 B22D11/12 B22D11/128 F16C13/04 (Advanced/Invention);

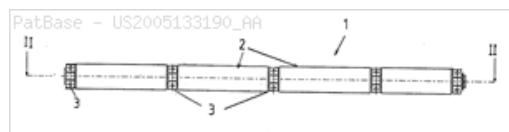
B22D11/06 B22D11/12 B22D11/128 F16C13/02 (Core/Invention)

**International (IPC 1-7):** B22D11/06 B22D11/128 B22D11/16 F16C13/04

**CPC:** B22D11/1287

**European:** B22D11/128R

**US:** 164/442 164/448



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT439202 E         | 20090815         | AT20040106214T     | 20041201         |
| BRPI0405291 A      | 20050830         | BR2004PI05291      | 20041129         |
| CN1296159 C        | 20070124         | CN200410097960     | 20041202         |
| CN1623704 A        | 20050608         | CN200410097960     | 20041202         |
| DE602004022502 D1  | 20090924         | DE200460022502T    | 20041201         |
| EP1537927 A1       | 20050608         | EP20040106214      | 20041201         |
| EP1537927 B1       | 20090812         | EP20040106214      | 20041201         |
| JP2005161405 A2    | 20050623         | JP20040338414      | 20041124         |
| JP3844767 B2       | 20061115         | JP20040338414      | 20041124         |
| SE200303241 A      | 20050603         | SE20030003241      | 20031202         |
| SE200303241 A0     | 20031202         | SE20030003241      | 20031202         |
| SE526914 C2        | 20051115         | SE20030003241      | 20031202         |
| US2005133190 AA    | 20050623         | US20040000398      | 20041201         |
| US7096923 BB       | 20060829         | US20040000398      | 20041201         |

**Priority:**

SE20030003241 20031202

**Probable Assignee:** SKF AB

**Assignee(s):** (std): SKF AB

**Assignee(s):** AKTIEBOLAGET SKF ; AB SKF ; AKTIE BOLAGET SKF

**Inventor(s):** (std): AXELSSON MAGNUS ; COSTA PATRIK ; BODE JENS ; ROSENBERG FILIP ; D UVA RENATO ; ROSENGREN FILIP ; UVA RENATO D ; MAGNUS AXELSSON ; PATRIK COSTA ; JENS BODE ; FILIP ROSENBERG ; RENATO D UVA ; RENATO AXELSSON MAGNUS COSTA P ; FILIP ROSENGREN

**Inventor(s):** AXELSSON MAGNUS COSTA PATRIK BODE JENS ; AXELSSON MAGNUS COSTA PATRIK BODE JENS ROSENBERG F

**Agent(s):** WESTMAN PER BOERJE INGEMAR; BURNS DOANE SWECKER AND MATHIS L L P; BUCHANAN INGERSOLL AND ROONEY PC

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

**Legal status (INPADOC)**

[View legal status timeline](#)

| Patent        | Date recorded | Event group | Code | Event                                                                           | Details                                                               |
|---------------|---------------|-------------|------|---------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| AT439202 E    | 20090815      | LSGT        | +    | granted / extensions (spc, cpc, pte)                                            |                                                                       |
| AT439202 E    | 20100415      | LSPB        | +UEP | PUBLICATION OF TRANSLATION OF EUROPEAN PATENT SPECIFICATION                     | REF DOCUMENT NUMBER : 1537927<br>COUNTRY OF REF DOCUMENT : EP         |
| AT439202 E    | 20241201      | PEXP        |      | Calculated Patent Term Expiry                                                   |                                                                       |
| BRPI0405291 A | 20050830      | LSPB        | +    | published / reissued                                                            |                                                                       |
| BRPI0405291 A | 20100817      | LSES        | B07A | TECHNICAL EXAMINATION (OPINION): PUBLICATION OF TECHNICAL EXAMINATION (OPINION) |                                                                       |
| BRPI0405291 A | 20110503      | LSRV        | B09B | DECISION: REFUSAL                                                               | TEXT : INDEFIRO O PEDIDO DE ACORDO COM O(S) ARTIGO(S) 80 E 130 DA LPI |
| BRPI0405291 A | 20110726      | LSRV        | B09B | DECISION: REFUSAL                                                               | TEXT : MANTIDO O INDEFERIMENTO UMA VEZ QUE NAO FOI APRESENTADO        |

|                   |          |      |       |                                                                               |                                                                                                                                                              |
|-------------------|----------|------|-------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |          |      |       |                                                                               | RECURSO DENTRO DO PRAZO LEGAL.                                                                                                                               |
| BRPI0405291 A     | 20120103 | LSRV | B09B  | DECISION: REFUSAL                                                             | TEXT : ANULADA A PUBLICACAO DA MANUTENCAO DO INDEFERIMENTO, NOTIFICADA ATRAVES DA RPI 2116 DE 26/07/2011, POR TER SIDO INDEVIDA.                             |
| BRPI0405291 A     | 20120222 | LSAL | B12B  | APPEAL: APPEAL AGAINST REFUSAL                                                |                                                                                                                                                              |
| BRPI0405291 A     | 20160419 | LSRV | -B11D | DISMISSAL ACC. ART. 38, PAR 2 OF IPL - FAILURE TO PAY FEE AFTER GRANT IN TIME |                                                                                                                                                              |
| CN1296159 C       | 20070124 | LSGT | +     | granted / extensions (spc, cpc, pte)                                          |                                                                                                                                                              |
| CN1296159 C       | 20070124 | LSGT | +C14  | GRANT OF PATENT OR UTILITY MODEL                                              |                                                                                                                                                              |
| CN1296159 C       | 20241202 | PEXP |       | Calculated Patent Term Expiry                                                 |                                                                                                                                                              |
| CN1623704 A       | 20050608 | LSPB | +     | published / reissued                                                          |                                                                                                                                                              |
| CN1623704 A       | 20050608 | LSPB | +C06  | PUBLICATION                                                                   |                                                                                                                                                              |
| DE602004022502 D1 | 20100902 | LSGT | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                       |                                                                                                                                                              |
| EP1537927 A1      | 20050608 | LSPB | +     | published / reissued                                                          |                                                                                                                                                              |
| EP1537927 A1      | 20060201 | LSES | +17P  | REQUEST FOR EXAMINATION FILED                                                 | EFFECTIVE DATE : 20051208                                                                                                                                    |
| EP1537927 A1      | 20060301 | LSFE | +AKX  | DESIGNATION FEES PAID                                                         | COUNTRY OF REF DOCUMENT : AT<br>COUNTRY OF REF DOCUMENT : DE<br>COUNTRY OF REF DOCUMENT : FR<br>COUNTRY OF REF DOCUMENT : GB<br>COUNTRY OF REF DOCUMENT : IT |
| EP1537927 A1      | 20071128 | LSES | +17Q  | FIRST EXAMINATION REPORT DESPATCHED                                           | EFFECTIVE DATE : 20071026                                                                                                                                    |
| EP1537927 A1      | 20160429 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]    | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20151221<br>YEAR OF FEE PAYMENT : 12                                                                          |
| EP1537927 A1      | 20160429 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]    | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20160302<br>YEAR OF FEE PAYMENT : 12                                                                          |
| EP1537927 B1      | 20090812 | LSGT | +     | granted / extensions (spc, cpc, pte)                                          |                                                                                                                                                              |
| EP1537927 B1      | 20090812 | LSGT | REG   | REFERENCE TO A NATIONAL CODE                                                  | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D                                                                                                         |
| EP1537927 B1      | 20100721 | LSGT | +26N  | NO OPPOSITION FILED                                                           | EFFECTIVE DATE : 20100517                                                                                                                                    |
| EP1537927 B1      | 20151229 | 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 : 12                                             |
| EP1537927 B1      | 20160129 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]    | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20151230<br>YEAR OF FEE PAYMENT : 12                                                                          |
| EP1537927 B1      | 20160229 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]    | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20151229<br>YEAR OF FEE PAYMENT : 12                                                                          |

|                 |          |      |       |                                                                                                 |                                                                                                                            |
|-----------------|----------|------|-------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       | TO EPO]                                                                                         |                                                                                                                            |
| EP1537927 B1    | 20170228 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : AT<br>PAYMENT DATE : 20161228<br>YEAR OF FEE PAYMENT : 13                                        |
| EP1537927 B1    | 20170428 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20170228<br>YEAR OF FEE PAYMENT : 13                                        |
| EP1537927 B1    | 20170630 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20161223<br>YEAR OF FEE PAYMENT : 13                                        |
| EP1537927 B1    | 20170823 | LSLE | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                                   | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20161201                                                                         |
| EP1537927 B1    | 20170929 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST<br>EFFECTIVE DATE : 20170831                                            |
| EP1537927 B1    | 20171031 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : FR<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20170102 |
| EP1537927 B1    | 20171130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : GB<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20161201 |
| EP1537927 B1    | 20180228 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : AT<br>PAYMENT DATE : 20171228<br>YEAR OF FEE PAYMENT : 14                                        |
| EP1537927 B1    | 20180430 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20180228<br>YEAR OF FEE PAYMENT : 14                                        |
| EP1537927 B1    | 20180531 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20171220<br>YEAR OF FEE PAYMENT : 14                                        |
| EP1537927 B1    | 20190131 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : AT<br>PAYMENT DATE : 20181227<br>YEAR OF FEE PAYMENT : 15                                        |
| EP1537927 B1    | 20190430 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20190228<br>YEAR OF FEE PAYMENT : 15                                        |
| EP1537927 B1    | 20190430 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20181220<br>YEAR OF FEE PAYMENT : 15                                        |
| EP1537927 B1    | 20241201 | PEXP |       | Calculated Patent Term Expiry                                                                   |                                                                                                                            |
| JP2005161405 A2 | 20050623 | LSPB | +     | published / reissued                                                                            |                                                                                                                            |
| JP3844767 B2    | 20061115 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                            |                                                                                                                            |
| JP3844767 B2    | 20060525 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                                             | TEXT : JAPANESE<br>INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20060524                                                    |
| JP3844767 B2    | 20060727 | LSGT | +TRDD | DECISION OF                                                                                     |                                                                                                                            |

|               |          |      |       |                                                                                                             |                                                                        |
|---------------|----------|------|-------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| JP3844767 B2  | 20060802 | LSGT | +A01  | GRANT OR REJECTION WRITTEN<br>WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | TEXT : JAPANESE<br>INTERMEDIATE CODE: A01<br>EFFECTIVE DATE : 20060801 |
| JP3844767 B2  | 20060803 | LSGT | +A01  | 特許査定書 (Decision of patent grant)                                                                            |                                                                        |
| JP3844767 B2  | 20060822 | LSFE | R100  | 特許料納付書 (Patent fee payment form)                                                                            |                                                                        |
| JP3844767 B2  | 20060824 | LSFE | +A61  | FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)                                                       | TEXT : JAPANESE<br>INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20060816 |
| JP3844767 B2  | 20060825 | LSGT | +R150 | CERTIFICATE OF PATENT OR REGISTRATION OF UTILITY MODEL                                                      | TEXT : JAPANESE<br>INTERMEDIATE CODE: R150                             |
| JP3844767 B2  | 20090820 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                                                            |                                                                        |
| JP3844767 B2  | 20090825 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                                                | YEAR OF FEE PAYMENT : 4                                                |
| JP3844767 B2  | 20100812 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                                                            |                                                                        |
| JP3844767 B2  | 20100817 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                                                | YEAR OF FEE PAYMENT : 5                                                |
| JP3844767 B2  | 20110811 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                                                | YEAR OF FEE PAYMENT : 5                                                |
| JP3844767 B2  | 20110816 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                                                | YEAR OF FEE PAYMENT : 6                                                |
| JP3844767 B2  | 20120823 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                                                | YEAR OF FEE PAYMENT : 6                                                |
| JP3844767 B2  | 20120828 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                                                | YEAR OF FEE PAYMENT : 7                                                |
| JP3844767 B2  | 20130822 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                                                            |                                                                        |
| JP3844767 B2  | 20130827 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                                                                                      | TEXT : JAPANESE<br>INTERMEDIATE CODE: R250                             |
| JP3844767 B2  | 20140821 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                                                            |                                                                        |
| JP3844767 B2  | 20140826 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                                                                                      | TEXT : JAPANESE<br>INTERMEDIATE CODE: R250                             |
| JP3844767 B2  | 20150813 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                                                            |                                                                        |
| JP3844767 B2  | 20150818 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                                                                                      | TEXT : JAPANESE<br>INTERMEDIATE CODE: R250                             |
| JP3844767 B2  | 20160825 | LSLE | -LAPS | CANCELLATION BECAUSE OF NO PAYMENT OF ANNUAL FEES                                                           |                                                                        |
| JP3844767 B2  | 20241124 | PEXP |       | Calculated Patent Term Expiry                                                                               |                                                                        |
| SE200303241 A | 20050603 | LSPB | +     | published / reissued                                                                                        |                                                                        |
| SE526914 C2   | 20051115 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                                        |                                                                        |
| SE526914 C2   | 20170801 | LSLE | -NUG  | PATENT HAS LAPSED                                                                                           |                                                                        |
| SE526914 C2   | 20231202 | PEXP |       | Calculated Patent                                                                                           |                                                                        |

|                 |          |      |       | Term Expiry                                                             |                                                                                                                                                                                                                                                   |
|-----------------|----------|------|-------|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2005133190 AA | 20050623 | LSPB | +     | published / reissued                                                    |                                                                                                                                                                                                                                                   |
| US7096923 BB    | 20060829 | LSGT | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                                                                                                                                                                                   |
| US7096923 BB    | 20050302 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : AKTIEBOLAGET SKF, SWEDEN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:AXELSSON, MAGNUS; BODE, JENS; D'UVA, RENATO; AND OTHERS;<br>REEL/FRAME:016337/0814;<br>SIGNING DATES FROM 20050218 TO 20050224 |
| US7096923 BB    | 20060809 | LSGT | PAT1  | Patented Case                                                           |                                                                                                                                                                                                                                                   |
| US7096923 BB    | 20100301 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                           |
| US7096923 BB    | 20140224 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                           |
| US7096923 BB    | 20180409 | LSFE | FEPP  | FEE PAYMENT PROCEDURE                                                   | TEXT : MAINTENANCE FEE REMINDER MAILED (ORIGINAL EVENT CODE: REM.)                                                                                                                                                                                |
| US7096923 BB    | 20181001 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               | TEXT : PATENT EXPIRED FOR FAILURE TO PAY MAINTENANCE FEES (ORIGINAL EVENT CODE: EXP.); ENTITY STATUS OF PATENT OWNER: LARGE ENTITY                                                                                                                |
| US7096923 BB    | 20181001 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                                                                                                                                                                                                   |
| US7096923 BB    | 20181001 | LSLE | -STCH | INFORMATION ON STATUS: PATENT DISCONTINUATION                           | TEXT : PATENT EXPIRED DUE TO NONPAYMENT OF MAINTENANCE FEES UNDER 37 CFR 1.362                                                                                                                                                                    |
| US7096923 BB    | 20181023 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20180829                                                                                                                                                                                                                         |
| US7096923 BB    | 20241220 | PEXP |       | Calculated Patent Term Expiry (PTA 19 days)                             |                                                                                                                                                                                                                                                   |

**Title:** Apparatus for applying a coating material

**Abstract:** An apparatus is disclosed for applying a coating material to a sheet material which is particularly useful in connection with preventing evaporation or drying out of the coating material when the apparatus is not in use. The apparatus basically includes a reservoir for containing a supply of coating material and an applicator roll having an applicator surface or surfaces thereon which is rotatably mounted in the reservoir so that coating material is received by the applicator surfaces and applied to the sheet material which is placed in contact therewith during rotation of the applicator roll. In accordance with one aspect, the applicator roll includes a plurality of substantially cylindrical applicator surfaces along the length thereof separated by a plurality of grooves, and a deflector device is provided having protruding portions disposed in the grooves of the applicator roll to cause the sheet material in contact with the applicator roll to separate from the applicator roll and be moved onto raised surface portions of the deflector device, the raised surface portions being such as to prevent contact of the coated surface of the sheet material with the downstream surface of the apparatus as the sheet material leaves the applicator roll. In accordance with other aspects of the apparatus, devices for sealing the reservoir and applicator roll from exposure to the surrounding atmosphere are provided. Additionally, a doctor blade mechanism for controlling the thickness of coating material received on the applicator roll during rotation is disclosed by which the position of the doctor blade with respect to the applicator surface of the applicator roll may be adjusted from a location displaced from the path of movement of a sheet material being fed to the applicator roll.

**Classifications:**

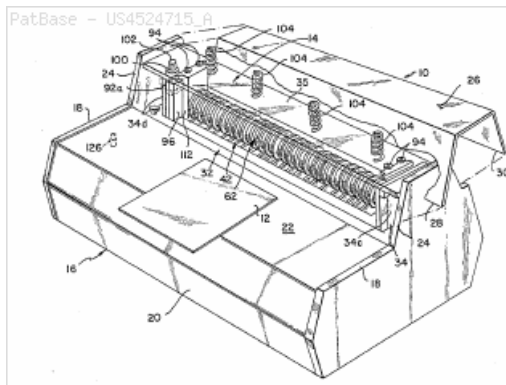
**International (IPC 8-9):** D06B1/14 D06B23/16 (Advanced/Invention); D06B1/00 D06B23/00 (Core/Invention)

**International (IPC 1-7):** B05C1/08 B05C1/16

**CPC:** D06B23/16 D06B1/141

**European:** D06B1/14B D06B23/16

**US:** 118/221 118/245 118/249 118/261 118/64



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US4524715 A        | 19850625         | US19830480322      | 19830330         |

**Priority:**

US19830480322 19830330

**Probable Assignee:**

ABRAMS WILLIAM C

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

ABRAMS WILLIAM C

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

ABRAMS WILLIAM C

**Legal status (INPADOC)**

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| Patent      | Date recorded | Event group | Code  | Event                                                                   | Details                                                                        |
|-------------|---------------|-------------|-------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| US4524715 A | 19850625      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                    |                                                                                |
| US4524715 A | 19890625      | LSLE        | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                                                                                |
| US4524715 A | 19890625      | LSLE        | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                                |
| US4524715 A | 19890625      | LSLE        | -STCH | INFORMATION ON STATUS: PATENT DISCONTINUATION                           | TEXT : PATENT EXPIRED DUE TO NONPAYMENT OF MAINTENANCE FEES UNDER 37 CFR 1.362 |
| US4524715 A | 19890919      | LSLE        | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 19890625                                                      |

**Title:** FIXING APPARATUS

**Abstract:** A fixing apparatus comprises a fixing roller, a pressing roller, a third roller disposed in parallel with the fixing roller, and a fixing belt wound around the fixing roller and the third roller. The fixing roller is pressed against the pressing roller via a fixing belt. The third roller or the fixing belt includes a heat generating resistive sheet. The heat generating resistive sheet rapidly heats the fixing belt. The fixing belt efficiently transfers heat to paper. The fixing roller does not need to transfer heat from the inside to the outside. Therefore, an elastic material layer is provided on the surface of the fixing roller.

**Classifications:**

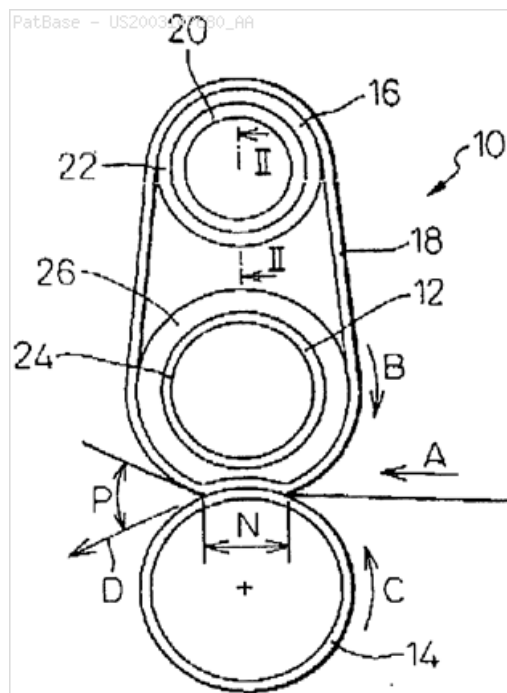
**International (IPC 8-9):** G03G15/20 (Advanced/Invention);  
G03G15/20 (Core/Invention)

**International (IPC 1-7):** G03G15/20

**CPC:** G03G15/2 G03G15/2057 G03G15/2064 G03G2215/2016  
G03G2215/2032 G03G15/20

**European:** G03G15/20H2P S03G215/20A3 S03G215/20A3R2

**US:** 219/216 399/329 399/333



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN1308778 C        | 20070404         | CN20008019324      | 20000315         |
| CN1451104 A        | 20031022         | CN20008019324      | 20000315         |
| DE10085449 T       | 20030130         | DE20001085449T     | 20000315         |
| DE10085449 T0      | 20030130         | DE20001085449T     | 20000315         |
| DE10085449 T1      | 20030130         | DE20001085449T     | 20000315         |
| JP2001069326 A1    | 20030708         | JP20010568141T     | 20000315         |
| KR100630352 B1     | 20061002         | KR20027012070      | 20000315         |
| KR20030005224 A    | 20030117         | KR20027012070      | 20000315         |
| US2003147680 AA    | 20030807         | US20020242661      | 20020913         |
| WO0169326 A1       | 20010920         | WO2000JP01585      | 20000315         |

**Priority:**

WO2000JP01585 20000315 KR20027012070 20020913

**Probable Assignee:** FUJITSU LTD

**Assignee(s):** (std): FUJI XEROX CO LTD ; FUJITSU LTD ; KAWAMURA TAKAO ; YUKAWA TOSHIHIRO ; KIMURA MASATOSHI ; KONISHI MASAO

**Assignee(s):** FUJITSU LTD KAWASAKI ; FUJITSU LIMITED ; FUJI XEROX CO

**Inventor(s):** (std): KIMURA MASATOSHI ; KAWAMURA TAKAO ; YUKAWA TOSHIHIRO ; KONISHI MASAO ; MASATOSHI KIMURA ; TOSHIHIRO YAKAWA ; TAKAO KAWAMURA ; MASATOSHI KAWAMURA TAKAO YAKAW

**Inventor(s):** KAWAMURA TAKAO YAKAWA TOSHIHIRO KIMURA MASATOSHI ; YAKAWA TOSHIHIRO

**Agent(s):** TSURUTA JUNICHI; NISHIYAMA MASAYA; HIGUCHI SOTOJI; ISHIDA TAKASHI

**Designated states:** CN DE JP KR US

**Legal status (INPADOC)**

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| Patent      | Date recorded | Event group | Code  | Event                                                        | Details |
|-------------|---------------|-------------|-------|--------------------------------------------------------------|---------|
| CN1308778 C | 20070404      | LSGT        | +     | granted / extensions (spc, cpc, pte)                         |         |
| CN1308778 C | 20070404      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL                             |         |
| CN1308778 C | 20190308      | LSLE        | -CF01 | TERMINATION OF PATENT RIGHT DUE TO NON-PAYMENT OF ANNUAL FEE |         |
| CN1308778 C | 20200315      | PEXP        |       | Calculated Patent Term Expiry                                |         |

|                 |          |      |       |                                                       |                                                                                                                                                                                                                                                           |
|-----------------|----------|------|-------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CN1451104 A     | 20031022 | LSPB | +     | published / reissued                                  |                                                                                                                                                                                                                                                           |
| CN1451104 A     | 20031022 | LSPB | +C06  | PUBLICATION                                           |                                                                                                                                                                                                                                                           |
| DE10085449 T    | 20030130 | LSPB | +     | published / reissued                                  |                                                                                                                                                                                                                                                           |
| DE10085449 T0   | 20030130 | LSPB | +     | published / reissued                                  |                                                                                                                                                                                                                                                           |
| DE10085449 T1   | 20030130 | LSPB | +     | published / reissued                                  |                                                                                                                                                                                                                                                           |
| DE10085449 T1   | 20030130 | LSES | +OP8  | REQUEST FOR EXAMINATION AS TO PARAGRAPH 44 PATENT LAW | REF DOCUMENT NUMBER : 10085449<br>COUNTRY OF REF DOCUMENT : DE<br>DATE OF REF DOCUMENT : 20030130<br>KIND CODE OF REF DOCUMENT : P<br>DESIGNATED STATE(S) :                                                                                               |
| DE10085449 T1   | 20030403 | LSLE | -8139 | DISPOSAL/NON-PAYMENT OF THE ANNUAL FEE                |                                                                                                                                                                                                                                                           |
| DE10085449 T1   | 20030724 | LSAS | 8127  | NEW PERSON/NAME/ADDRESS OF THE APPLICANT              | PARTYTYPE : OWNER<br>OWNER : FUJI XEROX CO., LTD., TOKIO/TOKYO, JP                                                                                                                                                                                        |
| DE10085449 T1   | 20031218 | LSRE | +8170 | REINSTATEMENT OF THE FORMER POSITION                  |                                                                                                                                                                                                                                                           |
| DE10085449 T1   | 20041118 | LSRV | -8131 | REJECTION                                             |                                                                                                                                                                                                                                                           |
| JP2001069326 A1 | 20030708 | LSPB | +     | published / reissued                                  |                                                                                                                                                                                                                                                           |
| KR100630352 B1  | 20061002 | LSGT | +     | granted / extensions (spc, cpc, pte)                  |                                                                                                                                                                                                                                                           |
| KR100630352 B1  | 20120907 | LSFE | FPAY  | ANNUAL FEE PAYMENT                                    | PAYMENT DATE : 20120907<br>YEAR OF FEE PAYMENT : 7                                                                                                                                                                                                        |
| KR100630352 B1  | 20130903 | LSFE | FPAY  | ANNUAL FEE PAYMENT                                    | PAYMENT DATE : 20130903<br>YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                        |
| KR100630352 B1  | 20140901 | LSFE | FPAY  | ANNUAL FEE PAYMENT                                    | PAYMENT DATE : 20140901<br>YEAR OF FEE PAYMENT : 9                                                                                                                                                                                                        |
| KR100630352 B1  | 20150827 | LSFE | FPAY  | ANNUAL FEE PAYMENT                                    | PAYMENT DATE : 20150827<br>YEAR OF FEE PAYMENT : 10                                                                                                                                                                                                       |
| KR100630352 B1  | 20160830 | LSFE | FPAY  | ANNUAL FEE PAYMENT                                    | PAYMENT DATE : 20160831<br>YEAR OF FEE PAYMENT : 11                                                                                                                                                                                                       |
| KR100630352 B1  | 20170830 | LSFE | FPAY  | ANNUAL FEE PAYMENT                                    | PAYMENT DATE : 20170830<br>YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                       |
| KR100630352 B1  | 20180904 | LSFE | FPAY  | ANNUAL FEE PAYMENT                                    | PAYMENT DATE : 20180904<br>YEAR OF FEE PAYMENT : 13                                                                                                                                                                                                       |
| KR100630352 B1  | 20200315 | PEXP |       | Calculated Patent Term Expiry                         |                                                                                                                                                                                                                                                           |
| KR20030005224 A | 20030117 | LSPB | +     | published / reissued                                  |                                                                                                                                                                                                                                                           |
| KR20030005224 A | 20040219 | LSES | A201  | REQUEST FOR EXAMINATION                               |                                                                                                                                                                                                                                                           |
| KR20030005224 A | 20051118 | LSES | -E902 | NOTIFICATION OF REASON FOR REFUSAL                    |                                                                                                                                                                                                                                                           |
| KR20030005224 A | 20060630 | LSGT | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT     |                                                                                                                                                                                                                                                           |
| KR20030005224 A | 20060925 | LSGT | +GRNT | WRITTEN DECISION TO GRANT                             |                                                                                                                                                                                                                                                           |
| US2003147680 AA | 20030807 | LSPB | +     | published / reissued                                  |                                                                                                                                                                                                                                                           |
| US2003147680 AA | 20030414 | LSAS | AS    | ASSIGNMENT                                            | PARTYTYPE : OWNER<br>OWNER : KAWAMURA, TAKAO, JAPAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:KAWAMURA, TAKAO; YUKAWA, TOSHIHIRO; KIMURA, MASATOSHI; AND OTHERS;<br>REEL/FRAME:013956/0102;<br>SIGNING DATES FROM 20030120 TO 20030404 |
| US2003147680 AA | 20030414 | LSAS | AS    | ASSIGNMENT                                            | PARTYTYPE : OWNER<br>OWNER : FUJITSU LIMITED, JAPAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:KAWAMURA,                                                                                                                                |

TAKAO; YUKAWA,  
TOSHIHIRO; KIMURA,  
MASATOSHI; AND OTHERS;  
REEL/FRAME:013956/0102;  
SIGNING DATES FROM  
20030120 TO 20030404

|                 |          |      |       |                                                     |                                                                                                                             |
|-----------------|----------|------|-------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| US2003147680 AA | 20040503 | LSWD | -ABD3 | Abandoned -- Failure to Respond to an Office Action |                                                                                                                             |
| WO0169326 A1    | 20010920 | LSPB | +     | published / reissued                                |                                                                                                                             |
| WO0169326 A1    | 20020829 | LSNP | ENP   | ENTRY INTO THE NATIONAL PHASE IN:                   | REF DOCUMENT NUMBER : 2001 568141<br>COUNTRY OF REF DOCUMENT : JP<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) : |
| WO0169326 A1    | 20020913 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE         | REF DOCUMENT NUMBER : 00819324X<br>COUNTRY OF REF DOCUMENT : CN                                                             |
| WO0169326 A1    | 20020913 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE         | REF DOCUMENT NUMBER : 1020027012070<br>COUNTRY OF REF DOCUMENT : KR                                                         |
| WO0169326 A1    | 20020913 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE         | REF DOCUMENT NUMBER : 10242661<br>COUNTRY OF REF DOCUMENT : US                                                              |
| WO0169326 A1    | 20030117 | LSPB | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE      | REF DOCUMENT NUMBER : 1020027012070<br>COUNTRY OF REF DOCUMENT : KR                                                         |
| WO0169326 A1    | 20030130 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE         | REF DOCUMENT NUMBER : 10085449<br>COUNTRY OF REF DOCUMENT : DE                                                              |
| WO0169326 A1    | 20060630 | LSGT | +WWG  | WIPO INFORMATION: GRANT IN NATIONAL OFFICE          | REF DOCUMENT NUMBER : 1020027012070<br>COUNTRY OF REF DOCUMENT : KR                                                         |

**Title:** LARGE-PARTICLE INKJET DUAL-SIGN DEVELOPMENT PRINTING

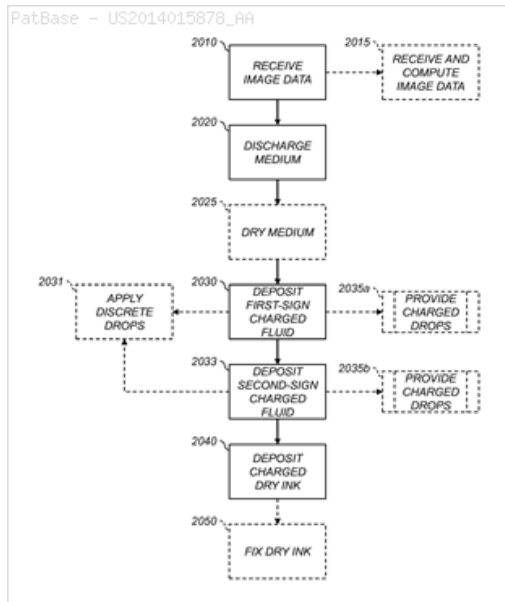
**Abstract:** A method of producing a print on a recording medium includes receiving positive and negative image data for the print to be produced. A selected region of the recording medium is discharged. First-sign charged fluid is deposited in a selected first-sign charged-fluid pattern on the selected region of the recording medium, the first-sign charged-fluid pattern corresponding to the positive image data. Second-sign charged fluid is deposited in a selected second-sign charged-fluid pattern on the selected region of the recording medium, the second-sign charged-fluid pattern corresponding to the negative image data and the second sign being different from the first, sign. Charged dry ink having charge of the second sign is deposited onto the recording medium. The deposited dry ink is attracted to the first-sign charged-fluid pattern and adheres to the recording medium in the first-sign charged-fluid pattern.

**Classifications:**

**International (IPC 8-9):** B41J2/02 B41J2/04 B41J2/41 B41J29/38  
B41J3/00 G03G15/32 (Advanced/Invention);  
B41J3/54 (Advanced/Non-invention)

**CPC:** G03G15/321 B41J3/546 B41J2/04 B41J2/105 B41J2/18

**US:** 347/112 347/2 347/54 347/73 347/9

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2014015878 AA    | 20140116         | US20120547320      | 20120712         |
| US8791971 BB       | 20140729         | US20120547320      | 20120712         |

**Priority:**

US20120547320 20120712

**Probable Assignee:** EASTMAN KODAK CO

**Assignee(s):** (std): EASTMAN KODAK CO ; MARCUS MICHAEL ALAN ; PANCHAWAGH HRISHIKESH V

**Assignee(s):** PAKON INC ; WILMINGTON TRUST NATIONAL ASSOCIATION AGENT AS ; KODAK REALTY INC ; LASER PACIFIC MEDIA CORP ; NPEC INC ; PFC INC ; QUALEX INC ; JPMORGAN CHASE BANK NA ADMINISTRATIVE AS ; FAR EAST DEVELOPMENT LTD ; KODAK AMERICAS LTD ; KODAK AVIATION LEASING LLC ; KODAK IMAGING NETWORK INC ; KODAK NEAR EAST INC ; KODAK PHILIPPINES LTD ; KODAK PORTUGUESA LTD ; BANK OF AMERICA NA AGENT AS ; BARCLAYS BANK PLC ADMINISTRATIVE AGENT AS ; CREO MFG AMERICA LLC

**Inventor(s):** (std): MARCUS MICHAEL ALAN ; PANCHAWAGH HRISHIKESH V

**Agent(s):** PEYTON C ; CHRISTOPHER J

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code | Event                                | Details                                                                                                                                                                                                                                       |
|-----------------|---------------|-------------|------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2014015878 AA | 20140116      | LSPB        | +    | published / reissued                 |                                                                                                                                                                                                                                               |
| US2014015878 AA | 20140709      | LSGT        | STCF | INFORMATION ON STATUS: PATENT GRANT  | TEXT : PATENTED CASE                                                                                                                                                                                                                          |
| US8791971 BB    | 20140729      | LSGT        | +    | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                                               |
| US8791971 BB    | 20120925      | LSAS        | AS   | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY, NEW YORK<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:MARCUS, MICHAEL ALAN; PANCHAWAGH, HRISHIKESH V.;<br>SIGNING DATES FROM 20120812 TO 20120829; REEL/FRAME:029021/0142 |
| US8791971 BB    | 20130401      | LSAS        | AS   | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : WILMINGTON TRUST,                                                                                                                                                                                                |

|              |          |      |       |                            |                                                                                                                                                                                                                                                                                                                        |
|--------------|----------|------|-------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       |                            | NATIONAL ASSOCIATION, AS AGENT,<br>OLDPARTY : PATENT SECURITY<br>AGREEMENT; ASSIGNORS:EASTMAN<br>KODAK COMPANY; PAKON, INC.;<br>REEL/FRAME:030122/0235<br>EFFECTIVE DATE : 20130322                                                                                                                                    |
| US8791971 BB | 20130905 | LSAS | AS    | ASSIGNMENT                 | PARTYTYPE : OWNER<br>OWNER : BANK OF AMERICA N.A., AS<br>AGENT, MASSACHUSETTS<br>OLDPARTY : INTELLECTUAL PROPERTY<br>SECURITY AGREEMENT (ABL);<br>ASSIGNORS:EASTMAN KODAK<br>COMPANY; FAR EAST DEVELOPMENT<br>LTD.; FPC INC.; AND OTHERS;<br>REEL/FRAME:031162/0117<br>EFFECTIVE DATE : 20130903                       |
| US8791971 BB | 20130905 | LSAS | AS    | ASSIGNMENT                 | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY,<br>NEW YORK<br>OLDPARTY : RELEASE OF SECURITY<br>INTEREST IN PATENTS;<br>ASSIGNORS:CITICORP NORTH<br>AMERICA, INC., AS SENIOR DIP<br>AGENT; WILMINGTON TRUST,<br>NATIONAL ASSOCIATION, AS JUNIOR<br>DIP AGENT; REEL/FRAME:031157/0451<br>EFFECTIVE DATE : 20130903 |
| US8791971 BB | 20130905 | LSAS | AS    | ASSIGNMENT                 | PARTYTYPE : OWNER<br>OWNER : PAKON, INC., NEW YORK<br>OLDPARTY : RELEASE OF SECURITY<br>INTEREST IN PATENTS;<br>ASSIGNORS:CITICORP NORTH<br>AMERICA, INC., AS SENIOR DIP<br>AGENT; WILMINGTON TRUST,<br>NATIONAL ASSOCIATION, AS JUNIOR<br>DIP AGENT; REEL/FRAME:031157/0451<br>EFFECTIVE DATE : 20130903              |
| US8791971 BB | 20130905 | LSAS | AS    | ASSIGNMENT                 | PARTYTYPE : OWNER<br>OWNER : BARCLAYS BANK PLC, AS<br>ADMINISTRATIVE AGENT, NEW YO<br>OLDPARTY : INTELLECTUAL PROPERTY<br>SECURITY AGREEMENT (SECOND LIEN);<br>ASSIGNORS:EASTMAN KODAK<br>COMPANY; FAR EAST DEVELOPMENT<br>LTD.; FPC INC.; AND OTHERS;<br>REEL/FRAME:031159/0001<br>EFFECTIVE DATE : 20130903          |
| US8791971 BB | 20130905 | LSAS | AS    | ASSIGNMENT                 | PARTYTYPE : OWNER<br>OWNER : JPMORGAN CHASE BANK,<br>N.A., AS ADMINISTRATIVE, DELA<br>OLDPARTY : INTELLECTUAL PROPERTY<br>SECURITY AGREEMENT (FIRST LIEN);<br>ASSIGNORS:EASTMAN KODAK<br>COMPANY; FAR EAST DEVELOPMENT<br>LTD.; FPC INC.; AND OTHERS;<br>REEL/FRAME:031158/0001<br>EFFECTIVE DATE : 20130903           |
| US8791971 BB | 20140709 | LSGT | PAT1  | Patented<br>Case           |                                                                                                                                                                                                                                                                                                                        |
| US8791971 BB | 20171215 | LSFE | +MAFP | MAINTENANCE<br>FEE PAYMENT | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                                                                                |
| US8791971 BB | 20190730 | LSAS | AS    | ASSIGNMENT                 | PARTYTYPE : OWNER<br>OWNER : QUALEX, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                                                 |
| US8791971 BB | 20190730 | LSAS | AS    | ASSIGNMENT                 | PARTYTYPE : OWNER<br>OWNER : NPEC, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                                                   |
| US8791971 BB | 20190730 | LSAS | AS    | ASSIGNMENT                 | PARTYTYPE : OWNER<br>OWNER : KODAK IMAGING NETWORK,<br>INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                               |
| US8791971 BB | 20190730 | LSAS | AS    | ASSIGNMENT                 | PARTYTYPE : OWNER<br>OWNER : CREO MANUFACTURING<br>AMERICA LLC, NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE                                                                                                                                          |

|              |          |      |    |            |                                                                                                                                                                                                                                              |
|--------------|----------|------|----|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |    |            | AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                                                                                                                                   |
| US8791971 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK (NEAR EAST), INC.,<br>NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617         |
| US8791971 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY,<br>NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617           |
| US8791971 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : FAR EAST DEVELOPMENT<br>LTD., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617       |
| US8791971 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : PFC, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                          |
| US8791971 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK AMERICAS, LTD.,<br>NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617            |
| US8791971 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK PORTUGUESA<br>LIMITED, NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617        |
| US8791971 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK REALTY, INC., NEW<br>YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617              |
| US8791971 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : PAKON, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                        |
| US8791971 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : LASER PACIFIC MEDIA<br>CORPORATION, NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617 |
| US8791971 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK AVIATION LEASING<br>LLC, NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617      |
| US8791971 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK PHILIPPINES, LTD.,<br>NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE                                                                       |

US8791971 BB

20321116

PEXP

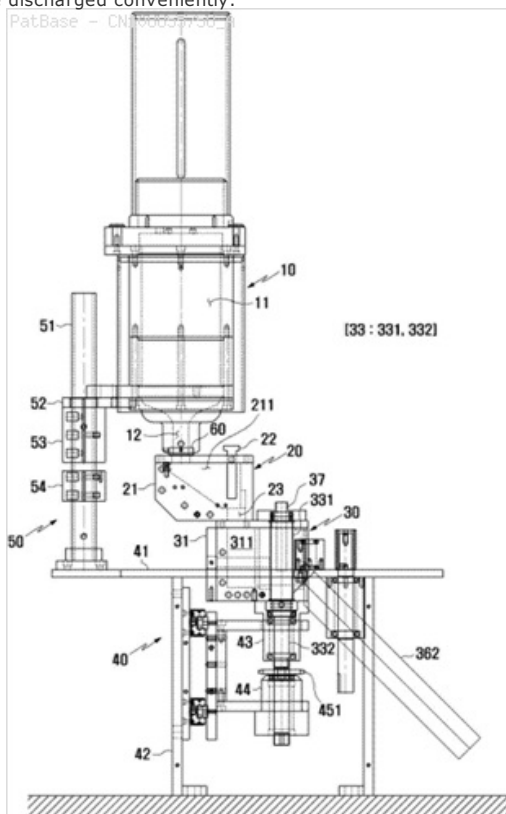
Calculated  
Patent Term  
Expiry (PTA  
127 days)

**Title:** ADHESIVE SUPPLY EQUIPMENT FOR BANDING MACHINE

**Abstract:** The invention discloses adhesive supply equipment for a banding machine. The adhesive supply equipment comprises a supply unit, a melting unit and a coating unit. The melting unit is detachably arranged on the supply unit and melts adhesive received from the supply unit. The coating unit is arranged on the melting unit and coats a wood plate with the molten adhesive. The coating unit comprises a machine shell, an open portion, a coating rolling shaft and a collection and discharging module. The machine shell comprises an internal containing space portion, wherein the internal containing space portion contains the molten adhesive. The side face of the machine shell is provided with the open portion. The open portion is connected with the containing space portion. The coating rolling shaft comprises a rotary type coating portion and a middle portion. The coating portion is vertically arranged in the containing space portion, and a peripheral part protrudes out of the machine shell through the open portion. The middle portion is connected to the lower portion of the coating portion and exposed out of the lower side of the machine shell. By means of the adhesive supply equipment, all components can be dismantled conveniently, and thus, internal cleaning can be conducted conveniently through chemicals or wash water; and in addition, the adhesive remaining on the coating rolling shaft can be discharged conveniently.

**Classifications:****International (IPC 8-9):** B05C1/08 B05C11/10

B05C13/02 (Advanced/Invention)

**CPC:** B05C1/08 B05C1/0891 B05C11/1039 B05C11/1042 B05C13/02**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN108855758 A      | 20181123         | CN201710338102     | 20170515         |

**Priority:**

CN201710338102 20170515

**Probable Assignee:**

JEONG NACK HYUN

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

JEONG NACK HYUN

**Assignee(s):**

ZHENG MUSIC NOW

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

JEONG NACK HYUN

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

| Patent        | Date recorded | Event group | Code | Event                | Details |
|---------------|---------------|-------------|------|----------------------|---------|
| CN108855758 A | 20181123      | LSPB        | +    | published / reissued |         |
| CN108855758 A | 20181123      | LSPB        | PB01 | PUBLICATION          |         |

**Title:** Continuous casting process and machine with at least one travelling casting belt for the production of metal strips and rods

**Abstract:** Casting process and device for the continuous casting of strip and thin slabs or rods whereby at least one wall of a casting mold is formed by a flexible open-end casting belt which travels from a coil through the mold is coiled up again after passing through the mold. The belt is submitted to a tensile force acting in the direction of its path of motion and so intensely that the belt, when it is heated up in the mold, is stressed beyond its elastic limit as to cause the belt to be strained to the extent that the growth of its cross-sectional area resulting from thermal expansion is sufficiently compensated for by the reduction of its cross-section due to the strain in the belt. Thereby an inadmissible deformation of the belt due to its thermal expansion is prevented.

**Classifications:**

**International (IPC 8-9):** B22D11/00 B22D11/06

B22D11/14 (Advanced/Invention);

B22D11/00 B22D11/14 (Advanced/Non-invention);

B22D11/00 B22D11/06 B22D11/14 (Core/Invention)

**International (IPC 1-7):** B22D11/00 B22D11/06 B22D11/08

B22D11/10 B22D11/14 B22D27/04 B22D9/00 B28B3/00 C22D11/006

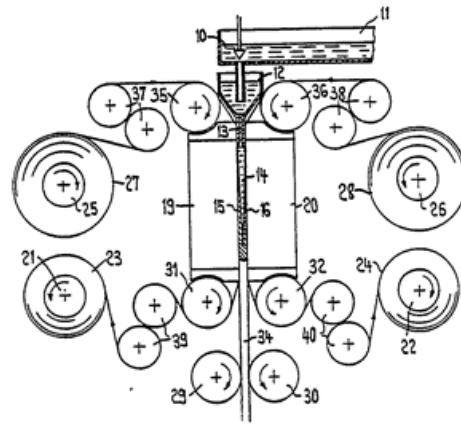
**CPC:** B22D11/0677

**European:** B22D11/06L4

**US:** 164/432 164/435 164/481

PatBase - US4964456\_A

**FIG.1**



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AR240413 A1        | 19900430         | AR19890313045      | 19890120         |
| AT61259 E          | 19910315         | AT19880810880T     | 19881220         |
| AU198927732 A1     | 19890803         | AU19890027732      | 19890105         |
| AU602281 B2        | 19901004         | AU19890027732      | 19890105         |
| BRPI8900346 A      | 19890919         | BR1989PI00346      | 19890127         |
| CA1314380 A1       | 19930316         | CA19890587724      | 19890109         |
| CN1010463 B        | 19901121         | CN19891000453      | 19890126         |
| CN1035455 A        | 19890913         | CN19891000453      | 19890126         |
| DD283347 A5        | 19901010         | DD19890325198      | 19890124         |
| DE3861967 D1       | 19910411         | DE19883861967      | 19881220         |
| DK170090 B1        | 19950522         | DK19880007096      | 19881220         |
| DK709688 A         | 19890729         | DK19880007096      | 19881220         |
| DK709688 A0        | 19881220         | DK19880007096      | 19881220         |
| EP0326788 A1       | 19890809         | EP19880810880      | 19881220         |
| EP0326788 B1       | 19910306         | EP19880810880      | 19881220         |
| ES2021162 B3       | 19911016         | ES19880810880T     | 19881220         |
| GR3001790 T3       | 19921123         | GR19910401193T     | 19910417         |
| JP1224149 A2       | 19890907         | JP19890019369      | 19890127         |
| JP2578967 B2       | 19970205         | JP19890019369      | 19890127         |
| KR19890011651 A    | 19890821         | KR19890000782      | 19890126         |
| KR960016461 B1     | 19961212         | KR19890000782      | 19890126         |
| LT3320 B           | 19950626         | LT19930000350      | 19930219         |
| LT350 A            | 19941125         | LT19930000350      | 19930219         |
| LV10592 A          | 19950420         | LV19930000023      | 19930113         |
| LV10592 B          | 19951220         | LV19930000023      | 19930113         |
| MD200 B1           | 19950531         | MD19940000226      | 19940506         |
| MD200 C2           | 19951130         | MD19940000226      | 19940506         |
| MX171829 B         | 19931118         | MX19890014636      | 19890124         |
| NO171489 B         | 19921214         | NO19890000363      | 19890127         |
| NO171489 C         | 19930324         | NO19890000363      | 19890127         |
| NO890363 A         | 19890731         | NO19890000363      | 19890127         |
| NO890363 A0        | 19890127         | NO19890000363      | 19890127         |
| NO890363 L         | 19890731         | NO19890000363      | 19890127         |
| RU1813025 C        | 19930430         | SU19894613264      | 19890118         |
| SU1813025 A3       | 19930430         | SU19894613264      | 19890118         |
| US4964456 A        | 19901023         | US19890293064      | 19890103         |
| ZA8900206 A        | 19891025         | ZA19890000206      | 19890110         |

**Priority:**

CH19880000297 19880128 EP19880810880 19881220 SU19894613264 19890118

**Probable Assignee:** ALCOA INC

**Assignee(s):** (std): LAREX AG

**Assignee(s):** LAREX AG CH ; LAREX AG RECHERSWIL CH ; RARETSUKUSU AG ; LARREKS AKTIENGESellschaft ; ALCOA INC ; LAREKS A G ; LAREX A G

**Inventor(s):** (std): LAUENER WILHELM FRIEDRICH ; UIRUHERUMU FURIIDORITSUHI RAUE ; LAUENER WILHELM F

**Inventor(s):** LAUNER WILHELM FRIEDRICH ; WILHELM FRIEDRICH LAUENER ; WILLHEIM FRIEDLICH LAUNNET ;

WILLHEIM FRIEDLICH LAUNNEL ; BUIRUHERUMU FURIIDORITSUHI RAUENAA ; UIRUHERUMU FURIIDORITSUHI RAUENAA ; LAUENER WILHELM FRIEDRICH CH 4563 GERLAFINGEN CH ; VILKHELM FRIDRIKH LAUENER ; LAUENER WILHELM F CH

**Agent(s):** GRIFFITH HACK; GLAZUNOV NICOLAI

**Designated states:** AT BE CH DE ES FR GB GR IT LI LU NL SE

#### Legal status (INPADOC)

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| Patent         | Date recorded | Event group | Code  | Event                                                                | Details                              |
|----------------|---------------|-------------|-------|----------------------------------------------------------------------|--------------------------------------|
| AR240413 A1    | 19900430      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                 |                                      |
| AR240413 A1    | 20090120      | PEXP        |       | Calculated Patent Term Expiry                                        |                                      |
| AT61259 E      | 19910315      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                 |                                      |
| AT61259 E      | 20040915      | LSLE        | -REN  | CEASED DUE TO NON-PAYMENT OF THE ANNUAL FEE                          |                                      |
| AT61259 E      | 20081220      | PEXP        |       | Calculated Patent Term Expiry                                        |                                      |
| AU198927732 A1 | 19890803      | LSPB        | +     | published / reissued                                                 |                                      |
| AU602281 B2    | 19901004      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                 |                                      |
| AU602281 B2    | 20090105      | PEXP        |       | Calculated Patent Term Expiry                                        |                                      |
| BRPI8900346 A  | 19890919      | LSPB        | +     | published / reissued                                                 |                                      |
| BRPI8900346 A  | 19960102      | LSGT        | +FF   | DECISION: INTENTION TO GRANT                                         |                                      |
| BRPI8900346 A  | 19960924      | LSGT        | +FG   | LETTER PATENT GRANTED                                                |                                      |
| BRPI8900346 A  | 20091215      | LSLE        | -B21A | EXPIRY ACC. ART. 78, ITEM I OF IPL- EXPIRY OF THE TERM OF PROTECTION | TEXT : PATENTE EXTINTA EM 27/01/2004 |
| CA1314380 A1   | 19930316      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                 |                                      |
| CA1314380 A1   | 20100316      | LSLE        | -MKEX | EXPIRY                                                               |                                      |
| CA1314380 A1   | 20100316      | PEXP        |       | Calculated Patent Term Expiry                                        |                                      |
| CN1010463 B    | 19901121      | LSPB        | +     | published / reissued                                                 |                                      |
| CN1010463 B    | 19910724      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL                                     |                                      |
| CN1010463 B    | 20040324      | LSLE        | -C19  | LAPSE OF PATENT RIGHT DUE TO NON-PAYMENT OF THE ANNUAL FEE           |                                      |
| CN1035455 A    | 19890913      | LSPB        | +     | published / reissued                                                 |                                      |
| CN1035455 A    | 19890913      | LSPB        | +C06  | PUBLICATION                                                          |                                      |
| DD283347 A5    | 19901010      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                 |                                      |
| DD283347 A5    | 19960118      | LSLE        | -ENJ  | CEASED DUE TO NON-PAYMENT OF RENEWAL FEE                             |                                      |
| DD283347 A5    | 20070124      | PEXP        |       | Calculated Patent Term Expiry                                        |                                      |
| DE3861967 D1   | 19920402      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                              |                                      |
| DK170090 B1    | 19950522      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                 |                                      |
| DK170090 B1    | 20040809      | LSLE        | -PBP  | PATENT LAPSED                                                        | TEXT : DK                            |
| DK170090 B1    | 20081220      | PEXP        |       | Calculated Patent Term Expiry                                        |                                      |
| DK709688 A     | 19890729      | LSPB        | +     | published / reissued                                                 |                                      |
| EP0326788 A1   | 19890809      | LSPB        | +     | published / reissued                                                 |                                      |
| EP0326788 A1   | 19890913      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                                        | EFFECTIVE DATE : 19890714            |
| EP0326788 A1   | 19900704      | LSES        | +17Q  | FIRST EXAMINATION REPORT DESPATCHED                                  | EFFECTIVE DATE : 19900518            |
| EP0326788 A1   | 19920226      | LSGT        | +26N  | NO OPPOSITION FILED                                                  |                                      |

|              |          |      |       |                                                                                                 |                                                                                                                           |
|--------------|----------|------|-------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| EP0326788 A1 | 19940121 | LSFE | +EPTA | LU: LAST PAID ANNUAL FEE                                                                        | REF COUNTRY CODE : EP                                                                                                     |
| EP0326788 A1 | 19950131 | LSGT | +EAL  | SE: EUROPEAN PATENT IN FORCE IN SWEDEN                                                          | REF COUNTRY CODE : EP<br>TEXT : 88810880.0                                                                                |
| EP0326788 A1 | 20020927 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : GR<br>PAYMENT DATE : 20020927<br>YEAR OF FEE PAYMENT : 15                                       |
| EP0326788 A1 | 20021024 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : LU<br>PAYMENT DATE : 20021024<br>YEAR OF FEE PAYMENT : 15                                       |
| EP0326788 A1 | 20021104 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : AT<br>PAYMENT DATE : 20021104<br>YEAR OF FEE PAYMENT : 15                                       |
| EP0326788 A1 | 20021104 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20021104<br>YEAR OF FEE PAYMENT : 15                                       |
| EP0326788 A1 | 20021112 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : NL<br>PAYMENT DATE : 20021112<br>YEAR OF FEE PAYMENT : 15                                       |
| EP0326788 A1 | 20021203 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : SE<br>PAYMENT DATE : 20021203<br>YEAR OF FEE PAYMENT : 15                                       |
| EP0326788 A1 | 20030116 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : BE<br>PAYMENT DATE : 20030116<br>YEAR OF FEE PAYMENT : 15                                       |
| EP0326788 A1 | 20031220 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : AT<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20031220 |
| EP0326788 A1 | 20031220 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : GB<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20031220 |
| EP0326788 A1 | 20031220 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : LU<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20031220 |
| EP0326788 A1 | 20031221 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : SE<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20031221 |
| EP0326788 A1 | 20031231 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : BE<br>NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20031231 |
| EP0326788 A1 | 20040630 | LSLE | -BERE | BE: LAPSED                                                                                      | PARTYTYPE : OWNER<br>REF COUNTRY CODE : EP<br>OWNER : *LAREX A.G.<br>EFFECTIVE DATE : 20031231                            |

|              |          |      |       |                                                                                                 |                                                                                                                                |
|--------------|----------|------|-------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| EP0326788 A1 | 20040701 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : NL<br>NOTIFICATION OF LAPSE :<br>LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20040701  |
| EP0326788 A1 | 20040705 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : GR<br>NOTIFICATION OF LAPSE :<br>LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20040705  |
| EP0326788 A1 | 20040803 | LSLE | -EUG  | SE: EUROPEAN PATENT HAS LAPSED                                                                  | REF COUNTRY CODE : EP                                                                                                          |
| EP0326788 A1 | 20040811 | LSLE | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                                   | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20031220                                                                             |
| EP0326788 A1 | 20040901 | LSLE | -NLV4 | NL: LAPSED OR ANULLED DUE TO NON-PAYMENT OF THE ANNUAL FEE                                      | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20040701                                                                             |
| EP0326788 A1 | 20051220 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : IT<br>NOTIFICATION OF LAPSE :<br>LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20051220  |
| EP0326788 A1 | 20080131 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : ES<br>PAYMENT DATE : 20071219<br>YEAR OF FEE PAYMENT : 20                                            |
| EP0326788 A1 | 20080229 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : CH<br>PAYMENT DATE : 20071009<br>YEAR OF FEE PAYMENT : 20                                            |
| EP0326788 A1 | 20080530 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20071228<br>YEAR OF FEE PAYMENT : 20                                            |
| EP0326788 A1 | 20080731 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20071204<br>YEAR OF FEE PAYMENT : 20                                            |
| EP0326788 A1 | 20081231 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                             |
| EP0326788 A1 | 20090316 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FD2A<br>EFFECTIVE DATE : 20081222                                              |
| EP0326788 A1 | 20090430 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : ES<br>NOTIFICATION OF LAPSE :<br>LAPSE BECAUSE OF EXPIRATION OF PROTECTION<br>LAPSED DATE : 20081222 |
| EP0326788 B1 | 19910306 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                            |                                                                                                                                |
| EP0326788 B1 | 20081220 | PEXP |       | Calculated Patent Term Expiry                                                                   |                                                                                                                                |
| ES2021162 B3 | 19911016 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                            |                                                                                                                                |
| ES2021162 B3 | 20081220 | PEXP |       | Calculated Patent Term Expiry                                                                   |                                                                                                                                |
| GR3001790 T3 | 19921123 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                            |                                                                                                                                |
| GR3001790 T3 | 20110417 | PEXP |       | Calculated Patent Term Expiry                                                                   |                                                                                                                                |

|                 |          |      |       |                                                         |                                                           |
|-----------------|----------|------|-------|---------------------------------------------------------|-----------------------------------------------------------|
| JP1224149 A2    | 19890907 | LSPB | +     | published / reissued                                    |                                                           |
| JP2578967 B2    | 19970205 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                 |                                                           |
| JP2578967 B2    | 20031107 | LSLE | -LAPS | CANCELLATION BECAUSE<br>OF NO PAYMENT OF<br>ANNUAL FEES |                                                           |
| JP2578967 B2    | 20090127 | PEXP |       | Calculated Patent Term<br>Expiry                        |                                                           |
| KR19890011651 A | 19890821 | LSPB | +     | published / reissued                                    |                                                           |
| KR960016461 B1  | 19961212 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                 |                                                           |
| KR960016461 B1  | 19940126 | LSES | A201  | REQUEST FOR<br>EXAMINATION                              |                                                           |
| KR960016461 B1  | 19960527 | LSES | -E902 | NOTIFICATION OF<br>REASON FOR REFUSAL                   |                                                           |
| KR960016461 B1  | 19961120 | LSPB | G160  | DECISION TO PUBLISH<br>PATENT APPLICATION               |                                                           |
| KR960016461 B1  | 19970306 | LSGT | +E701 | DECISION TO GRANT OR<br>REGISTRATION OF<br>PATENT RIGHT |                                                           |
| KR960016461 B1  | 19970512 | LSGT | +GRNT | WRITTEN DECISION TO<br>GRANT                            |                                                           |
| KR960016461 B1  | 20101203 | LSFE | FPAY  | ANNUAL FEE PAYMENT                                      | PAYMENT DATE :<br>20101206<br>YEAR OF FEE PAYMENT :<br>15 |
| KR960016461 B1  | 20111213 | LSLE | -EXPY | EXPIRATION OF TERM                                      |                                                           |
| KR960016461 B1  | 20111212 | PEXP |       | Calculated Patent Term<br>Expiry                        |                                                           |
| LT3320 B        | 19950626 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                 |                                                           |
| LT3320 B        | 20031027 | LSLE | -MM9A | LAPSED PATENTS                                          | EFFECTIVE DATE :<br>20030219                              |
| LT3320 B        | 20130219 | PEXP |       | Calculated Patent Term<br>Expiry                        |                                                           |
| LT350 A         | 19941125 | LSPB | +     | published / reissued                                    |                                                           |
| LV10592 A       | 19950420 | LSPB | +     | published / reissued                                    |                                                           |
| LV10592 B       | 19951220 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                 |                                                           |
| LV10592 B       | 20130113 | PEXP |       | Calculated Patent Term<br>Expiry                        |                                                           |
| MD200 B1        | 19950531 | LSPB | +     | published / reissued                                    |                                                           |
| MD200 B1        | 19951130 | LSGT | +FG4A | PATENT FOR INVENTION<br>ISSUED                          |                                                           |
| MD200 C2        | 19951130 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                 |                                                           |
| MD200 C2        | 20140506 | PEXP |       | Calculated Patent Term<br>Expiry                        |                                                           |
| MX171829 B      | 19931118 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                 |                                                           |
| MX171829 B      | 20071118 | PEXP |       | Calculated Patent Term<br>Expiry                        |                                                           |
| NO171489 B      | 19921214 | LSPB | +     | published / reissued                                    |                                                           |
| NO171489 C      | 19930324 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                 |                                                           |
| NO171489 C      | 20030901 | LSLE | -MM1K | LAPSED BY NOT PAYING<br>THE ANNUAL FEES                 | TEXT : LAPSED IN JULY<br>2003                             |
| NO171489 C      | 20090127 | PEXP |       | Calculated Patent Term<br>Expiry                        |                                                           |
| NO890363 A      | 19890731 | LSPB | +     | published / reissued                                    |                                                           |
| RU1813025 C     | 19930430 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                 |                                                           |
| RU1813025 C     | 20090118 | PEXP |       | Calculated Patent Term<br>Expiry                        |                                                           |
| SU1813025 A3    | 19930430 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                 |                                                           |
| US4964456 A     | 19901023 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                 |                                                           |
| US4964456 A     | 19890103 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER                                         |

|             |          |      |       |                                         |                                                                                                                                                                                                |
|-------------|----------|------|-------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |          |      |       |                                         | OWNER : LAREX AG,<br>SWITZERLAND<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS<br>INTEREST.;<br>ASSIGNOR: LAUENER,<br>WILHELM F.;<br>REEL/FRAME:005019/0608<br>EFFECTIVE DATE :<br>19881221         |
| US4964456 A | 19900821 | LSGT | PAT1  | Patented Case                           |                                                                                                                                                                                                |
| US4964456 A | 19900821 | LSGT | STCF  | INFORMATION ON<br>STATUS: PATENT GRANT  | TEXT : PATENTED CASE                                                                                                                                                                           |
| US4964456 A | 19920421 | LSRE | CC    | CERTIFICATE OF<br>CORRECTION            |                                                                                                                                                                                                |
| US4964456 A | 19940325 | LSFE | +FPAY | FEE PAYMENT                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                        |
| US4964456 A | 19980212 | LSFE | +FPAY | FEE PAYMENT                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                        |
| US4964456 A | 20020328 | LSFE | +FPAY | FEE PAYMENT                             | YEAR OF FEE PAYMENT :<br>12                                                                                                                                                                    |
| US4964456 A | 20030604 | LSAS | AS    | ASSIGNMENT                              | PARTYTYPE : OWNER<br>OWNER : ALCOA INC.,<br>PENNSYLVANIA<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR: LAREX A.G.;<br>REEL/FRAME:013699/0549<br>EFFECTIVE DATE :<br>20030602 |
| US4964456 A | 20090103 | PEXP |       | Calculated Patent Term<br>Expiry        |                                                                                                                                                                                                |
| ZA8900206 A | 19891025 | LSGT | +     | granted / extensions<br>(spc, cpc, pte) |                                                                                                                                                                                                |
| ZA8900206 A | 20090109 | PEXP |       | Calculated Patent Term<br>Expiry        |                                                                                                                                                                                                |

**Title:** METHOD FOR SECURING STRIP MEMBERS TO CONTAINER BODIES**Abstract:** ABSTRACT OF THE DISCLOSURE

A method and apparatus for adhesively securing a seam release strip to marginal end portion of a tubular container wherein the strip moves along a circular path of revolution and simultaneously with the movement of the strip, the container, rotating about its own axis, moves in a circular path of revolution tangential to the strip's path and axially aligned therewith so that a lateral edge of the strip is in substantial alignment with the marginal end portion of the container. An adhesive is applied to either the strip or the container in order that one will adhere to the other upon contact. The leading portion of the strip contacts the marginal end portion of the rotating container and adheres thereto. The container movement and rotation subsequent to the contracting causes the strip to leave its path of revolution and the remaining portion of the strip to adhere around the marginal end portion of the container. The length of the strip exceeds the circumference of the container causing a trailing portion of the strip to overlap the leading portion upon adherence of the strip to the marginal end portion of the container. The strip is then pressed against the container causing more intimate contact therewith. This invention relates to an apparatus and method for applying strips or tapes to container bodies or the like. 4 Although the invention may be utilized in applying a strip or tape of any desired type to any suitable container-like body, it is particularly adaptable for applying to container bodies plastic seam release strips which are adapted to be stripped from the sealed container to provide an easy opening feature. In such containers, a tubular container (body, which may be of any suitable type as, for example, a spirally wound body comprising a plurality of fibreboard body plies and a label ply made of aluminum foil or a coated paper, has a pull-out or seam release strip applied to the outside wall surface of the body adjacent one end of the latter. The strip is positioned on the body so that an edge portion of the strip is adapted to be mechanically enclosed within the end seam' securing the end closure or cover to the end of the container body which carries the strip. Thus, when a pull tab which is provided on the strip is manually grasped and pulled, the strip is peeled off the body and the strip edge within the end seam is withdrawn from the end seam as the strip is removed in one piece to thereby loosen the securement, of the end closure to the body for easy separation thereof.

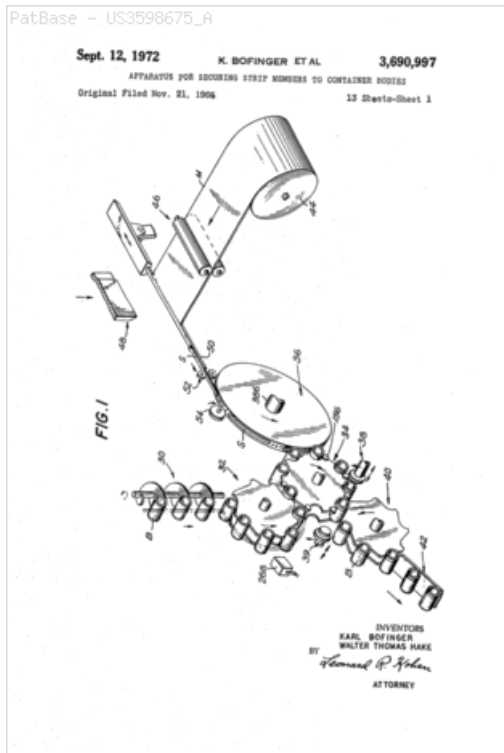
**Classifications:****International (IPC 8-9):** B31B1/90 B31C1/00

B65C3/12 (Advanced/Invention);

B31B1/74 B31C1/00 B65C3/00 (Core/Invention)

**International (IPC 1-7):** B31B3/60 B65B61/18 B65C3/06 B65C3/12 B65C9/02 B65H81/00**CPC:** B31C1/00 Y10T156/1062 Y10T156/1033 Y10T156/1771

B65C3/12 B31B50/811

**European:** B31B1/90 B31C1/00 B65C3/12 L31B201/90A**US:** 156/169 156/172 156/215 156/256 156/448 156/450 156/567**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US3598675 A        | 19710810         |                    | 19661121         |
| US3598675 B1       | 19900109         |                    | 00000000         |
| US3690997 A        | 19720912         | US19700074402      | 19700922         |

**Priority:**

US19660595809 19661121 US19660595809 19661121 US19700074402 19700922

**Probable Assignee:** AMERICAN NATIONAL CAN CO**Assignee(s):** (std): AMERICAN CAN CO ; AMERICAN NAT CAN CO ; AMERICAN NATIONAL CAN CO**Assignee(s):** AMERICAN CAN PACKAGING INC**Inventor(s):** (std): BOFINGER KARL ; HAKE WALTER THOMAS ; KARL BOFINGER ; WALTER T HAKE**Inventor(s):** WALTER THOMAS HAKE**Legal status (INPADOC)**

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| Patent      | Date recorded | Event group | Code | Event                                | Details |
|-------------|---------------|-------------|------|--------------------------------------|---------|
| US3598675 A | 19710810      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| US3690997 A | 19720912      | LSGT        | +    | granted / extensions                 |         |

| (spc, cpc, pte) |          |      |    |            |                                                                                                                                                                                                                                                                  |
|-----------------|----------|------|----|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US3690997 A     | 19870814 | LSAS | AS | ASSIGNMENT | OWNER NAME : AMERICAN CAN PACKAGING INC., CONNECTICUT<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:AMERICAN CAN COMPANY, A NJ CORP.;<br>REEL/FRAME:004835/0338<br>EFFECTIVE DATE : 19861107                                                       |
| US3690997 A     | 19870814 | LSAS | AS | ASSIGNMENT | OWNER NAME : AMERICAN CAN PACKAGING INC.,CONNECTICUT<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:AMERICAN CAN COMPANY, A NJ CORP.;<br>REEL/FRAME:4835/338<br>EFFECTIVE DATE : 19861107                                                           |
| US3690997 A     | 19870814 | LSAS | AS | ASSIGNMENT | OWNER NAME : AMERICAN NATIONAL CAN COMPANY, STATELESS<br>DESCRIPTION : MERGER;<br>ASSIGNORS:AMERICAN CAN PACKAGING INC.; TRAFALGAR INDUSTRIES, INC. (MERGED INTO); NATIONAL CAN CORPORATION (CHANGED TO);<br>REEL/FRAME:004835/0354<br>EFFECTIVE DATE : 19870430 |
| US3690997 A     | 19870814 | LSAS | AS | ASSIGNMENT | OWNER NAME : AMERICAN NATIONAL CAN COMPANY,STATELESS<br>DESCRIPTION : MERGER;<br>ASSIGNORS:AMERICAN CAN PACKAGING INC.; TRAFALGAR INDUSTRIES, INC. (MERGED INTO); NATIONAL CAN CORPORATION (CHANGED TO);<br>REEL/FRAME:4835/354<br>EFFECTIVE DATE : 19870430     |
| US3690997 A     | 19870814 | LSAS | AS | ASSIGNMENT | OWNER NAME : AMERICAN CAN PACKAGING INC., AMERICAN LANE, GREENW<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNOR:AMERICAN CAN COMPANY, A NJ CORP.;<br>REEL/FRAME:004835/0338<br>EFFECTIVE DATE : 19861107                                            |
| US3690997 A     | 19870814 | LSAS | AS | ASSIGNMENT | OWNER NAME : AMERICAN NATIONAL CAN COMPANY<br>DESCRIPTION : MERGER;<br>ASSIGNORS:AMERICAN CAN PACKAGING INC.; TRAFALGAR INDUSTRIES, INC. (MERGED INTO); NATIONAL CAN CORPORATION (CHANGED TO);<br>REEL/FRAME:004835/0354<br>EFFECTIVE DATE : 19870430            |

**Title:** PERFECTIONNEMENTS AUX PROCEDES ET DISPOSITIFS POUR LA PRODUCTION DE FILS TRES GONFLANTS ETIRABLES  
IMPROVEMENTS TO METHODS AND APPARATUS FOR PRODUCING VERY SON BLOWING stretch (Machine translation)

**Abstract:** Source: FR1458737A [FR] [Source: Claim 1] 1 Un procede, pour la production de fils tres gonflants etirables, consistant essentiellement a soumettre des articles filamenteux thermoplastiques a un crepage sur arete en utilisant au moins une arete placee dans de l'eau a une temperature superieure a 50 C et en plaçant lesdits articles filamenteux sous tension au contact de ladite arete d'une facon telle que le parcours de déplacement desdits articles filamenteux affecte un contour en forme de V au niveau de la position occupee par la ligne de contact avec l'arete; **Machine translation:** [Source: Claim 1] 1 a process for the production of bulking son very stretchable, essentially consisting of a penny to thermoplastic filamentous items creping on a ridge using at least an edge placed in water has a temperature above 50 C and placing said filamentous items energized contacts said arete a way such that the displacement path of said filamentous items affect a V-shaped contour at the position occupied by the contact line with the ridge;

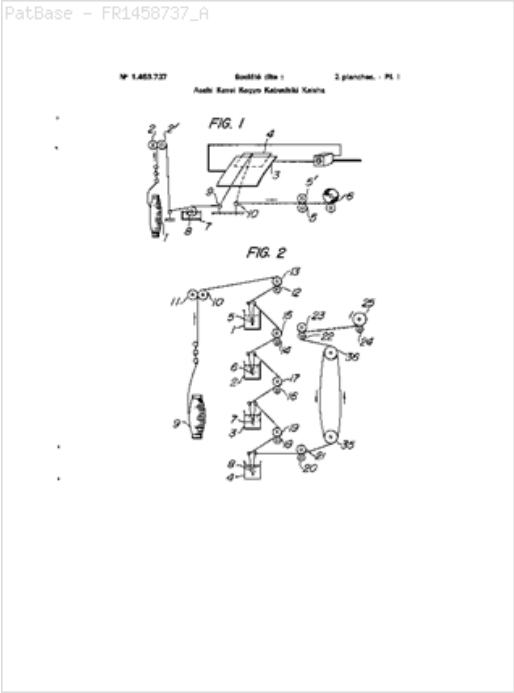
**Classifications:**

**International (IPC 8-9):** D02G1/10 (Advanced/Invention);

D02G1/10 (Core/Invention)

**CPC:** C10M3/00 D02G1/10

**European:** C10M3/00 D02G1/10



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| FR1458737 A        | 19660304         | FR19650034700      | 19651012         |

**Priority:**

FR19650034700 19651012

**Probable Assignee:** ASAHI CHEMICAL IND

**Assignee(s):** (std): ASAHI CHEMICAL IND

**Assignee(s):** ASAHI KASEI KOGYO KABUSHIKI KAISHA ; ASAHI KASEI KOGYO KK

**Legal status (INPADOC)**

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| Patent      | Date recorded | Event group | Code | Event                                | Details |
|-------------|---------------|-------------|------|--------------------------------------|---------|
| FR1458737 A | 19660304      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| FR1458737 A | 19851012      | PEXP        |      | Calculated Patent Term Expiry        |         |

**Title:** INTERMEDIATE MEMBER FOR LARGE-PARTICLE INKJET DEVELOPMENT

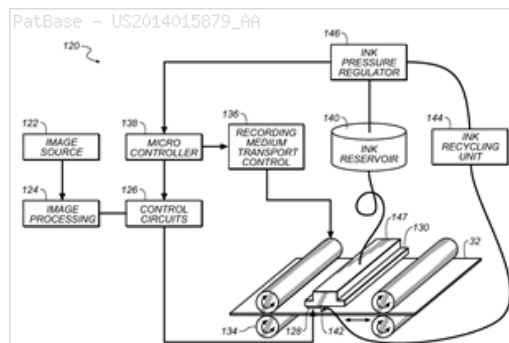
**Abstract:** Apparatus for producing a print on a recording medium includes a printhead adapted to provide drops of charged fluid. An intermediate member is adapted to receive the drops of charged fluid. A controller is adapted to receive image data for the print and control the printhead and the intermediate member so that a charged-fluid pattern corresponding to the image data is produced on the intermediate member. A development station is adapted to apply charged dry ink to the intermediate member bearing the charged-fluid pattern, so that a dry ink image corresponding to the image data is formed on the intermediate member. A transfer station is adapted to transfer the dry ink image from the intermediate member to the recording medium.

**Classifications:**

**International (IPC 8-9):** B41J29/38 (Advanced/Invention)

**CPC:** B41J2/085 B41J2/105 B41J2/02 B41J2002/012 B41J2/09

**US:** 347/9



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2014015879 AA    | 20140116         | US20120547411      | 20120712         |

**Priority:**

US20120547411 20120712

**Probable Assignee:** EASTMAN KODAK CO

**Assignee(s):** (std): MARCUS MICHAEL ALAN ; PANCHAWAGH HRISHIKESH V

**Assignee(s):** PAKON INC ; WILMINGTON TRUST NATIONAL ASSOCIATION AGENT AS ; KODAK REALTY INC ; LASER PACIFIC MEDIA CORP ; NPEC INC ; PFC INC ; QUALEX INC ; BANK OF AMERICA NA AGENT AS ; BARCLAYS BANK PLC ADMINISTRATIVE AGENT AS ; CREO MFG AMERICA LLC ; EASTMAN KODAK CO ; JPMORGAN CHASE BANK NA ADMINISTRATIVE AS ; FAR EAST DEVELOPMENT LTD ; KODAK AMERICAS LTD ; KODAK AVIATION LEASING LLC ; KODAK IMAGING NETWORK INC ; KODAK NEAR EAST INC ; KODAK PHILIPPINES LTD ; KODAK PORTUGUESA LTD

**Inventor(s):** (std): MARCUS MICHAEL ALAN ; PANCHAWAGH HRISHIKESH V

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code | Event                | Details                                                                                                                                                                                                                                                                                          |
|-----------------|---------------|-------------|------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2014015879 AA | 20140116      | LSPB        | +    | published / reissued |                                                                                                                                                                                                                                                                                                  |
| US2014015879 AA | 20120925      | LSAS        | AS   | ASSIGNMENT           | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY, NEW YORK<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:MARCUS, MICHAEL ALAN; PANCHAWAGH, HRISHIKESH V.;<br>SIGNING DATES FROM 20120812 TO 20120829; REEL/FRAME:029020/0886                                                    |
| US2014015879 AA | 20130401      | LSAS        | AS   | ASSIGNMENT           | PARTYTYPE : OWNER<br>OWNER : WILMINGTON TRUST, NATIONAL ASSOCIATION, AS AGENT,<br>OLDPARTY : PATENT SECURITY AGREEMENT; ASSIGNORS:EASTMAN KODAK COMPANY; PAKON, INC.;<br>REEL/FRAME:030122/0235<br>EFFECTIVE DATE : 20130322                                                                     |
| US2014015879 AA | 20130905      | LSAS        | AS   | ASSIGNMENT           | PARTYTYPE : OWNER<br>OWNER : JPMORGAN CHASE BANK, N.A., AS ADMINISTRATIVE, DELA<br>OLDPARTY : INTELLECTUAL PROPERTY SECURITY AGREEMENT (FIRST LIEN);<br>ASSIGNORS:EASTMAN KODAK COMPANY; FAR EAST DEVELOPMENT LTD.; FPC INC.; AND OTHERS;<br>REEL/FRAME:031158/0001<br>EFFECTIVE DATE : 20130903 |
| US2014015879 AA | 20130905      | LSAS        | AS   | ASSIGNMENT           | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY, NEW YORK<br>OLDPARTY : RELEASE OF SECURITY INTEREST IN PATENTS;<br>ASSIGNORS:CITICORP NORTH AMERICA, INC., AS SENIOR DIP AGENT; WILMINGTON TRUST, NATIONAL                                                                                   |

|                 |          |      |       |                                                                  |                                                                                                                                                                                                                                                                                                               |
|-----------------|----------|------|-------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       |                                                                  | ASSOCIATION, AS JUNIOR DIP AGENT;<br>REEL/FRAME:031157/0451<br>EFFECTIVE DATE : 20130903                                                                                                                                                                                                                      |
| US2014015879 AA | 20130905 | LSAS | AS    | ASSIGNMENT                                                       | PARTYTYPE : OWNER<br>OWNER : BANK OF AMERICA N.A., AS<br>AGENT, MASSACHUSETTS<br>OLDPARTY : INTELLECTUAL PROPERTY<br>SECURITY AGREEMENT (ABL);<br>ASSIGNORS:EASTMAN KODAK<br>COMPANY; FAR EAST DEVELOPMENT<br>LTD.; FPC INC.; AND OTHERS;<br>REEL/FRAME:031162/0117<br>EFFECTIVE DATE : 20130903              |
| US2014015879 AA | 20130905 | LSAS | AS    | ASSIGNMENT                                                       | PARTYTYPE : OWNER<br>OWNER : PAKON, INC., NEW YORK<br>OLDPARTY : RELEASE OF SECURITY<br>INTEREST IN PATENTS;<br>ASSIGNORS:CITICORP NORTH<br>AMERICA, INC., AS SENIOR DIP AGENT;<br>WILMINGTON TRUST, NATIONAL<br>ASSOCIATION, AS JUNIOR DIP AGENT;<br>REEL/FRAME:031157/0451<br>EFFECTIVE DATE : 20130903     |
| US2014015879 AA | 20130905 | LSAS | AS    | ASSIGNMENT                                                       | PARTYTYPE : OWNER<br>OWNER : BARCLAYS BANK PLC, AS<br>ADMINISTRATIVE AGENT, NEW YO<br>OLDPARTY : INTELLECTUAL PROPERTY<br>SECURITY AGREEMENT (SECOND LIEN);<br>ASSIGNORS:EASTMAN KODAK<br>COMPANY; FAR EAST DEVELOPMENT<br>LTD.; FPC INC.; AND OTHERS;<br>REEL/FRAME:031159/0001<br>EFFECTIVE DATE : 20130903 |
| US2014015879 AA | 20140923 | LSWD | -ABD3 | Abandoned -<br>- Failure to<br>Respond to<br>an Office<br>Action |                                                                                                                                                                                                                                                                                                               |
| US2014015879 AA | 20190730 | LSAS | AS    | ASSIGNMENT                                                       | PARTYTYPE : OWNER<br>OWNER : KODAK (NEAR EAST), INC.,<br>NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                          |
| US2014015879 AA | 20190730 | LSAS | AS    | ASSIGNMENT                                                       | PARTYTYPE : OWNER<br>OWNER : KODAK IMAGING NETWORK,<br>INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                      |
| US2014015879 AA | 20190730 | LSAS | AS    | ASSIGNMENT                                                       | PARTYTYPE : OWNER<br>OWNER : KODAK AMERICAS, LTD., NEW<br>YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                             |
| US2014015879 AA | 20190730 | LSAS | AS    | ASSIGNMENT                                                       | PARTYTYPE : OWNER<br>OWNER : KODAK PORTUGUESA<br>LIMITED, NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                         |
| US2014015879 AA | 20190730 | LSAS | AS    | ASSIGNMENT                                                       | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY,<br>NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                            |
| US2014015879 AA | 20190730 | LSAS | AS    | ASSIGNMENT                                                       | PARTYTYPE : OWNER<br>OWNER : QUALEX, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                                        |
| US2014015879 AA | 20190730 | LSAS | AS    | ASSIGNMENT                                                       | PARTYTYPE : OWNER<br>OWNER : NPEC, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED                                                                                                                                                                                                                            |

|                 |          |      |    |            |                                                                                                                                                                                                                                  |
|-----------------|----------|------|----|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |    |            | PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                                                         |
| US2014015879 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK PHILIPPINES, LTD., NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617         |
| US2014015879 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : CREO MANUFACTURING AMERICA LLC, NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617  |
| US2014015879 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : LASER PACIFIC MEDIA CORPORATION, NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617 |
| US2014015879 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK REALTY, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617              |
| US2014015879 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK AVIATION LEASING LLC, NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617      |
| US2014015879 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : FAR EAST DEVELOPMENT LTD., NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617       |
| US2014015879 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : PAKON, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                     |
| US2014015879 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : PFC, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                       |

**Title:** Improvements in methods of and apparatus for the production of glass or the like rod, filament, or tube

**Abstract:** 852,022. Glass manufacture. BRITISH HEAT RESISTING GLASS CO. Ltd. Dec. 10. 1956 [Dec. 10, 1955], No. 35536/55. Class 56. In order to avoid the formation of a twist in glass tube, rod, or filament when produced in apparatus imparting a rotation to the glass in advance of the drawing station, as described, for example in Specification 675,700, a rotation at the same speed and in the same direction is imparted at the drawing station by applying the drawing force helically with respect to the tube c. This is effected by so mounting the opposed drawing rollers that the axis of rotation of one roller may, to an adjustable extent, be downwardly inclined whilst the axis of the other roller is correspondingly upwardly inclined, as a result of which the planes of rotation of the rollers are displaced from the vertical as shown at F 1, F 2, Fig. 5. The horizontal components of the peripheral movements of the rollers impart a rotation to the glass tube 92 which is increased as the tilting of the roller axes is increased. Each roller 12 is carried on a spring-pressed pivoted arm 13 as described in Specification 852,021. and is driven through a cardan shaft 66, each shaft 22 being journaled in a self-aligning bearing 24 which allows the shaft to be inclined within a sleeve 18 projecting from a guide member 17 secured to arm 13. The tilting of the shaft 22 is effected by adjusting a bearing block 40 in the guide 17 by a bell crank 58, 59 and a nut and screw means 53, 56 which is operated by a hand wheel through universal joints and an extensible shaft 62. The tilt-adjusting means on both arms may be interconnected for operation by one handwheel. The block 40 houses a self-aligning bearing 47 and is coupled to the cardan shaft 66 by a universal joint 67. More than two rollers 12 may be arranged around the tube.

**Classifications:**

**International (IPC 8-9):** C03B15/14 (Advanced/Invention);

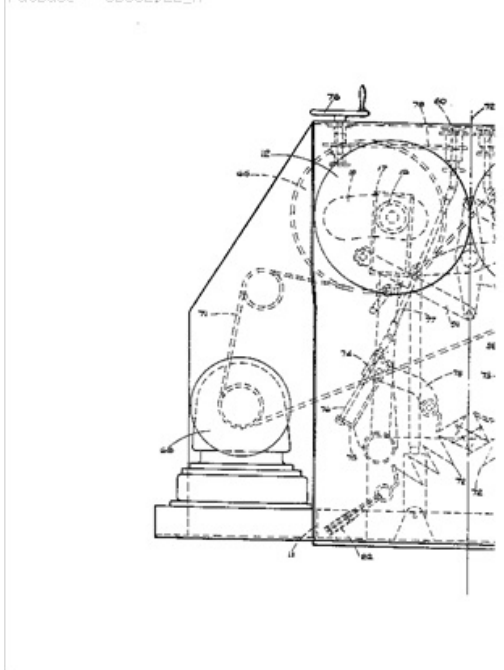
C03B15/00 (Core/Invention)

**International (IPC 1-7):** C03B15/14

**CPC:** C03B15/14

**European:** C03B15/14

PatBase - GB852022\_A



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| GB852022 A         | 19601019         | GB19550035536      | 19551210         |

**Priority:**

GB19550035536 19551210

**Probable Assignee:** BRITISH HEAT RESISTING GLASS C

**Assignee(s): (std):** BRITISH HEAT RESISTING GLASS C

**Assignee(s):** THE BRITISH HEAT RESISTING GLASS COMPANY LIMITED

**Inventor(s): (std):** HANN DOUGLAS GRAEME

**Legal status (INPADOC)**

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| Patent     | Date recorded | Event group | Code | Event                                | Details |
|------------|---------------|-------------|------|--------------------------------------|---------|
| GB852022 A | 19601019      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| GB852022 A | 19751210      | PEXP        |      | Calculated Patent Term Expiry        |         |



| GRANT       |          |      |    |            |                                                                                                                                                                                                                                 |
|-------------|----------|------|----|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US3872230 A | 19891115 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : ANACON FOODS COMPANY,<br>MINNESOTA<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS<br>INTEREST.; ASSIGNOR:FLAVOR TREE<br>FOODS, INC., A CORP. OF DE.;<br>REEL/FRAME:005181/0792<br>EFFECTIVE DATE : 19891024 |
| US3872230 A | 19891128 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : FLAVOR TREE FOODS, INC.<br>OLDPARTY : CHANGE OF NAME;<br>ASSIGNOR:A. SAHADI & CO., INC.;<br>REEL/FRAME:005201/0452<br>EFFECTIVE DATE : 19860122                                                    |
| US3872230 A | 19900511 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : FLAVOR TREE FOODS, INC.<br>OLDPARTY : CHANGE OF NAME;<br>ASSIGNOR:A. SAHADI & CO., INC.;<br>REEL/FRAME:005307/0680<br>EFFECTIVE DATE : 19900501                                                    |

**Title:** ADAMITE COMPOUND ROLL

**Abstract:** A compound roll for rolling composed of a shell made of adamite having a carbon content of 1.4-2.5 weight percent and a core made of forged or cast steel, the shell being metallurgically bonded to the core by casting an adamite melt around the already prepared core, and the shell having a large residual compressive stress. The adamite shell has a composition consisting essentially, by weight, of 1.4-2.5 percent of C, 0.6-0.8 percent of Si, 0.8-1.0 percent of Mn, 0.5-2.5 percent of Ni, 1.0-4.0 percent of Cr, 0.2-2.0 percent of Mo and the balance being essentially Fe. The residual compressive stress of the shell is desirably at least 20 kg/mm<sup>2</sup> so that cracks are effectively prevented from penetrating into the depths of the shell, thereby preventing the breakage of the compound roll at a roll body thereof.

**Classifications:**

**International (IPC 8-9):** B21B27/00 B22D19/16 C21D5/00

C21D9/38 (Advanced/Invention);

B21B27/00 B22D19/16 C21D5/00 C21D9/38 (Core/Invention)

**International (IPC 1-7):** B22D11/12 B22D19/00

**CPC:** C21D5/00 B21B27/00 B22D19/16 C21D9/38 Y10T29/49563

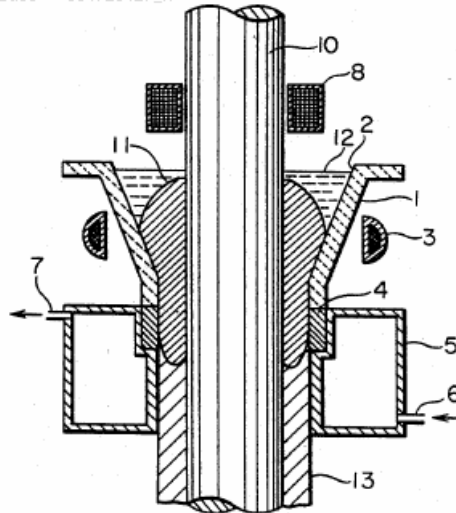
Y10T428/12965

**European:** B21B27/00 B22D19/16 C21D5/00 C21D9/38

**US:** 148/127 148/15.5 148/3 164/448 164/461 164/98 29/132

29/148.4D 29/895.32 420/108 420/15 428/683 492/3 492/54

PatBase - US4726417\_R



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US4726417 A        | 19880223         | US19860906405      | 19860912         |

**Priority:**

US19860906405 19860912

**Probable Assignee:** HITACHI METALS LTD 1 2 MARUNOUCHI A CORP OF JAPAN

**Assignee(s):** (std): HITACHI METALS LTD

**Assignee(s):** HITACHI METALS LTD 1 2 MARUNOUCHI A CORP OF JAPAN

**Inventor(s):** (std): SANO YOSHIKAZU

**Legal status (INPADOC)**

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| Patent      | Date recorded | Event group | Code  | Event                                | Details                                                                                                                                                                                                        |
|-------------|---------------|-------------|-------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US4726417 A | 19880223      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                |
| US4726417 A | 19860912      | LSAS        | AS    | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : HITACHI METALS, LTD., 1-2, MARUNOUCHI 2-CHOME, CHI<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNOR:SANO, YOSHIKAZU; REEL/FRAME:004599/0662<br>EFFECTIVE DATE : 19860830 |
| US4726417 A | 19860912      | LSAS        | AS    | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : HITACHI METALS, LTD., 1-2, MARUNOUCHI A CORP. OF J<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SANO, YOSHIKAZU; REEL/FRAME:004599/0662<br>EFFECTIVE DATE : 19860830  |
| US4726417 A | 19871223      | LSGT        | PAT1  | Patented Case                        |                                                                                                                                                                                                                |
| US4726417 A | 19871223      | LSGT        | STCF  | INFORMATION ON STATUS: PATENT GRANT  | TEXT : PATENTED CASE                                                                                                                                                                                           |
| US4726417 A | 19910416      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                        |
| US4726417 A | 19950807      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                        |
| US4726417 A | 19990816      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                       |

**Title:** LARGE-PARTICLE INKJET RECEIVER-CHARGING INTERMEDIATE MEMBER

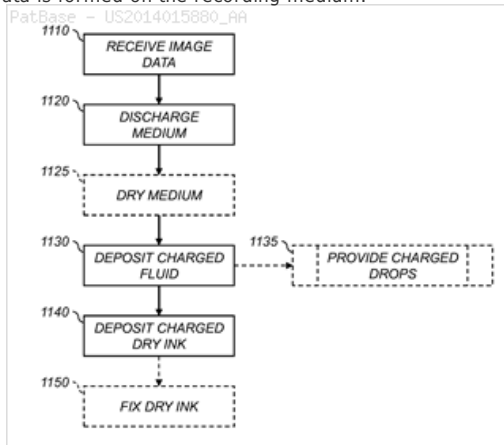
**Abstract:** Apparatus for producing a print on a recording medium includes a printhead providing drops of hydrophilic liquid. A hydrophobic drop-retention layer of an intermediate member receives the drops in cells including ion donors, forming a liquid pattern corresponding to image data. The ion donor in liquid-containing cells dissolves into ions. A transport member brings the recording medium into contact with the liquid pattern on the intermediate member. A voltage source applies a bias across the recording medium in contact with the liquid pattern to move ions to form a charge pattern corresponding to the liquid pattern on the recording medium. A development station applies charged dry ink to the recording medium bearing the charge pattern, so that a dry ink image corresponding to the image data is formed on the recording medium.

**Classifications:**

**International (IPC 8-9):** B41J2/41 B41J29/38 (Advanced/Invention)

**CPC:** B41J2/105

**US:** 347/103 347/112 347/154 347/9



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2014015880 AA    | 20140116         | US20120547473      | 20120712         |
| US8717395 BB       | 20140506         | US20120547473      | 20120712         |

**Priority:**

US20120547473 20120712

**Probable Assignee:** EASTMAN KODAK CO

**Assignee(s):** (std): EASTMAN KODAK CO ; MARCUS MICHAEL ALAN ; PANCHAWAGH HRISHIKESH V

**Assignee(s):** PAKON INC ; WILMINGTON TRUST NATIONAL ASSOCIATION AGENT AS ; MIDWEST ATHLETICS AND SPORTS ALLIANCE LLC ; KODAK REALTY INC ; LASER PACIFIC MEDIA CORP ; NPEC INC ; PFC INC ; QUALEX INC ; JPMORGAN CHASE BANK NA ADMINISTRATIVE AS ; FAR EAST DEVELOPMENT LTD ; KODAK AMERICAS LTD ; KODAK AVIATION LEASING LLC ; KODAK IMAGING NETWORK INC ; KODAK NEAR EAST INC ; KODAK PHILIPPINES LTD ; KODAK PORTUGUESA LTD ; BANK OF AMERICA NA AGENT AS ; BARCLAYS BANK PLC ADMINISTRATIVE AGENT AS ; CREO MFG AMERICA LLC

**Inventor(s):** (std): MARCUS MICHAEL ALAN ; PANCHAWAGH HRISHIKESH V

**Agent(s):** PEYTON C ; CHRISTOPHER J

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code | Event                                | Details                                                                                                                                                                                                                                       |
|-----------------|---------------|-------------|------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2014015880 AA | 20140116      | LSPB        | +    | published / reissued                 |                                                                                                                                                                                                                                               |
| US2014015880 AA | 20140416      | LSGT        | STCF | INFORMATION ON STATUS: PATENT GRANT  | TEXT : PATENTED CASE                                                                                                                                                                                                                          |
| US8717395 BB    | 20140506      | LSGT        | +    | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                                               |
| US8717395 BB    | 20120925      | LSAS        | AS   | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY, NEW YORK<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:MARCUS, MICHAEL ALAN; PANCHAWAGH, HRISHIKESH V.;<br>SIGNING DATES FROM 20120812 TO 20120829; REEL/FRAME:029021/0375 |
| US8717395 BB    | 20130401      | LSAS        | AS   | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : WILMINGTON TRUST, NATIONAL ASSOCIATION, AS AGENT,<br>OLDPARTY : PATENT SECURITY AGREEMENT; ASSIGNORS:EASTMAN KODAK COMPANY; PAKON, INC.;<br>REEL/FRAME:030122/0235<br>EFFECTIVE DATE : 20130322                  |
| US8717395 BB    | 20130905      | LSAS        | AS   | ASSIGNMENT                           | PARTYTYPE : OWNER                                                                                                                                                                                                                             |

|              |          |      |       |                         |                                                                                                                                                                                                                                                                                                      |
|--------------|----------|------|-------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       |                         | OWNER : BANK OF AMERICA N.A., AS AGENT, MASSACHUSETTS<br>OLDPARTY : INTELLECTUAL PROPERTY SECURITY AGREEMENT (ABL);<br>ASSIGNORS:EASTMAN KODAK COMPANY; FAR EAST DEVELOPMENT LTD.; FPC INC.; AND OTHERS;<br>REEL/FRAME:031162/0117<br>EFFECTIVE DATE : 20130903                                      |
| US8717395 BB | 20130905 | LSAS | AS    | ASSIGNMENT              | PARTYTYPE : OWNER<br>OWNER : JPMORGAN CHASE BANK, N.A., AS ADMINISTRATIVE, DELA<br>OLDPARTY : INTELLECTUAL PROPERTY SECURITY AGREEMENT (FIRST LIEN);<br>ASSIGNORS:EASTMAN KODAK COMPANY; FAR EAST DEVELOPMENT LTD.; FPC INC.; AND OTHERS;<br>REEL/FRAME:031158/0001<br>EFFECTIVE DATE : 20130903     |
| US8717395 BB | 20130905 | LSAS | AS    | ASSIGNMENT              | PARTYTYPE : OWNER<br>OWNER : BARCLAYS BANK PLC, AS ADMINISTRATIVE AGENT, NEW YO<br>OLDPARTY : INTELLECTUAL PROPERTY SECURITY AGREEMENT (SECOND LIEN);<br>ASSIGNORS:EASTMAN KODAK COMPANY; FAR EAST DEVELOPMENT LTD.; FPC INC.; AND OTHERS;<br>REEL/FRAME:031159/0001<br>EFFECTIVE DATE : 20130903    |
| US8717395 BB | 20130905 | LSAS | AS    | ASSIGNMENT              | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY, NEW YORK<br>OLDPARTY : RELEASE OF SECURITY INTEREST IN PATENTS;<br>ASSIGNORS:CITICORP NORTH AMERICA, INC., AS SENIOR DIP AGENT; WILMINGTON TRUST, NATIONAL ASSOCIATION, AS JUNIOR DIP AGENT; REEL/FRAME:031157/0451<br>EFFECTIVE DATE : 20130903 |
| US8717395 BB | 20130905 | LSAS | AS    | ASSIGNMENT              | PARTYTYPE : OWNER<br>OWNER : PAKON, INC., NEW YORK<br>OLDPARTY : RELEASE OF SECURITY INTEREST IN PATENTS;<br>ASSIGNORS:CITICORP NORTH AMERICA, INC., AS SENIOR DIP AGENT; WILMINGTON TRUST, NATIONAL ASSOCIATION, AS JUNIOR DIP AGENT; REEL/FRAME:031157/0451<br>EFFECTIVE DATE : 20130903           |
| US8717395 BB | 20140416 | LSGT | PAT1  | Patented Case           |                                                                                                                                                                                                                                                                                                      |
| US8717395 BB | 20171016 | LSFE | +MAFP | MAINTENANCE FEE PAYMENT | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                                                              |
| US8717395 BB | 20171128 | LSAS | AS    | ASSIGNMENT              | PARTYTYPE : OWNER<br>OWNER : MIDWEST ATHLETICS AND SPORTS ALLIANCE LLC, NEBRASK<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:EASTMAN KODAK COMPANY; REEL/FRAME:044811/0502<br>EFFECTIVE DATE : 20171120                                                                               |
| US8717395 BB | 20171207 | LSAS | AS    | ASSIGNMENT              | PARTYTYPE : OWNER<br>OWNER : MIDWEST ATHLETICS AND SPORTS ALLIANCE LLC, NEBRASK<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:EASTMAN KODAK COMPANY; REEL/FRAME:044811/0245<br>EFFECTIVE DATE : 20171120                                                                               |
| US8717395 BB | 20180119 | LSAS | AS    | ASSIGNMENT              | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY, NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:BANK OF AMERICA N.A.; REEL/FRAME:045095/0299<br>EFFECTIVE DATE : 20171115                                                                                                              |
| US8717395 BB | 20180119 | LSAS | AS    | ASSIGNMENT              | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY, NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK N.A.; REEL/FRAME:045095/0317<br>EFFECTIVE DATE : 20171115                                                                                                         |
| US8717395 BB | 20190730 | LSAS | AS    | ASSIGNMENT              | PARTYTYPE : OWNER<br>OWNER : KODAK IMAGING NETWORK, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE                                                                                                                                                                  |

|              |          |      |    |            |                                                                                                                                                                                                                                           |
|--------------|----------|------|----|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |    |            | BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRA:049901/0001<br>EFFECTIVE DATE : 20190617                                                                                                                                                 |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK AVIATION LEASING<br>LLC, NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRA:049901/0001<br>EFFECTIVE DATE : 20190617     |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK PORTUGUESA<br>LIMITED, NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRA:049901/0001<br>EFFECTIVE DATE : 20190617       |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : PFC, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRA:049901/0001<br>EFFECTIVE DATE : 20190617                         |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : CREO MANUFACTURING<br>AMERICA LLC, NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRA:049901/0001<br>EFFECTIVE DATE : 20190617 |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK PHILIPPINES, LTD.,<br>NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRA:049901/0001<br>EFFECTIVE DATE : 20190617        |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : PAKON, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRA:049901/0001<br>EFFECTIVE DATE : 20190617                       |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK (NEAR EAST), INC.,<br>NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRA:049901/0001<br>EFFECTIVE DATE : 20190617        |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : NPEC, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRA:049901/0001<br>EFFECTIVE DATE : 20190617                        |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK REALTY, INC., NEW<br>YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRA:049901/0001<br>EFFECTIVE DATE : 20190617             |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY,<br>NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRA:049901/0001<br>EFFECTIVE DATE : 20190617          |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : QUALEX, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRA:049901/0001                                                   |

|              |          |      |    |                                                      |                                                                                                                                                                                                                                              |
|--------------|----------|------|----|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |    |                                                      | EFFECTIVE DATE : 20190617                                                                                                                                                                                                                    |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT                                           | PARTYTYPE : OWNER<br>OWNER : KODAK AMERICAS, LTD.,<br>NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617            |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT                                           | PARTYTYPE : OWNER<br>OWNER : FAR EAST DEVELOPMENT<br>LTD., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617       |
| US8717395 BB | 20190730 | LSAS | AS | ASSIGNMENT                                           | PARTYTYPE : OWNER<br>OWNER : LASER PACIFIC MEDIA<br>CORPORATION, NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617 |
| US8717395 BB | 20320823 | PEXP |    | Calculated<br>Patent Term<br>Expiry (PTA<br>42 days) |                                                                                                                                                                                                                                              |

**Title:** Method and apparatus for performing horizontal continuous casting

**Abstract:** A horizontal continuous casting apparatus comprises, in one aspect, a tundish in which a **molten** metal material is stored, a mold assembly connected air-tightly to the tundish for casting a round billet, and an extraction device disposed on a downstream side of the mold assembly for forming a billet having a predetermined shape from the round billet fed from the mold assembly. The extraction device comprising a plurality of formation roll units arranged along a casting direction of the round billet and the formation roll units are composed of horizontal circular roll pairs, press units for pressing the roll pairs against the round billet and drive units for driving the roll pairs.

**Classifications:**

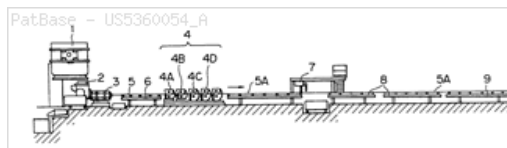
**International (IPC 8-9):** B21B1/46 B21B13/02 B21B15/00 B22D11/04 B22D11/12 B22D11/128 B22D11/20 (Advanced/Invention); B21B1/02 B21B1/04 B21B1/08 B21B1/12 B21B13/10 B21B13/22 B21B31/02 B21B31/26 B21B31/28 B21B45/00 (Advanced/Non-invention); B21B1/46 B21B13/00 B21B15/00 B22D11/04 B22D11/12 B22D11/128 B22D11/20 (Core/Invention); B21B1/00 B21B1/08 B21B31/00 B21B31/16 B21B45/00 (Core/Non-invention)

**International (IPC 1-7):** B22D11/00 B22D11/04 B22D11/12 B22D11/128 B22D11/20

**CPC:** B21B1/024 B21B1/04 B21B1/08 B21B1/12 B21B1/463 B21B1/466 B21B13/02 B21B13/10 B21B13/22 B21B15/0035 B21B31/26 B21B31/28 B21B45/004 B21B2031/025 B21B2203/22 B22D11/1206

**European:** B21B1/46C B21B13/02 B21B15/00F B22D11/12A L21B1/02F L21B1/04 L21B1/08 L21B1/12 L21B1/46N L21B13/02 L21B13/10 L21B13/22 L21B203/22 L21B31/02L L21B31/26 L21B31/28 L21B45/00H

**US:** 164/417 164/440 164/476 164/490



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE4234135 A1       | 19930415         | DE19924234135      | 19921009         |
| DE4234135 C2       | 20000105         | DE19924234135      | 19921009         |
| JP2527886 B2       | 19960828         | JP19920235485      | 19920903         |
| JP2814324 B2       | 19981022         | JP19910292192      | 19911011         |
| JP6079420 A2       | 19940322         | JP19920235485      | 19920903         |
| JP7024552 A2       | 19950127         | JP19910292192      | 19911011         |
| KR19930007544 A    | 19930520         | KR19920018701      | 19921012         |
| KR930007544 A      | 19930520         | KR19920018701      | 19921012         |
| KR960005879 B1     | 19960503         | KR19920018701      | 19921012         |
| US5360054 A        | 19941101         | US19920957040      | 19921006         |

**Priority:**

JP19910292192 19911011 JP19920235485 19920903

**Probable Assignee:** KAWASAKI JUKOGYO KABUSHIKI KAISHA

**Assignee(s):** (std): KAWASAKI HEAVY IND LTD ; KAWASAKI HEAVY IND K K

**Assignee(s):** KAWASAKI HEAVY IND KK ; KAWASAKI JUKOGYO K K ; KAWASAKI JUKOGYO KK ; KAWASAKI JUKOGYO KABUSHIKI KAISHA ; KAWASAKI JUKOGYO K K KOBE HYOGO JP ; KAWASAKI JUKOGYO K K KOBE

**Inventor(s):** (std): KANEKO HIDEO ; KUMASHIRO HATSUYOSHI ; KAMISHIRO HATSUYOSHI

**Inventor(s):** KUMASHIRO HATSUYOSHI KOBE HYOGO JP

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code  | Event                                                 | Details |
|--------------|---------------|-------------|-------|-------------------------------------------------------|---------|
| DE4234135 A1 | 19930415      | LSPB        | +     | published / reissued                                  |         |
| DE4234135 A1 | 19930415      | LSSES       | +OP8  | REQUEST FOR EXAMINATION AS TO PARAGRAPH 44 PATENT LAW |         |
| DE4234135 C2 | 20000105      | LSGT        | +     | granted / extensions (spc, cpc, pte)                  |         |
| DE4234135 C2 | 20000105      | LSGT        | +D2   | GRANT AFTER EXAMINATION                               |         |
| DE4234135 C2 | 20000629      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION               |         |
| DE4234135 C2 | 20060817      | LSLE        | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                  |         |
| DE4234135 C2 | 20121009      | PEXP        |       | Calculated Patent Term Expiry                         |         |
| JP2527886 B2 | 19960828      | LSGT        | +     | granted / extensions (spc, cpc, pte)                  |         |
| JP2527886 B2 | 20120903      | PEXP        |       | Calculated Patent Term Expiry                         |         |
| JP2814324 B2 | 19981022      | LSGT        | +     | granted / extensions (spc, cpc, pte)                  |         |

|                 |          |       |       |                                                                                     |                                                                                                                                                                                                                                           |
|-----------------|----------|-------|-------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP2814324 B2    | 20050814 | LSLE  | -LAPS | CANCELLATION<br>BECAUSE OF NO<br>PAYMENT OF<br>ANNUAL FEES                          |                                                                                                                                                                                                                                           |
| JP2814324 B2    | 20111011 | PEXP  |       | Calculated Patent<br>Term Expiry                                                    |                                                                                                                                                                                                                                           |
| JP6079420 A2    | 19940322 | LSPB  | +     | published /<br>reissued                                                             |                                                                                                                                                                                                                                           |
| JP7024552 A2    | 19950127 | LSPB  | +     | published /<br>reissued                                                             |                                                                                                                                                                                                                                           |
| KR19930007544 A | 19930520 | LSPB  | +     | published /<br>reissued                                                             |                                                                                                                                                                                                                                           |
| KR930007544 A   | 19930520 | LSPB  | +     | published /<br>reissued                                                             |                                                                                                                                                                                                                                           |
| KR960005879 B1  | 19960503 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)                                          |                                                                                                                                                                                                                                           |
| KR960005879 B1  | 19921012 | LSSES | A201  | REQUEST FOR<br>EXAMINATION                                                          |                                                                                                                                                                                                                                           |
| KR960005879 B1  | 19951227 | LSSES | -E902 | NOTIFICATION OF<br>REASON FOR<br>REFUSAL                                            |                                                                                                                                                                                                                                           |
| KR960005879 B1  | 19960410 | LSPB  | G160  | DECISION TO<br>PUBLISH PATENT<br>APPLICATION                                        |                                                                                                                                                                                                                                           |
| KR960005879 B1  | 19960801 | LSGT  | +E701 | DECISION TO<br>GRANT OR<br>REGISTRATION OF<br>PATENT RIGHT                          |                                                                                                                                                                                                                                           |
| KR960005879 B1  | 19961008 | LSGT  | +GRNT | WRITTEN DECISION<br>TO GRANT                                                        |                                                                                                                                                                                                                                           |
| KR960005879 B1  | 20060501 | LSFE  | FPAY  | ANNUAL FEE<br>PAYMENT                                                               | PAYMENT DATE : 20060502<br>YEAR OF FEE PAYMENT : 11                                                                                                                                                                                       |
| KR960005879 B1  | 20070504 | LSLE  | -LAPS | LAPSE DUE TO<br>UNPAID ANNUAL<br>FEE                                                |                                                                                                                                                                                                                                           |
| KR960005879 B1  | 20121012 | PEXP  |       | Calculated Patent<br>Term Expiry                                                    |                                                                                                                                                                                                                                           |
| US5360054 A     | 19941101 | LSGT  | +     | granted /<br>extensions (spc,<br>cpc, pte)                                          |                                                                                                                                                                                                                                           |
| US5360054 A     | 19921006 | LSAS  | AS    | ASSIGNMENT                                                                          | PARTYTYPE : OWNER<br>OWNER : KAWASAKI JUKOGYO<br>KABUSHIKI KAISHA, JAPAN<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST.;<br>ASSIGNORS:KANEKO, HIDEO;<br>KUMASHIRO, HATSUYOSHI;<br>REEL/FRAME:006272/0732<br>EFFECTIVE DATE : 19920924 |
| US5360054 A     | 19980501 | LSFE  | +FPAY | FEE PAYMENT                                                                         | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                   |
| US5360054 A     | 20021101 | LSLE  | -LAPS | LAPSE FOR FAILURE<br>TO PAY<br>MAINTENANCE FEES                                     |                                                                                                                                                                                                                                           |
| US5360054 A     | 20021204 | LSLE  | -PEX1 | Patent Expired Due<br>to NonPayment of<br>Maintenance Fees<br>Under 37 CFR<br>1.362 |                                                                                                                                                                                                                                           |
| US5360054 A     | 20021204 | LSLE  | -STCH | INFORMATION ON<br>STATUS: PATENT<br>DISCONTINUATION                                 | TEXT : PATENT EXPIRED DUE TO<br>NONPAYMENT OF MAINTENANCE<br>FEES UNDER 37 CFR 1.362                                                                                                                                                      |
| US5360054 A     | 20021231 | LSLE  | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE                                 | EFFECTIVE DATE : 20021101                                                                                                                                                                                                                 |
| US5360054 A     | 20121006 | PEXP  |       | Calculated Patent<br>Term Expiry                                                    |                                                                                                                                                                                                                                           |

**Title:** METHOD FOR MANUFACTURING RESIN SHAFT MEMBER, MOLD, AND **ROLLER SHAFT**

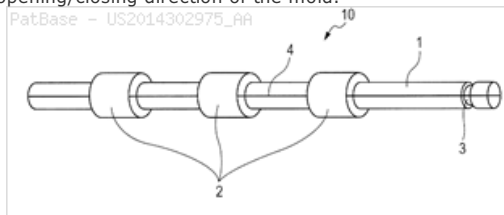
**Abstract:** A mold used to mold a resin **roller shaft** including a shaft portion and a roller joint portion configured to join a roller includes a plurality of cavities of different shapes for molding a roller joint portion. At least one of the plurality of cavities includes a space portion surrounded by a parting-free surface formed by an insert. The insert is larger in inner diameter than the shaft portion, and is movable by an ejector in the opening/closing direction of the mold.

**Classifications:**

**International (IPC 8-9):** B29C45/14 B29C45/32 B29C45/44 B65H27/00 (Advanced/Invention)

**CPC:** B65H2402/80 B29C44/04 B29C45/0025 B29C45/14065 B29C45/14598 B29C45/1615 B29C2045/0037 B29C2045/14139 B29L2031/75 B29C44/08 B29C45/14 B29C45/32 B65H27/00 B29C39/146 F16C2220/04

**US:** 264/241 264/255 264/45.1 425/588 492/39



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN104097291 A      | 20141015         | CN201410127266     | 20140401         |
| JP2014210429 A2    | 20141113         | JP20140076643      | 20140403         |
| US2014302975 AA    | 20141009         | US20140217734      | 20140318         |

**Priority:**

JP20130078494 20130404 JP20140076643 20140403

**Probable Assignee:** CANON INC

**Assignee(s):** (std): CANON INC ; CANON KK

**Inventor(s):** (std): ARAI TAKASHI

**Agent(s):** TAKAHASHI SEICHIRO; OCHI TAKAO; USUI SHINICHI; YOSHIZAWA HIROSHI; OKABE YUZURU

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                                                       | Details                                                                                                                                                                                        |
|-----------------|---------------|-------------|-------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CN104097291 A   | 20141015      | LSPB        | +     | published / reissued                                                        |                                                                                                                                                                                                |
| CN104097291 A   | 20141015      | LSPB        | +C06  | PUBLICATION                                                                 |                                                                                                                                                                                                |
| CN104097291 A   | 20170208      | LSDW        | -C02  | DEEMED WITHDRAWAL OF PATENT APPLICATION AFTER PUBLICATION (PATENT LAW 2001) |                                                                                                                                                                                                |
| JP2014210429 A2 | 20141113      | LSPB        | +     | published / reissued                                                        |                                                                                                                                                                                                |
| US2014302975 AA | 20141009      | LSPB        | +     | published / reissued                                                        |                                                                                                                                                                                                |
| US2014302975 AA | 20140709      | LSAS        | AS    | ASSIGNMENT                                                                  | PARTYTYPE : OWNER<br>OWNER : CANON KABUSHIKI KAISHA, JAPAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR: ARAI, TAKASHI;<br>REEL/FRAME: 033282/0001<br>EFFECTIVE DATE : 20140314 |
| US2014302975 AA | 20170106      | LSWD        | -ABD3 | Abandoned -- Failure to Respond to an Office Action                         |                                                                                                                                                                                                |

**Title:** Apparatus for the production of sheet profile and decorative glass (Machine translation)

**Abstract:** Source: RU2003101156A

**Machine translation:** (Claim 1) 1. Apparatus for producing a shaped sheet of glass, including a bath of **molten** metal and glass and tape across the width of tape over her glass shaped and cooled **rolling shaft**, wherein the **rolling shaft** consists of a water-cooled shaft and removable rings composing the same and / or different diameters of the same and / or widths, and the width of the bearing surface of the water-cooled shaft located and fixed on it removable rings has a length less than the width of the glass ribbon.

**Classifications:**

**International (IPC 8-9):** C03B18/12 (Advanced/Invention)

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| RU2003101156 A     | 20040710         | RU20030101156      | 20030115         |

**Legal status (INPADOC)**

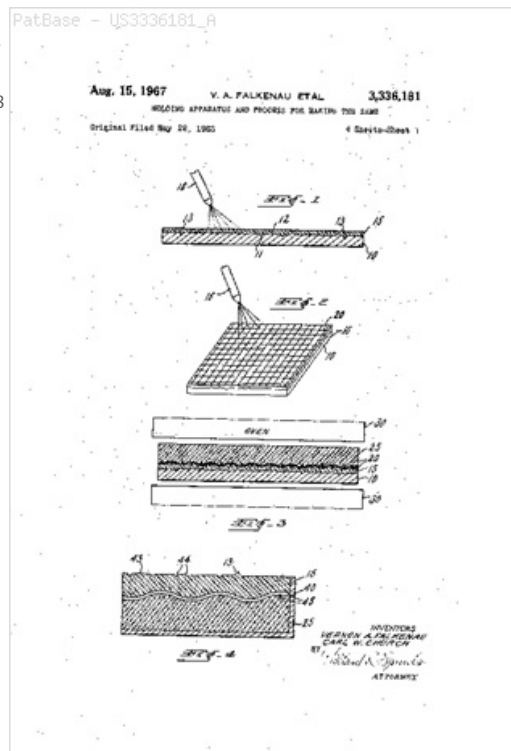
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| Patent         | Date recorded | Event group | Code | Event                | Details |
|----------------|---------------|-------------|------|----------------------|---------|
| RU2003101156 A | 20040710      | LSPB        | +    | published / reissued |         |

**Abstract:** 985,084. Rollers. UNITED STATES RUBBER CO. Feb. 28, 1964 [May 22, 1963], No. 8331/64. Heading F2U. [Also in Division B5] An embossing roller comprises an outer sheath 15 of porous metal and an inner sheath 25 of porous or non-porous metal or a resin of high distortion temperature heat shrunk or formed in situ upon a rotatable core 100. Longitudinal vacuum channels 45 located at the interface of the two layers are connected, via axially aligned bores 131 in plate 130, sealingly attached to said layers, with openings 122, 123 in a fixed commutator ring 120. The openings 122 and 123 are connected to a source of vacuum and pressure respectively so that as the roll rotates a channel first communicates with opening 122 and then with opening 123 thus first sucking the sheet to the roll to emboss it, then blowing it away from said roll to remove it. The porous metal layers are applied to the inside of a tubular former, the former removed and the layers heat shrunk on to the core, or are sprayed directly on to the core. Metals suitable for use are aluminium, low melting steels, bronze, copper, nickel and various suitable alloys.

**International (IPC 8-9):** B01D17/04 B01D19/04 B22C9/03 B29C1/02 B29C33/38 B29C51/36 B29C65/48 C23C4/02 C23C4/18 (Advanced/Invention); B01D17/04 B01D19/02 B22C9/02 B29C33/38 B29C51/30 B29C65/48 C23C4/02 C23C4/18 (Core/Invention)

**International (IC 1-7):** B29C1/00 B29C1/02 C10G33/04  
**CPC:** B01D17/047 B01D19/0413 B22C9/03 Y10S425/06  
Y10S425/812 B29C65/48 B29C33/3814 Y10T428/12042  
Y10T428/12479 Y10T428/12993 B29C51/365 C23C4/02 C23C4/18  
C23C4/185 Y10T29/4981 Y10T428/26 Y10T428/249981  
Y10T428/24999 Y10T428/249991 Y10T442/152 B29C66/0242  
**European:** B01D17/041 B01D19/04D4 B22C9/03 B29C33/38C  
B29C51/36B B29C65/48 C23C4/02 C23C4/18 C23C4/18B  
**US:** 208/188 29/423 425/1 425/117 425/175 425/385 425/388  
425/404 425/405.1 425/812 425/90 425/DIG.6 428/316.6  
428/319.1 428/319.3 428/332 428/332 428/550 428/613 428/687 442/31  
516/162 516/172 526/310 526/312 65/110 76/107.1



| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU4188064 A1       | 19650916         | AU19640041880      | 19640311         |
| BE646589 A         | 19640731         |                    | 19640415         |
| FR1392887 A        | 19650319         | FR19640970754      | 19640413         |
| GB985084 A         | 19650303         | GB19640008331      | 19640228         |
| LU45893 A          | 19640616         |                    | 19640416         |
| NL6402483 A        | 19641123         | NL19640002483      | 19640311         |
| SE307663 B         | 19690113         | SE19640003657      | 19640324         |
| US3262159 A        | 19660726         | US19630282443      | 19630522         |
| US3293737 A        | 19661227         | US19650484043      | 19650831         |
| US3316181 A        | 19670425         | US19650509431      | 19651123         |
| US336181 A         | 19670815         | US19660537436      | 19660325         |

US19630282443 19630522 US19650484043 19650831 US19650509431 19651123  
US19660537436 19660325

**Assignee(s):** NALCO CHEMICAL COMPANY ; UNITED STATES RUBBER CO ; UNITED STATES RUBBER COMPANY ; UNITED STATES RUBBER CO

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| Patent       | Date recorded | Event group | Code | Event                                | Details |
|--------------|---------------|-------------|------|--------------------------------------|---------|
| AU4188064 A1 | 19650916      | LSPB        | +    | published / reissued                 |         |
| BE646589 A   | 19640731      | LSPB        | +    | published / reissued                 |         |
| BE646589 A   | 19840415      | PEXP        |      | Calculated Patent Term Expiry        |         |
| FR1392887 A  | 19650319      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |

|             |          |      |   |                                      |
|-------------|----------|------|---|--------------------------------------|
| FR1392887 A | 19840413 | PEXP |   | Calculated Patent Term Expiry        |
| GB985084 A  | 19650303 | LSGT | + | granted / extensions (spc, cpc, pte) |
| GB985084 A  | 19840228 | PEXP |   | Calculated Patent Term Expiry        |
| LU45893 A   | 19640616 | LSGT | + | granted / extensions (spc, cpc, pte) |
| LU45893 A   | 19840417 | PEXP |   | Calculated Patent Term Expiry        |
| NL6402483 A | 19641123 | LSPB | + | published / reissued                 |
| SE307663 B  | 19690113 | LSPB | + | published / reissued                 |
| US3262159 A | 19660726 | LSGT | + | granted / extensions (spc, cpc, pte) |
| US3293737 A | 19661227 | LSGT | + | granted / extensions (spc, cpc, pte) |
| US3316181 A | 19670425 | LSGT | + | granted / extensions (spc, cpc, pte) |
| US3336181 A | 19670815 | LSGT | + | granted / extensions (spc, cpc, pte) |
| US3336181 A | 19860325 | PEXP |   | Calculated Patent Term Expiry        |

**Title:** ROLLER HEATING SYSTEM FOR A LAMINATING MACHINE AND PROCESS FOR PRODUCING **ROLLING SHAFT** THEREOF

**Abstract:** A roller heating system for a laminating machine comprises a first **rolling shaft** and a second **rolling shaft**, wherein the first **rolling shaft** and the second **rolling shaft** are parallel with each other, and a heating mechanism is mounted on the respective surface of the two **rolling shafts**. Then, a heat conduction layer wraps up the respective surface of the above-mentioned **rolling shafts** as well as the heating mechanisms. When the lamination proceeds, the heat mechanisms firstly heat the heat conduction layers to a working temperature and at the same time, the first and second **rolling shafts** respectively rotate in a predetermined direction, and then an article covered with laminating plastic films is fed into the roller heating system. The heat conduction layers heat the laminating plastic films to melt the fusion gum of the inner surfaces of the laminating plastic films, and subsequently the laminating plastic films are forced by the compression of the first and second **rolling shafts** to adhere to the article. Hence, not only good temperature control can be achieved and the lamination quality of the article can be ensured, but also the preheating time of the laminating machine can be shortened and the mechanical construction thereof can be simplified.

**Classifications:**

**International (IPC 8-9):** B65B25/14 H05B3/00 (Advanced/Invention);  
B32B38/00 (Advanced/Non-invention);  
H05B3/00 (Core/Invention);  
B32B38/00 (Core/Non-invention)

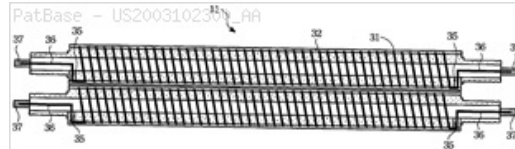
**International (IPC 1-7):** B32B3/00 B65B25/14 H05B3/00

**CPC:** B32B37/0053 B32B38/0036 B32B2037/0061 H05B3/0095

**European:** B32B31/00A4 B32B37/00C2 H05B3/00R L32B37/00C4

L32B38/00E

**US:** 156/583.1 219/244 219/469 492/46 492/46S



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| TW576818 B         | 20040221         | TW20010129683      | 20011130         |
| US2003102300 AA    | 20030605         | US20020128413      | 20020424         |
| US6791068 BB       | 20040914         | US20020128413      | 20020424         |

**Priority:**

TW20010129683 20011130

**Probable Assignee:** INTELLECTUAL VENTURES I LLC

**Assignee(s):** (std): PRIMAX ELECTRONICS LTD

**Assignee(s):** TRANSPACIFIC PLASMA LLC ; GIZMODO LIABILITY CO LTD ; INTELLECTUAL VENTURES I LLC

**Inventor(s):** (std): LIN SHIN FU

**Inventor(s):** SHIN-FU LIN

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                                   | Details                                                                                                                                                                                                   |
|-----------------|---------------|-------------|-------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TW576818 B      | 20040221      | LSGT        | +     | granted / extensions (spc, cpc, pte)                    |                                                                                                                                                                                                           |
| TW576818 B      | 20091201      | LSLE        | -MM4A | ANNULMENT OR LAPSE OF PATENT DUE TO NON-PAYMENT OF FEES |                                                                                                                                                                                                           |
| TW576818 B      | 20211130      | PEXP        |       | Calculated Patent Term Expiry                           |                                                                                                                                                                                                           |
| US2003102300 AA | 20030605      | LSPB        | +     | published / reissued                                    |                                                                                                                                                                                                           |
| US6791068 BB    | 20040914      | LSGT        | +     | granted / extensions (spc, cpc, pte)                    |                                                                                                                                                                                                           |
| US6791068 BB    | 20020424      | LSAS        | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : PRIMAX ELECTRONICS LTD., TAIWAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:LIN, SHIN-FU;<br>REEL/FRAME:012821/0092<br>EFFECTIVE DATE : 20020415             |
| US6791068 BB    | 20040826      | LSGT        | PAT1  | Patented Case                                           |                                                                                                                                                                                                           |
| US6791068 BB    | 20060712      | LSAS        | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : TRANSPACIFIC PLASMA, LLC, TAIWAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:PRIMAX ELECTRONICS LTD.;<br>REEL/FRAME:018047/0778<br>EFFECTIVE DATE : 20060626 |
| US6791068 BB    | 20060712      | LSAS        | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : TRANSPACIFIC PLASMA, LLC, TAIWAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:PRIMAX                                                                          |

|              |          |      |       |                                                                         |                                                                                                                                                                                                     |
|--------------|----------|------|-------|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       |                                                                         | ELECTRONICS LTD.;<br>REEL/FRAME:018047/0778<br>EFFECTIVE DATE : 20060626                                                                                                                            |
| US6791068 BB | 20070123 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : PRIMAX ELECTRONICS LTD., TAIWAN<br>OLDPARTY : LICENSE;<br>ASSIGNORS:TRANSPACIFIC IP LTD.; TRANSPACIFIC PLASMA LLC; REEL/FRAME:018787/0358<br>EFFECTIVE DATE : 20060404 |
| US6791068 BB | 20070123 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : PRIMAX ELECTRONICS LTD.,TAIWAN<br>OLDPARTY : LICENSE;<br>ASSIGNORS:TRANSPACIFIC IP LTD.; TRANSPACIFIC PLASMA LLC; REEL/FRAME:018787/0358<br>EFFECTIVE DATE : 20060404  |
| US6791068 BB | 20080221 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                             |
| US6791068 BB | 20110923 | LSFE | +FPAY | FEE PAYMENT                                                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                             |
| US6791068 BB | 20130617 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : GIZMOD0 LIMITED LIABILITY COMPANY, DELAWARE<br>OLDPARTY : MERGER;<br>ASSIGNOR:TRANSPACIFIC PLASMA, LLC;<br>REEL/FRAME:030628/0659<br>EFFECTIVE DATE : 20130213         |
| US6791068 BB | 20130618 | LSAS | AS    | ASSIGNMENT                                                              | PARTYTYPE : OWNER<br>OWNER : INTELLECTUAL VENTURES I LLC, DELAWARE<br>OLDPARTY : MERGER;<br>ASSIGNOR:GIZMOD0 LIMITED LIABILITY COMPANY;<br>REEL/FRAME:030639/0298<br>EFFECTIVE DATE : 20130214      |
| US6791068 BB | 20160914 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                               |                                                                                                                                                                                                     |
| US6791068 BB | 20161010 | LSLE | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362 |                                                                                                                                                                                                     |
| US6791068 BB | 20161010 | LSLE | -STCH | INFORMATION ON STATUS: PATENT DISCONTINUATION                           | TEXT : PATENT EXPIRED DUE TO NONPAYMENT OF MAINTENANCE FEES UNDER 37 CFR 1.362                                                                                                                      |
| US6791068 BB | 20161101 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                           | EFFECTIVE DATE : 20160914                                                                                                                                                                           |
| US6791068 BB | 20220718 | PEXP |       | Calculated Patent Term Expiry (PTA 85 days)                             |                                                                                                                                                                                                     |

**Title:** LARGE-PARTICLE INKJET DISCHARGED-AREA DEVELOPMENT PRINTING

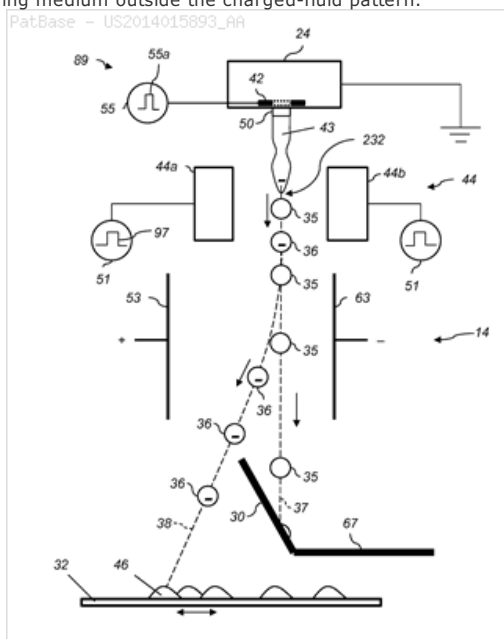
**Abstract:** A method of producing a print on a recording medium includes receiving image data for the print to be produced. A selected region of the recording medium is discharged. Charged fluid is deposited in a selected charged-fluid pattern corresponding to the image data on the selected region of the recording medium. Charged dry ink having charge of the opposite sign as the charge in the deposited charged-fluid pattern is deposited onto the recording medium. The deposited dry ink is repelled by the charged-fluid pattern and adheres to the recording medium outside the charged-fluid pattern.

**Classifications:**

**International (IPC 8-9):** B41J2/015 (Advanced/Invention)

**CPC:** B41J2/03 B41J2/105

**US:** 347/20



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2014015893 AA    | 20140116         | US20120547279      | 20120712         |

**Priority:**

US20120547279 20120712

**Probable Assignee:** EASTMAN KODAK CO

**Assignee(s):** (std): MARCUS MICHAEL ALAN ; PANCHAWAGH HRISHIKESH V

**Assignee(s):** PAKON INC ; WILMINGTON TRUST NATIONAL ASSOCIATION AGENT AS ; KODAK REALTY INC ; LASER PACIFIC MEDIA CORP ; NPEC INC ; PFC INC ; QUALEX INC ; BANK OF AMERICA NA AGENT AS ; BARCLAYS BANK PLC ADMINISTRATIVE AGENT AS ; CREO MFG AMERICA LLC ; EASTMAN KODAK CO ; JPMORGAN CHASE BANK NA ADMINISTRATIVE AS ; FAR EAST DEVELOPMENT LTD ; KODAK AMERICAS LTD ; KODAK AVIATION LEASING LLC ; KODAK IMAGING NETWORK INC ; KODAK NEAR EAST INC ; KODAK PHILIPPINES LTD ; KODAK PORTUGUESA LTD

**Inventor(s):** (std): MARCUS MICHAEL ALAN ; PANCHAWAGH HRISHIKESH V

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code | Event                | Details                                                                                                                                                                                                                                       |
|-----------------|---------------|-------------|------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2014015893 AA | 20140116      | LSPB        | +    | published / reissued |                                                                                                                                                                                                                                               |
| US2014015893 AA | 20120926      | LSAS        | AS   | ASSIGNMENT           | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY, NEW YORK<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:MARCUS, MICHAEL ALAN; PANCHAWAGH, HRISHIKESH V.;<br>SIGNING DATES FROM 20120812 TO 20120829; REEL/FRAME:029028/0652 |
| US2014015893 AA | 20130401      | LSAS        | AS   | ASSIGNMENT           | PARTYTYPE : OWNER<br>OWNER : WILMINGTON TRUST, NATIONAL ASSOCIATION, AS AGENT,<br>OLDPARTY : PATENT SECURITY AGREEMENT; ASSIGNORS:EASTMAN KODAK COMPANY; PAKON, INC.;<br>REEL/FRAME:030122/0235<br>EFFECTIVE DATE : 20130322                  |
| US2014015893 AA | 20130905      | LSAS        | AS   | ASSIGNMENT           | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY, NEW YORK<br>OLDPARTY : RELEASE OF SECURITY INTEREST IN PATENTS;<br>ASSIGNORS:CITICORP NORTH AMERICA, INC., AS SENIOR DIP AGENT;                                                           |

|                 |          |      |       |                                                         |                                                                                                                                                                                                                                                                                                   |
|-----------------|----------|------|-------|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       |                                                         | WILMINGTON TRUST, NATIONAL ASSOCIATION, AS JUNIOR DIP AGENT;<br>REEL/FRAME:031157/0451<br>EFFECTIVE DATE : 20130903                                                                                                                                                                               |
| US2014015893 AA | 20130905 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : BARCLAYS BANK PLC, AS ADMINISTRATIVE AGENT, NEW YO<br>OLDPARTY : INTELLECTUAL PROPERTY SECURITY AGREEMENT (SECOND LIEN);<br>ASSIGNORS:EASTMAN KODAK COMPANY; FAR EAST DEVELOPMENT LTD.; FPC INC.; AND OTHERS;<br>REEL/FRAME:031159/0001<br>EFFECTIVE DATE : 20130903 |
| US2014015893 AA | 20130905 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : BANK OF AMERICA N.A., AS AGENT, MASSACHUSETTS<br>OLDPARTY : INTELLECTUAL PROPERTY SECURITY AGREEMENT (ABL);<br>ASSIGNORS:EASTMAN KODAK COMPANY; FAR EAST DEVELOPMENT LTD.; FPC INC.; AND OTHERS;<br>REEL/FRAME:031162/0117<br>EFFECTIVE DATE : 20130903              |
| US2014015893 AA | 20130905 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : JPMORGAN CHASE BANK, N.A., AS ADMINISTRATIVE, DELA<br>OLDPARTY : INTELLECTUAL PROPERTY SECURITY AGREEMENT (FIRST LIEN);<br>ASSIGNORS:EASTMAN KODAK COMPANY; FAR EAST DEVELOPMENT LTD.; FPC INC.; AND OTHERS;<br>REEL/FRAME:031158/0001<br>EFFECTIVE DATE : 20130903  |
| US2014015893 AA | 20130905 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : PAKON, INC., NEW YORK<br>OLDPARTY : RELEASE OF SECURITY INTEREST IN PATENTS;<br>ASSIGNORS:CITICORP NORTH AMERICA, INC., AS SENIOR DIP AGENT; WILMINGTON TRUST, NATIONAL ASSOCIATION, AS JUNIOR DIP AGENT;<br>REEL/FRAME:031157/0451<br>EFFECTIVE DATE : 20130903     |
| US2014015893 AA | 20141125 | LSWD | -ABD3 | Abandoned -<br>- Failure to Respond to an Office Action |                                                                                                                                                                                                                                                                                                   |
| US2014015893 AA | 20190730 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : EASTMAN KODAK COMPANY, NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                            |
| US2014015893 AA | 20190730 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : KODAK IMAGING NETWORK, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                      |
| US2014015893 AA | 20190730 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : LASER PACIFIC MEDIA CORPORATION, NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                  |
| US2014015893 AA | 20190730 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : KODAK (NEAR EAST), INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                          |
| US2014015893 AA | 20190730 | LSAS | AS    | ASSIGNMENT                                              | PARTYTYPE : OWNER<br>OWNER : PAKON, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:JP MORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                                                                                      |

|                 |          |      |    |            |                                                                                                                                                                                                                                             |
|-----------------|----------|------|----|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2014015893 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : QUALEX, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                      |
| US2014015893 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK REALTY, INC., NEW<br>YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617             |
| US2014015893 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK PHILIPPINES, LTD.,<br>NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617        |
| US2014015893 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : FAR EAST DEVELOPMENT LTD.,<br>NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617      |
| US2014015893 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK AVIATION LEASING<br>LLC, NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617     |
| US2014015893 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : PFC, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                         |
| US2014015893 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK AMERICAS, LTD., NEW<br>YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617           |
| US2014015893 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : CREO MANUFACTURING<br>AMERICA LLC, NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617 |
| US2014015893 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : KODAK PORTUGUESA<br>LIMITED, NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617       |
| US2014015893 AA | 20190730 | LSAS | AS | ASSIGNMENT | PARTYTYPE : OWNER<br>OWNER : NPEC, INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED<br>PARTY; ASSIGNOR:JP MORGAN CHASE<br>BANK, N.A., AS ADMINISTRATIVE<br>AGENT; REEL/FRAME:049901/0001<br>EFFECTIVE DATE : 20190617                        |

**Title:** SYSTEM FOR AND METHOD OF BINDING AND TRIMMING A PERFECT BOUND BOOK

**Abstract:** A binder/trimmer is disclosed in which a book block is placed in a carriage, jogged to align the pages, and then transported to a milling station in which the spine of the book block is milled to roughen the spine, then to an adhesive application station at which a suitable adhesive is applied to the spine, and thence to a binding station at which the spine of the book is brought into engagement with the center portion of a cover and at which a binding clamp forces the cover against the outer faces of the book block proximate the spine, and then to a trimming station. At the trimming station, the book is deposited in a nest and is positioned relative to a trimming blade which is actuated to trim a first edge of the book to a predetermined dimension. The book is then rotated to trim second and third edges thus resulting in a perfect bound book accurately trimmed to a predetermined size. A method of binding and trimming a perfect bound book is also disclosed.

**Classifications:**

**International (IPC 8-9):** B23P15/28 B26D1/12 B26D5/02 B26D7/01 B26D7/06 B42B5/00 B42B9/00 B42C11/00 B42C11/02 B42C11/04 B42C19/02 B42C19/08 B42C5/00 B42C5/04 B42C9/00 B42C99/00 B65H37/04 (Advanced/Invention); B23P15/28 B26D5/02 B26D7/01 B26D7/06 B42C11/00 B42C9/00 (Core/Invention)

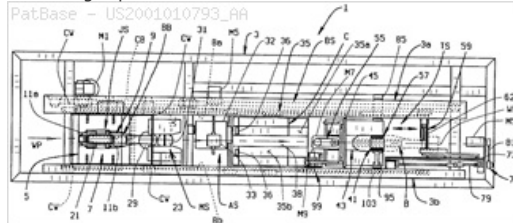
**International (IPC 1-7):** B23P15/28 B24C9/00 B26D1/12 B26D5/42 B26D7/06 B42B2/00 B42B5/00 B42B9/00 B42C B42C1/00 B42C11/00 B42C11/02 B42C9/00 B42D

**CPC:** B42C5/00 B42C9/0006 Y10S83/934 Y10S156/908 B42C9/0018

B26D5/02 B26D7/015 B26D2007/0056 B42C5/04 B42C11/02 B42C11/04 B42C19/02 B42P2261/04 Y10T156/1064 Y10T156/1744 Y10T156/1768 Y10T156/1771 Y10T83/6667

**European:** B26D5/02 B26D7/01C B42C11/02 B42C11/04 B42C19/02 B42C5/00 B42C5/04 B42C9/00B B42C9/00B1B L26D7/00C14 L42P261/04

**US:** 156/153 156/154 156/257 156/556 156/566 156/567 156/908 270/1.01 270/10.1 270/101 270/52.17 270/58.07 270/58.08 270/58.09 281/38 412/1 412/16 412/16P 412/19 412/1P 412/21 412/21S 412/25 412/25P 412/33 412/4 412/5 412/6 412/8 412/9 412/9P 83/733 83/934



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU200044683 A1     | 20001117         | AU20000044683      | 20000418         |
| AU200044683 A5     | 20001117         | AU20000044683D     | 20000418         |
| AU2002230900 AA    | 20020618         | AU20020230900      | 20011207         |
| AU2002366565 AA    | 20030623         | AU20020366565      | 20021114         |
| AU2002366565 AH    | 20030623         | AU20020366565      | 20021114         |
| CA2371594 AA       | 20011026         | CA20002371594      | 20000418         |
| CA2371594 C        | 20080129         | CA20002371594      | 20000418         |
| CA2430843 AA       | 20030609         | CA20012430843      | 20011207         |
| CA2430843 C        | 20100216         | CA20012430843      | 20011207         |
| CN1173837 C        | 20041103         | CN20008008200      | 20000418         |
| CN1353649 A        | 20020612         | CN20008008200      | 20000418         |
| DE60042973 D1      | 20091029         | DE20006042973      | 20000418         |
| DE60142633 D1      | 20100902         | DE20016042633      | 20011207         |
| EP1196296 A1       | 20020417         | EP20000926099      | 20000418         |
| EP1196296 A4       | 20050518         | EP20000926099      | 20000418         |
| EP1196296 B1       | 20090916         | EP20000926099      | 20000418         |
| EP1347864 A1       | 20031001         | EP20010991157      | 20011207         |
| EP1347864 A4       | 20070321         | EP20010991157      | 20011207         |
| EP1347864 B1       | 20100721         | EP20010991157      | 20011207         |
| ES2332646 T3       | 20100210         | ES20000926099T     | 20000418         |
| IL146224 A0        | 20020725         | IL20000146224      | 20000418         |
| IL146224 A1        | 20061210         | IL20000146224      | 20000418         |
| US2001010793 AA    | 20010802         | US20010793671      | 20010226         |
| US2002061238 AA    | 20020523         | US20010020266      | 20011207         |
| US2002064436 AA    | 20020530         | US20010017185      | 20011207         |
| US2006140743 AA    | 20060629         | US20060359975      | 20060221         |
| US2010266368 AA    | 20101021         | US20100660018      | 20100218         |
| US2012224937 AA    | 20120906         | US20120471210      | 20120514         |
| US6193458 BA       | 20010227         | US19990301918      | 19990429         |
| US6443682 BB       | 20020903         | US20010793671      | 20010226         |
| US6986630 BB       | 20060117         | US20010017185      | 20011207         |
| US7014182 BB       | 20060321         | US20010020266      | 20011207         |
| US7694947 BB       | 20100413         | US20060359975      | 20060221         |
| US8177212 BB       | 20120515         | US20100660018      | 20100218         |
| WO0066366 A1       | 20001109         | WO2000US10445      | 20000418         |
| WO0245923 A1       | 20020613         | WO2001US48590      | 20011207         |
| WO03049953 A2      | 20030619         | WO2002US36610      | 20021114         |
| WO03049953 A3      | 20031009         | WO2002US36610      | 20021114         |

**Priority:**

|                         |                         |                        |
|-------------------------|-------------------------|------------------------|
| US19990301918 19990429  | US19990301918 19990429  | WO2000US10445 20000418 |
| WO2000US10445 20000418  | US20000254106P 20001208 | US20010793671 20010226 |
| US20010281524P 20010404 | US20010017185 20011207  | US20010020266 20011207 |
| WO2001US48590 20011207  | WO2002US36610 20021114  | WO2002US36610 20021114 |
| US20060359975 20060221  | US20100660018 20100218  | US20120471210 20120514 |

**Probable Assignee:** PERFECT SYSTEMS LLC

**Assignee(s):** (std): JEFFREY D MARSH ; MARSH JEFFREY D ; PERFECT SYSTEMS LLC

**Inventor(s):** (std): JEFFREYINDINMARSH ; JEFFREY D MARSH ; MARSH JEFFREY D

**Inventor(s):** MARSH JEFFREY

**Agent(s):** BORDEN LADNER GERVAIS LLP; MACHTALERE GEORGES; GE EHRlich 1995 LTD; REINHOLD COHN AND PARTNERS; POLSTER LIEDER WOODRUFF AND LUCCHESI; POLSTER LIEDER WOODRUFF AND

**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 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 SD SE SG SI SK SL SN SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                                                                      | Details                                                                             |
|-----------------|---------------|-------------|-------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| AU200044683 A1  | 20001117      | LSPB        | +     | published / reissued                                                                       |                                                                                     |
| AU200044683 A5  | 20021010      | LSLE        | -MK1  | APPLICATION LAPSED SECTION 142(2)(A) - NO REQUEST FOR EXAMINATION IN RELEVANT PERIOD       |                                                                                     |
| AU2002230900 AA | 20020618      | LSPB        | +     | published / reissued                                                                       |                                                                                     |
| AU2002366565 AA | 20030623      | LSPB        | +     | published / reissued                                                                       |                                                                                     |
| AU2002366565 AA | 20040916      | LSLE        | -MK6  | APPLICATION LAPSED SECTION 142(2)(F)/REG. 8.3(3) - PCT APPLIC. NOT ENTERING NATIONAL PHASE |                                                                                     |
| CA2371594 AA    | 20011026      | LSPB        | +     | published / reissued                                                                       |                                                                                     |
| CA2371594 AA    | 20050405      | LSES        | +EEER | EXAMINATION REQUEST                                                                        |                                                                                     |
| CA2371594 C     | 20080129      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                       |                                                                                     |
| CA2371594 C     | 20200418      | PEXP        |       | Calculated Patent Term Expiry                                                              |                                                                                     |
| CA2430843 AA    | 20030609      | LSPB        | +     | published / reissued                                                                       |                                                                                     |
| CA2430843 AA    | 20061121      | LSES        | +EEER | EXAMINATION REQUEST                                                                        |                                                                                     |
| CA2430843 C     | 20100216      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                       |                                                                                     |
| CA2430843 C     | 20211207      | PEXP        |       | Calculated Patent Term Expiry                                                              |                                                                                     |
| CN1173837 C     | 20041103      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                       |                                                                                     |
| CN1173837 C     | 20041103      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL                                                           |                                                                                     |
| CN1173837 C     | 20200418      | PEXP        |       | Calculated Patent Term Expiry                                                              |                                                                                     |
| CN1353649 A     | 20020612      | LSPB        | +     | published / reissued                                                                       |                                                                                     |
| CN1353649 A     | 20020612      | LSPB        | +C06  | PUBLICATION                                                                                |                                                                                     |
| DE60042973 D1   | 20101007      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                                    |                                                                                     |
| EP1196296 A1    | 20020417      | LSPB        | +     | published / reissued                                                                       |                                                                                     |
| EP1196296 A1    | 20020417      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                                                              | EFFECTIVE DATE : 20011114                                                           |
| EP1196296 A1    | 20160630      | LSFE        | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                 | COUNTRY OF REF DOCUMENT : NL<br>PAYMENT DATE : 20160426<br>YEAR OF FEE PAYMENT : 17 |
| EP1196296 A1    | 20160729      | LSFE        | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                 | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20160427<br>YEAR OF FEE PAYMENT : 17 |
| EP1196296 A1    | 20160729      | LSFE        | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                 | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20160427<br>YEAR OF FEE PAYMENT : 17 |
| EP1196296 A1    | 20160729      | LSFE        | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                 | COUNTRY OF REF DOCUMENT : ES<br>PAYMENT DATE : 20160426<br>YEAR OF FEE PAYMENT : 17 |
| EP1196296 A1    | 20160831      | LSFE        | +PGFP | ANNUAL FEE PAID TO                                                                         | COUNTRY OF REF                                                                      |

|              |          |      |       |                                                                                        |                                                                                                                                                                                              |
|--------------|----------|------|-------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | NATIONAL OFFICE<br>[ANNOUNCED FROM<br>NATIONAL OFFICE TO<br>EPO]                       | DOCUMENT : FR<br>PAYMENT DATE :<br>20160425<br>YEAR OF FEE PAYMENT :<br>17                                                                                                                   |
| EP1196296 A1 | 20160831 | LSFE | +PGFP | ANNUAL FEE PAID TO<br>NATIONAL OFFICE<br>[ANNOUNCED FROM<br>NATIONAL OFFICE TO<br>EPO] | COUNTRY OF REF<br>DOCUMENT : BE<br>PAYMENT DATE :<br>20160427<br>YEAR OF FEE PAYMENT :<br>17                                                                                                 |
| EP1196296 A4 | 20050518 | LSES | +A4   | SUPPLEMENTARY SEARCH<br>REPORT DRAWN UP AND<br>DESPATCHED                              | EFFECTIVE DATE :<br>20050404                                                                                                                                                                 |
| EP1196296 A4 | 20080507 | LSES | +17Q  | FIRST EXAMINATION<br>REPORT DESPACHED                                                  | EFFECTIVE DATE :<br>20080407                                                                                                                                                                 |
| EP1196296 B1 | 20090916 | LSGT | +     | granted / extensions (spc,<br>cpc, pte)                                                |                                                                                                                                                                                              |
| EP1196296 B1 | 20090916 | LSGT | REG   | REFERENCE TO A<br>NATIONAL CODE                                                        | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE :<br>FG4D                                                                                                                                      |
| EP1196296 B1 | 20100210 | LSGT | REG   | REFERENCE TO A<br>NATIONAL CODE                                                        | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE :<br>FG2A<br>REF DOCUMENT NUMBER :<br>2332646<br>COUNTRY OF REF<br>DOCUMENT : ES<br>KIND CODE OF REF<br>DOCUMENT : T3<br>DESIGNATED STATE(S) : |
| EP1196296 B1 | 20100825 | LSGT | +26N  | NO OPPOSITION FILED                                                                    | EFFECTIVE DATE :<br>20100617                                                                                                                                                                 |
| EP1196296 B1 | 20160425 | LSFE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                        | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE :<br>PLFP<br>YEAR OF FEE PAYMENT :<br>17                                                                                                       |
| EP1196296 B1 | 20170426 | LSFE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                        | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE :<br>PLFP<br>YEAR OF FEE PAYMENT :<br>18                                                                                                       |
| EP1196296 B1 | 20170630 | LSFE | +PGFP | ANNUAL FEE PAID TO<br>NATIONAL OFFICE<br>[ANNOUNCED FROM<br>NATIONAL OFFICE TO<br>EPO] | COUNTRY OF REF<br>DOCUMENT : NL<br>PAYMENT DATE :<br>20170426<br>YEAR OF FEE PAYMENT :<br>18                                                                                                 |
| EP1196296 B1 | 20170731 | LSFE | +PGFP | ANNUAL FEE PAID TO<br>NATIONAL OFFICE<br>[ANNOUNCED FROM<br>NATIONAL OFFICE TO<br>EPO] | COUNTRY OF REF<br>DOCUMENT : GB<br>PAYMENT DATE :<br>20170427<br>YEAR OF FEE PAYMENT :<br>18                                                                                                 |
| EP1196296 B1 | 20170731 | LSFE | +PGFP | ANNUAL FEE PAID TO<br>NATIONAL OFFICE<br>[ANNOUNCED FROM<br>NATIONAL OFFICE TO<br>EPO] | COUNTRY OF REF<br>DOCUMENT : FR<br>PAYMENT DATE :<br>20170426<br>YEAR OF FEE PAYMENT :<br>18                                                                                                 |
| EP1196296 B1 | 20170731 | LSFE | +PGFP | ANNUAL FEE PAID TO<br>NATIONAL OFFICE<br>[ANNOUNCED FROM<br>NATIONAL OFFICE TO<br>EPO] | COUNTRY OF REF<br>DOCUMENT : DE<br>PAYMENT DATE :<br>20170427<br>YEAR OF FEE PAYMENT :<br>18                                                                                                 |
| EP1196296 B1 | 20170831 | LSFE | +PGFP | ANNUAL FEE PAID TO<br>NATIONAL OFFICE<br>[ANNOUNCED FROM<br>NATIONAL OFFICE TO<br>EPO] | COUNTRY OF REF<br>DOCUMENT : ES<br>PAYMENT DATE :<br>20170503<br>YEAR OF FEE PAYMENT :<br>18                                                                                                 |
| EP1196296 B1 | 20170831 | LSFE | +PGFP | ANNUAL FEE PAID TO<br>NATIONAL OFFICE<br>[ANNOUNCED FROM<br>NATIONAL OFFICE TO<br>EPO] | COUNTRY OF REF<br>DOCUMENT : BE<br>PAYMENT DATE :<br>20170427<br>YEAR OF FEE PAYMENT :<br>18                                                                                                 |

|              |          |       |       |                                                                            |                                                                                     |
|--------------|----------|-------|-------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| EP1196296 B1 | 20180425 | LSFE  | REG   | REFERENCE TO A NATIONAL CODE                                               | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 19    |
| EP1196296 B1 | 20180629 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : NL<br>PAYMENT DATE : 20180426<br>YEAR OF FEE PAYMENT : 19 |
| EP1196296 B1 | 20180731 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20180427<br>YEAR OF FEE PAYMENT : 19 |
| EP1196296 B1 | 20180731 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : ES<br>PAYMENT DATE : 20180503<br>YEAR OF FEE PAYMENT : 19 |
| EP1196296 B1 | 20180831 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20180425<br>YEAR OF FEE PAYMENT : 19 |
| EP1196296 B1 | 20180831 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : BE<br>PAYMENT DATE : 20180427<br>YEAR OF FEE PAYMENT : 19 |
| EP1196296 B1 | 20181031 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20180427<br>YEAR OF FEE PAYMENT : 19 |
| EP1196296 B1 | 20190628 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : NL<br>PAYMENT DATE : 20190426<br>YEAR OF FEE PAYMENT : 20 |
| EP1196296 B1 | 20190731 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : ES<br>PAYMENT DATE : 20190503<br>YEAR OF FEE PAYMENT : 20 |
| EP1196296 B1 | 20190731 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20190429<br>YEAR OF FEE PAYMENT : 20 |
| EP1196296 B1 | 20200418 | PEXP  |       | Calculated Patent Term Expiry                                              |                                                                                     |
| EP1347864 A1 | 20031001 | LSPB  | +     | published / reissued                                                       |                                                                                     |
| EP1347864 A1 | 20031001 | LSSES | +17P  | REQUEST FOR EXAMINATION FILED                                              | EFFECTIVE DATE : 20030701                                                           |
| EP1347864 A1 | 20150430 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20141224<br>YEAR OF FEE PAYMENT : 14 |
| EP1347864 A1 | 20160129 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20151229<br>YEAR OF FEE PAYMENT : 15 |
| EP1347864 A1 | 20160229 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO      | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20151217                             |

|              |          |       |       |                                                                                                 |                                                                                                                                                     |
|--------------|----------|-------|-------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |       |       | EPO]                                                                                            | YEAR OF FEE PAYMENT : 15                                                                                                                            |
| EP1347864 A1 | 20160229 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : NL<br>PAYMENT DATE : 20151226<br>YEAR OF FEE PAYMENT : 15                                                                 |
| EP1347864 A1 | 20160429 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20151229<br>YEAR OF FEE PAYMENT : 15                                                                 |
| EP1347864 A4 | 20070321 | LSSES | +A4   | SUPPLEMENTARY SEARCH REPORT DRAWN UP AND DESPATCHED                                             | EFFECTIVE DATE : 20070219                                                                                                                           |
| EP1347864 A4 | 20071226 | LSSES | +17Q  | FIRST EXAMINATION REPORT DESPATCHED                                                             | EFFECTIVE DATE : 20071128                                                                                                                           |
| EP1347864 B1 | 20100721 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                            |                                                                                                                                                     |
| EP1347864 B1 | 20100721 | LSGT  | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D                                                                                                |
| EP1347864 B1 | 20101103 | LSNP  | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : NL<br>REF LEGAL EVENT CODE : T3                                                                                                  |
| EP1347864 B1 | 20110629 | LSGT  | +26N  | NO OPPOSITION FILED                                                                             | EFFECTIVE DATE : 20110426                                                                                                                           |
| EP1347864 B1 | 20110818 | LSRE  | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R097<br>REF DOCUMENT NUMBER : 60142633<br>COUNTRY OF REF DOCUMENT : DE<br>EFFECTIVE DATE : 20110426 |
| EP1347864 B1 | 20151217 | 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                                    |
| EP1347864 B1 | 20161227 | 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 : 16                                    |
| EP1347864 B1 | 20161230 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : IT<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20151207                          |
| EP1347864 B1 | 20170131 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : NL<br>PAYMENT DATE : 20161226<br>YEAR OF FEE PAYMENT : 16                                                                 |
| EP1347864 B1 | 20170131 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20161228<br>YEAR OF FEE PAYMENT : 16                                                                 |
| EP1347864 B1 | 20170228 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20161227<br>YEAR OF FEE PAYMENT : 16                                                                 |
| EP1347864 B1 | 20170428 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM                                              | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE :                                                                                                      |

|              |          |      |       |                                                                                                 |                                                                                                                            |
|--------------|----------|------|-------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | NATIONAL OFFICE TO EPO]                                                                         | 20161229<br>YEAR OF FEE PAYMENT : 16                                                                                       |
| EP1347864 B1 | 20170831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : IT<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20151207 |
| EP1347864 B1 | 20170831 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20161222<br>YEAR OF FEE PAYMENT : 16                                        |
| EP1347864 B1 | 20170831 | LSRE | +PGRI | PATENT REINSTATED IN CONTRACTING STATE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                  | COUNTRY OF REF DOCUMENT : IT<br>REINSTATED DATE : 20170710                                                                 |
| EP1347864 B1 | 20171227 | LSFE | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 17                                           |
| EP1347864 B1 | 20180131 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20171227<br>YEAR OF FEE PAYMENT : 17                                        |
| EP1347864 B1 | 20180131 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : NL<br>PAYMENT DATE : 20171226<br>YEAR OF FEE PAYMENT : 17                                        |
| EP1347864 B1 | 20180228 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20171227<br>YEAR OF FEE PAYMENT : 17                                        |
| EP1347864 B1 | 20180430 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20171229<br>YEAR OF FEE PAYMENT : 17                                        |
| EP1347864 B1 | 20180531 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20171221<br>YEAR OF FEE PAYMENT : 17                                        |
| EP1347864 B1 | 20190228 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20181227<br>YEAR OF FEE PAYMENT : 18                                        |
| EP1347864 B1 | 20190228 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20181226<br>YEAR OF FEE PAYMENT : 18                                        |
| EP1347864 B1 | 20190430 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20181231<br>YEAR OF FEE PAYMENT : 18                                        |
| EP1347864 B1 | 20190430 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20181220<br>YEAR OF FEE PAYMENT : 18                                        |
| EP1347864 B1 | 20190430 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE                                                              | COUNTRY OF REF DOCUMENT : NL                                                                                               |

|                 |          |      |       |                                                           |                                                                                                                                                                                                               |
|-----------------|----------|------|-------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       | [ANNOUNCED FROM<br>NATIONAL OFFICE TO<br>EPO]             | PAYMENT DATE :<br>20181226<br>YEAR OF FEE PAYMENT :<br>18                                                                                                                                                     |
| EP1347864 B1    | 20211207 | PEXP |       | Calculated Patent Term<br>Expiry                          |                                                                                                                                                                                                               |
| ES2332646 T3    | 20100210 | LSGT | +     | granted / extensions (spc,<br>cpc, pte)                   |                                                                                                                                                                                                               |
| ES2332646 T3    | 20200418 | PEXP |       | Calculated Patent Term<br>Expiry                          |                                                                                                                                                                                                               |
| IL146224 A0     | 20070724 | LSGT | +FF   | PATENT GRANTED                                            |                                                                                                                                                                                                               |
| IL146224 A0     | 20070724 | LSFE | +KB   | PATENT RENEWED                                            |                                                                                                                                                                                                               |
| IL146224 A1     | 20061210 | LSPB | +     | published / reissued                                      |                                                                                                                                                                                                               |
| IL146224 A1     | 20101031 | LSFE | +KB   | PATENT RENEWED                                            |                                                                                                                                                                                                               |
| IL146224 A1     | 20140430 | LSFE | +KB   | PATENT RENEWED                                            |                                                                                                                                                                                                               |
| IL146224 A1     | 20180430 | LSFE | +KB   | PATENT RENEWED                                            |                                                                                                                                                                                                               |
| US2001010793 AA | 20010802 | LSPB | +     | published / reissued                                      |                                                                                                                                                                                                               |
| US2001010793 AA | 20020815 | LSGT | STCF  | INFORMATION ON<br>STATUS: PATENT GRANT                    | TEXT : PATENTED CASE                                                                                                                                                                                          |
| US2002061238 AA | 20020523 | LSPB | +     | published / reissued                                      |                                                                                                                                                                                                               |
| US2002061238 AA | 20060301 | LSGT | STCF  | INFORMATION ON<br>STATUS: PATENT GRANT                    | TEXT : PATENTED CASE                                                                                                                                                                                          |
| US2002064436 AA | 20020530 | LSPB | +     | published / reissued                                      |                                                                                                                                                                                                               |
| US2006140743 AA | 20060629 | LSPB | +     | published / reissued                                      |                                                                                                                                                                                                               |
| US2006140743 AA | 20071009 | LSAS | AS    | ASSIGNMENT                                                | PARTYTYPE : OWNER<br>OWNER : PERFECT<br>SYSTEMS, LLC, MISSOURI<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:MARSH,<br>JEFFREY D.;<br>REEL/FRAME:019930/0203<br>EFFECTIVE DATE :<br>20071003 |
| US2006140743 AA | 20071009 | LSAS | AS    | ASSIGNMENT                                                | PARTYTYPE : OWNER<br>OWNER : PERFECT<br>SYSTEMS, LLC,MISSOURI<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:MARSH,<br>JEFFREY D.;<br>REEL/FRAME:019930/0203<br>EFFECTIVE DATE :<br>20071003  |
| US2006140743 AA | 20100324 | LSGT | STCF  | INFORMATION ON<br>STATUS: PATENT GRANT                    | TEXT : PATENTED CASE                                                                                                                                                                                          |
| US2010266368 AA | 20101021 | LSPB | +     | published / reissued                                      |                                                                                                                                                                                                               |
| US2010266368 AA | 20120425 | LSGT | STCF  | INFORMATION ON<br>STATUS: PATENT GRANT                    | TEXT : PATENTED CASE                                                                                                                                                                                          |
| US2012224937 AA | 20120906 | LSPB | +     | published / reissued                                      |                                                                                                                                                                                                               |
| US2012224937 AA | 20130107 | LSWD | -ABD3 | Abandoned -- Failure to<br>Respond to an Office<br>Action |                                                                                                                                                                                                               |
| US6193458 BA    | 20010227 | LSGT | +     | granted / extensions (spc,<br>cpc, pte)                   |                                                                                                                                                                                                               |
| US6193458 BA    | 20010209 | LSGT | PAT1  | Patented Case                                             |                                                                                                                                                                                                               |
| US6193458 BA    | 20010209 | LSGT | STCF  | INFORMATION ON<br>STATUS: PATENT GRANT                    | TEXT : PATENTED CASE                                                                                                                                                                                          |
| US6193458 BA    | 20040702 | LSFE | +FPAY | FEE PAYMENT                                               | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                       |
| US6193458 BA    | 20071009 | LSAS | AS    | ASSIGNMENT                                                | PARTYTYPE : OWNER<br>OWNER : PERFECT<br>SYSTEMS, LLC, MISSOURI<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:MARSH,<br>JEFFREY D.;<br>REEL/FRAME:019930/0203<br>EFFECTIVE DATE :<br>20071003 |
| US6193458 BA    | 20071009 | LSAS | AS    | ASSIGNMENT                                                | PARTYTYPE : OWNER<br>OWNER : PERFECT<br>SYSTEMS, LLC,MISSOURI<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:MARSH,<br>JEFFREY D.;                                                            |

|              |          |      |       |                                                                                  |                                                                                                                                                                                                               |
|--------------|----------|------|-------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       |                                                                                  | REEL/FRAME:019930/0203<br>EFFECTIVE DATE :<br>20071003                                                                                                                                                        |
| US6193458 BA | 20080827 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                       |
| US6193458 BA | 20120827 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT :<br>12                                                                                                                                                                                   |
| US6193458 BA | 20190429 | PEXP |       | Calculated Patent Term<br>Expiry                                                 |                                                                                                                                                                                                               |
| US6443682 BB | 20020903 | LSGT | +     | granted / extensions (spc,<br>cpc, pte)                                          |                                                                                                                                                                                                               |
| US6443682 BB | 20020815 | LSGT | PAT1  | Patented Case                                                                    |                                                                                                                                                                                                               |
| US6443682 BB | 20060303 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                       |
| US6443682 BB | 20071009 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : PERFECT<br>SYSTEMS, LLC, MISSOURI<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:MARSH,<br>JEFFREY D.;<br>REEL/FRAME:019930/0203<br>EFFECTIVE DATE :<br>20071003 |
| US6443682 BB | 20071009 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : PERFECT<br>SYSTEMS, LLC,MISSOURI<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:MARSH,<br>JEFFREY D.;<br>REEL/FRAME:019930/0203<br>EFFECTIVE DATE :<br>20071003  |
| US6443682 BB | 20100303 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                       |
| US6443682 BB | 20140303 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT :<br>12                                                                                                                                                                                   |
| US6443682 BB | 20210226 | PEXP |       | Calculated Patent Term<br>Expiry (a terminal<br>disclaimer has been filed)       |                                                                                                                                                                                                               |
| US6986630 BB | 20060117 | LSGT | +     | granted / extensions (spc,<br>cpc, pte)                                          |                                                                                                                                                                                                               |
| US6986630 BB | 20071009 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : PERFECT<br>SYSTEMS, LLC, MISSOURI<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:MARSH,<br>JEFFREY D.;<br>REEL/FRAME:019930/0203<br>EFFECTIVE DATE :<br>20071003 |
| US6986630 BB | 20071009 | LSAS | AS    | ASSIGNMENT                                                                       | PARTYTYPE : OWNER<br>OWNER : PERFECT<br>SYSTEMS, LLC,MISSOURI<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:MARSH,<br>JEFFREY D.;<br>REEL/FRAME:019930/0203<br>EFFECTIVE DATE :<br>20071003  |
| US6986630 BB | 20090717 | LSFE | +FPAY | FEE PAYMENT                                                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                       |
| US6986630 BB | 20140117 | LSLE | -LAPS | LAPSE FOR FAILURE TO<br>PAY MAINTENANCE FEES                                     |                                                                                                                                                                                                               |
| US6986630 BB | 20140217 | LSLE | -PEX1 | Patent Expired Due to<br>NonPayment of<br>Maintenance Fees Under<br>37 CFR 1.362 |                                                                                                                                                                                                               |
| US6986630 BB | 20140217 | LSLE | -STCH | INFORMATION ON<br>STATUS: PATENT<br>DISCONTINUATION                              | TEXT : PATENT EXPIRED<br>DUE TO NONPAYMENT OF<br>MAINTENANCE FEES UNDER<br>37 CFR 1.362                                                                                                                       |
| US6986630 BB | 20140311 | LSLE | -FP   | EXPIRED DUE TO FAILURE<br>TO PAY MAINTENANCE FEE                                 | EFFECTIVE DATE :<br>20140117                                                                                                                                                                                  |
| US6986630 BB | 20221025 | PEXP |       | Calculated Patent Term<br>Expiry (PTA 322 days)                                  |                                                                                                                                                                                                               |

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| US7014182 BB | 20060321 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                           |                                                                                                                                                                                                               |
| US7014182 BB | 20060301 | LSGT | PAT1  | Patented Case                                                                                  |                                                                                                                                                                                                               |
| US7014182 BB | 20071009 | LSAS | AS    | ASSIGNMENT                                                                                     | PARTYTYPE : OWNER<br>OWNER : PERFECT<br>SYSTEMS, LLC, MISSOURI<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:MARSH,<br>JEFFREY D.;<br>REEL/FRAME:019930/0203<br>EFFECTIVE DATE :<br>20071003 |
| US7014182 BB | 20071009 | LSAS | AS    | ASSIGNMENT                                                                                     | PARTYTYPE : OWNER<br>OWNER : PERFECT<br>SYSTEMS, LLC,MISSOURI<br>OLDPARTY : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:MARSH,<br>JEFFREY D.;<br>REEL/FRAME:019930/0203<br>EFFECTIVE DATE :<br>20071003  |
| US7014182 BB | 20090921 | LSFE | +FPAY | FEE PAYMENT                                                                                    | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                       |
| US7014182 BB | 20130807 | LSFE | +FPAY | FEE PAYMENT                                                                                    | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                       |
| US7014182 BB | 20170822 | LSFE | +MAFP | MAINTENANCE FEE<br>PAYMENT                                                                     | YEAR OF FEE PAYMENT :<br>12                                                                                                                                                                                   |
| US7014182 BB | 20230731 | PEXP |       | Calculated Patent Term<br>Expiry (PTA 601 days and<br>a terminal disclaimer has<br>been filed) |                                                                                                                                                                                                               |
| US7694947 BB | 20100413 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                           |                                                                                                                                                                                                               |
| US7694947 BB | 20100324 | LSGT | PAT1  | Patented Case                                                                                  |                                                                                                                                                                                                               |
| US7694947 BB | 20130807 | LSFE | +FPAY | FEE PAYMENT                                                                                    | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                       |
| US7694947 BB | 20170912 | LSFE | +MAFP | MAINTENANCE FEE<br>PAYMENT                                                                     | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                       |
| US7694947 BB | 20261227 | PEXP |       | Calculated Patent Term<br>Expiry (PTA 309 days)                                                |                                                                                                                                                                                                               |
| US8177212 BB | 20120515 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                           |                                                                                                                                                                                                               |
| US8177212 BB | 20120425 | LSGT | PAT1  | Patented Case                                                                                  |                                                                                                                                                                                                               |
| US8177212 BB | 20151116 | LSFE | +FPAY | FEE PAYMENT                                                                                    | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                       |
| US8177212 BB | 20300630 | PEXP |       | Calculated Patent Term<br>Expiry (PTA 132 days)                                                |                                                                                                                                                                                                               |
| WO0066366 A1 | 20001109 | LSPB | +     | published / reissued                                                                           |                                                                                                                                                                                                               |
| WO0066366 A1 | 20000418 | LSNP | +WWE  | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE                                              | REF DOCUMENT NUMBER :<br>00808200.6<br>COUNTRY OF REF<br>DOCUMENT : CN                                                                                                                                        |
| WO0066366 A1 | 20011026 | LSNP | ENP   | ENTRY INTO THE<br>NATIONAL PHASE IN:                                                           | REF DOCUMENT NUMBER :<br>2371594<br>COUNTRY OF REF<br>DOCUMENT : CA                                                                                                                                           |
| WO0066366 A1 | 20011026 | LSNP | ENP   | ENTRY INTO THE<br>NATIONAL PHASE IN:                                                           | REF DOCUMENT NUMBER :<br>2371594<br>COUNTRY OF REF<br>DOCUMENT : CA<br>KIND CODE OF REF<br>DOCUMENT : A<br>DESIGNATED STATE(S) :                                                                              |
| WO0066366 A1 | 20011029 | LSNP | +WWE  | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE                                              | REF DOCUMENT NUMBER :<br>IN/PCT/2001/1123/KOL<br>COUNTRY OF REF<br>DOCUMENT : IN                                                                                                                              |
| WO0066366 A1 | 20011113 | LSNP | +WWE  | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE                                              | REF DOCUMENT NUMBER :<br>2000926099<br>COUNTRY OF REF<br>DOCUMENT : EP                                                                                                                                        |
| WO0066366 A1 | 20020228 | LSWD | REG   | REFERENCE TO NATIONAL<br>CODE                                                                  | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE :<br>8642                                                                                                                                                       |

|               |          |      |      |                                                       |                                                                        |
|---------------|----------|------|------|-------------------------------------------------------|------------------------------------------------------------------------|
| WO0066366 A1  | 20020417 | LSPB | +WWP | WIPO INFORMATION:<br>PUBLISHED IN NATIONAL<br>OFFICE  | REF DOCUMENT NUMBER :<br>2000926099<br>COUNTRY OF REF<br>DOCUMENT : EP |
| WO0066366 A1  | 20040121 | LSNE | NENP | NON-ENTRY INTO THE<br>NATIONAL PHASE IN:              | REF COUNTRY CODE : JP                                                  |
| WO0245923 A1  | 20020613 | LSPB | +    | published / reissued                                  |                                                                        |
| WO0245923 A1  | 20030609 | LSNP | +WWE | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE     | REF DOCUMENT NUMBER :<br>2430843<br>COUNTRY OF REF<br>DOCUMENT : CA    |
| WO0245923 A1  | 20030701 | LSNP | +WWE | WIPO INFORMATION:<br>ENTRY INTO NATIONAL<br>PHASE     | REF DOCUMENT NUMBER :<br>2001991157<br>COUNTRY OF REF<br>DOCUMENT : EP |
| WO0245923 A1  | 20031001 | LSPB | +WWP | WIPO INFORMATION:<br>PUBLISHED IN NATIONAL<br>OFFICE  | REF DOCUMENT NUMBER :<br>2001991157<br>COUNTRY OF REF<br>DOCUMENT : EP |
| WO0245923 A1  | 20031023 | LSWD | REG  | REFERENCE TO NATIONAL<br>CODE                         | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE :<br>8642                |
| WO0245923 A1  | 20060118 | LSNE | NENP | NON-ENTRY INTO THE<br>NATIONAL PHASE IN:              | REF COUNTRY CODE : JP                                                  |
| WO0245923 A1  | 20060118 | LSWD | -WWW | WIPO INFORMATION:<br>WITHDRAWN IN NATIONAL<br>OFFICE  | TEXT : JP                                                              |
| WO03049953 A2 | 20030619 | LSPB | +    | published / reissued                                  |                                                                        |
| WO03049953 A3 | 20050119 | LSNE | -122 | EP: PCT APPLICATION<br>NON-ENTRY IN EUROPEAN<br>PHASE | REF COUNTRY CODE : WO                                                  |
| WO03049953 A3 | 20060602 | LSNE | NENP | NON-ENTRY INTO THE<br>NATIONAL PHASE IN:              | REF COUNTRY CODE : JP                                                  |
| WO03049953 A3 | 20060602 | LSWD | -WWW | WIPO INFORMATION:<br>WITHDRAWN IN NATIONAL<br>OFFICE  | TEXT : JP                                                              |

**Title:** Method of forming color images by electrophotographic process employing a peelable transfer layer having a stratified structure

**Abstract:** A method of forming a color image by an electrophotographic process comprising forming a peelable transfer layer on a surface of an electrophotographic light-sensitive element, forming a toner image by an electrophotographic process on the transfer layer, heat-transferring the toner image together with the transfer layer onto a receiving material, wherein the transfer layer has a stratified structure composed of a first transfer layer (T1) which is contact with the surface of electrophotographic light-sensitive element and is formed by an electrodeposition coating method using thermoplastic resin grains (AR) each containing a resin (AH) having a glass transition point of from 20 DEG C. to 140 DEG C. or a softening point of from 30 DEG C. to 180 DEG C. and a resin (AL1) having a glass transition point of from -40 DEG C. to 40 DEG C. or a softening point of from 0 DEG C. to 60 DEG C. wherein the glass transition point or softening point of resin (AH) is at least 2 DEG C. higher than that of resin (AL1) and a second transfer layer (T2) provided thereon containing a resin (AL2) having a glass transition point of from -40 DEG C. to 35 DEG C. or a softening point of from 0 DEG C. to 45 DEG C. The method can provide color images of high accuracy and high quality without color shear in a simple and stable manner. Good color duplicates can be obtained at a low temperature of transfer or a high speed of transfer irrespective of the kind of receiving material. Color duplicates obtained are excellent in retouching property, sealing property and filing property.

**Classifications:**

**International (IPC 8-9):** G03G13/01 G03G15/01 G03G15/16

G03G5/147 G03G7/00 (Advanced/Invention);

G03G13/01 G03G15/01 G03G15/16 G03G5/147

G03G7/00 (Core/Invention)

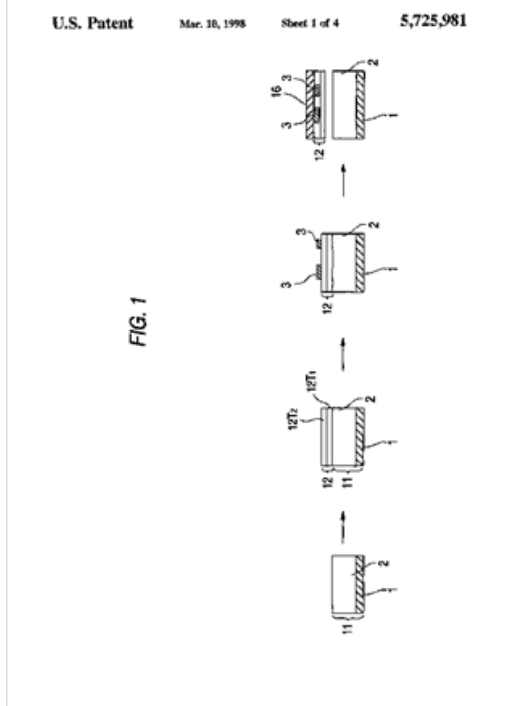
**International (IPC 1-7):** G03G13/14 G03G15/01 G03G15/16 G03G7/00

**CPC:** G03G5/147 G03G5/14786 G03G13/01

**European:** G03G13/01 G03G5/147 G03G5/147D2F

**US:** 430/125.31 430/126 430/47 430/47.3

PatBase - US5725981\_A



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP9106202 A2       | 19970422         | JP19960208632      | 19960807         |
| US5725981 A        | 19980310         | US19960692238      | 19960807         |

**Priority:**

JP19950222778 19950809 JP19960208632 19960807

**Probable Assignee:** FUJIFILM HOLDINGS CORP

**Assignee(s):** (std): FUJI PHOTO FILM CO LTD

**Assignee(s):** FUJIFILM CORP ; FUJIFILM HOLDINGS CORP

**Inventor(s):** (std): KATO EIICHI

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code  | Event                                | Details                                                                                                                                                                                       |
|--------------|---------------|-------------|-------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP9106202 A2 | 19970422      | LSPB        | +     | published / reissued                 |                                                                                                                                                                                               |
| US5725981 A  | 19980310      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                               |
| US5725981 A  | 19960807      | LSAS        | AS    | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : FUJI PHOTO FILM CO., LTD, JAPAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:KATO, EIICHI;<br>REEL/FRAME:008151/0366<br>EFFECTIVE DATE : 19960731 |
| US5725981 A  | 20010824      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                       |

|             |          |      |       |                                                                                     |                                                                                                                                                                                                                                                             |
|-------------|----------|------|-------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US5725981 A | 20050817 | LSFE | +FPAY | FEE PAYMENT                                                                         | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                     |
| US5725981 A | 20070215 | LSAS | AS    | ASSIGNMENT                                                                          | PARTYTYPE : OWNER<br>OWNER : FUJIFILM CORPORATION,<br>JAPAN<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:FUJIFILM HOLDINGS<br>CORPORATION (FORMERLY FUJI<br>PHOTO FILM CO., LTD.);<br>REEL/FRAME:018904/0001<br>EFFECTIVE DATE : 20070130 |
| US5725981 A | 20070215 | LSAS | AS    | ASSIGNMENT                                                                          | PARTYTYPE : OWNER<br>OWNER : FUJIFILM<br>CORPORATION,JAPAN<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:FUJIFILM HOLDINGS<br>CORPORATION (FORMERLY FUJI<br>PHOTO FILM CO., LTD.);<br>REEL/FRAME:018904/0001<br>EFFECTIVE DATE : 20070130  |
| US5725981 A | 20100310 | LSLE | -LAPS | LAPSE FOR FAILURE<br>TO PAY<br>MAINTENANCE FEES                                     |                                                                                                                                                                                                                                                             |
| US5725981 A | 20100405 | LSLE | -PEX1 | Patent Expired Due<br>to NonPayment of<br>Maintenance Fees<br>Under 37 CFR<br>1.362 |                                                                                                                                                                                                                                                             |
| US5725981 A | 20100405 | LSLE | -STCH | INFORMATION ON<br>STATUS: PATENT<br>DISCONTINUATION                                 | TEXT : PATENT EXPIRED DUE TO<br>NONPAYMENT OF MAINTENANCE FEES<br>UNDER 37 CFR 1.362                                                                                                                                                                        |
| US5725981 A | 20100427 | LSLE | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE                                 | EFFECTIVE DATE : 20100310                                                                                                                                                                                                                                   |
| US5725981 A | 20160807 | PEXP |       | Calculated Patent<br>Term Expiry                                                    |                                                                                                                                                                                                                                                             |

**Title:** METHOD OF MAKING A BRAKE SHOE

**Abstract:** A method of making a brake shoe having a curved table section and at least one rib section disposed on the concave side of the table section, generally including casting the brake shoe in a mold having cope and drag sections so that the axis of curvature of the table section thereof is disposed substantially parallel to the parting plane of the mold sections whereby no draft or parting ridge is formed on the outer curved surface of the table section.

**Classifications:**

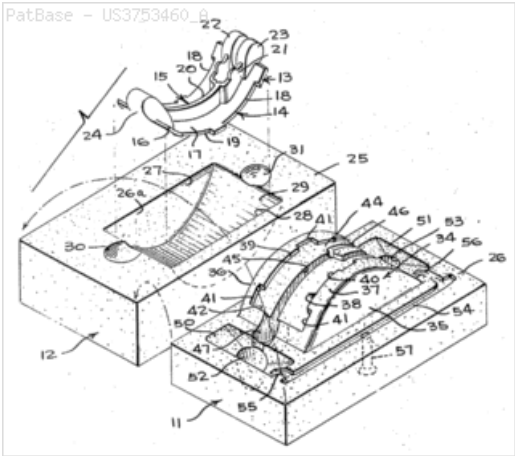
**International (IPC 8-9):** B22C9/22 B22C9/24 (Advanced/Invention); B22C9/22 (Core/Invention)

**International (IPC 1-7):** B22D23/00 B23P17/04

**CPC:** B22C9/22 B22C9/24 Y10T29/49988

**European:** 31C25 B22C9/22 B22C9/24

**US:** 148/540 148/543 148/549 164/13.1 164/131 164/332 164/363 164/365 188/257 188/258 29/527.5



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US3753460 A        | 19730821         | US19710174634      | 19710825         |
| US3877141 A        | 19750415         | US19740486671      | 19740705         |
| USRE29704 E        | 19780718         | US19760674319      | 19760407         |

**Priority:**

US19710174634 19710825      US19730366039 19730601      US19740486671 19740705

**Probable Assignee:** STANDARD FORGE AND AXLE COMPAN

**Assignee(s):** (std): STANDARD FORGE AND AXLE CO ; STANDARD FORGE AND AXLE COMPAN

**Assignee(s):** STANDARD FORGE AND AXLE CO INC ; STANDARD FORGE AND AXLE CO INC US

**Inventor(s):** (std): BRADSHAW H ; MCKENNEY H ; MCKENZIE R ; MCKENZIE ROLAND W ; MCKENNEY HUNTER R ; BRADSHAW HARRY

**Inventor(s):** BRADSHAW H US ; MCKENNEY H US ; MCKENZIE R US

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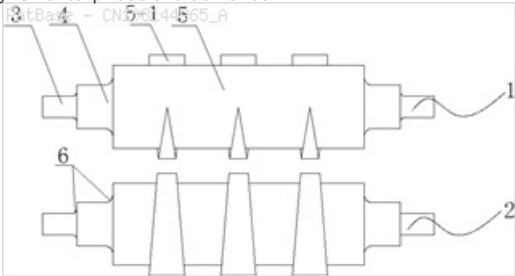
| Patent      | Date recorded | Event group | Code | Event                                | Details |
|-------------|---------------|-------------|------|--------------------------------------|---------|
| US3753460 A | 19730821      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| US3877141 A | 19750415      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |

**Title:** ROLLER APPLICABLE TO CROSS WEDGE **ROLLING SHAFT** TYPE PARTS AND PRODUCTION TECHNOLOGY

**Abstract:** The invention relates to a roller and a production technology, in particular to a roller applicable to cross wedge **rolling shaft** type parts and a production technology. The roller is prepared from chemical ingredients comprising 1.8-2.2 percent of C, 0.4-0.60 percent of Si, 0.8-1.2 percent of Mn, 0.03 percent or less of P, 0.025 percent or less of S, 1.2-1.6 percent of Cr, 1.6-2.0 percent of Ni, 0.6-0.8 percent of Mo, 0.2-0.4 percent of V, 0.2-0.4 percent of Nb and the balance Fe and a small amount of residual elements, then, two-furnace smelting is carried out, yttrium-based rare earth alterant is added, and a special heat treatment technology is carried out, so that the roller is obtained. The phenomenon that carbide exists in a discontinuous (granular) state is changed by optimally allocating the chemical ingredients, particularly adding niobium and vanadium, and the microscopic structure of the roller is improved. Meanwhile, by adding the yttrium-based heavy rare earth alterant for purifying **molten** steel in the steel melting process, the purity is improved, the comprehensive mechanical property of the roller is improved, the yield and quality of rolled products are improved, the service life of the roller is prolonged, and the purposes of cost decreasing and benefit increasing for enterprises are achieved.

**Classifications:**

**International (IPC 8-9):** B21B27/02 C21D8/06 C21D9/38 C22C33/04 C22C33/06 C22C38/02 C22C38/04 C22C38/44 C22C38/46 C22C38/48 C23C24/10 (Advanced/Invention)  
**CPC:** B21B27/028 C21D8/065 C21D9/38 C21D2211/008 C21D2211/009 C22C33/04 C22C33/06 C22C38/005 C22C38/02 C22C38/04 C22C38/44 C22C38/46 C22C38/48 C23C24/10



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN108144965 A      | 20180612         | CN201810007538     | 20180104         |

**Priority:**

CN201810007538 20180104

**Probable Assignee:** HUZHOU ZHONGHANG ROLL CO LTD

**Assignee(s):** (std): HUZHOU ZHONGHANG ROLL CO LTD

**Assignee(s):** HUZHOU CO LTD IN HANGZHOU ROLL ; HUZHOU ZHONGHANG ROLL CO

**Inventor(s):** (std): JIANG ZHIFANG ; LI WEI ; ZHOU MINGKUA

**Legal status (INPADOC)**

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| Patent        | Date recorded | Event group | Code | Event                | Details |
|---------------|---------------|-------------|------|----------------------|---------|
| CN108144965 A | 20180612      | LSPB        | +    | published / reissued |         |
| CN108144965 A | 20180612      | LSPB        | PB01 | PUBLICATION          |         |

**Title:** FUSING APPARATUS HAVING A PAPER SEPARATING UNIT

**Abstract:** A fusing apparatus 14 for fusing toner onto paper includes a heater roller 2 and a separating unit 15 with a separation claw 16. The separation claw 16 is provided with a paper guide member 17 having a curvature in a direction opposite to the curvature from a point a to a point c on the heater roller 2. After fusing, the front end 10a of the separated paper 10 is guided by the paper guide member 17. The paper guide member 17 reforms a curl imparted by the heating roller 2 curl into the original state, even if the paper 10 sticks to the heater roller 2 until the point c.

**Classifications:**

**International (IPC 8-9):** B65H29/54 G03G15/00

G03G15/20 (Advanced/Invention);

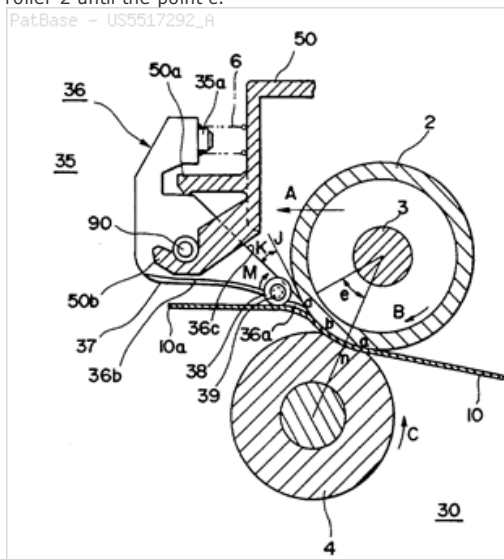
B65H29/54 G03G15/00 G03G15/20 (Core/Invention)

**International (IPC 1-7):** B65H29/54 G03G15/00 G03G15/20

**CPC:** Y10S271/90 G03G15/2028

**European:** G03G15/20H2P4

**US:** 271/900 355/285 355/315 399/323 399/333

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE4419304 A1       | 19941208         | DE19944419304      | 19940601         |
| GB2279039 A1       | 19941221         | GB19940010706      | 19940527         |
| GB2279039 B2       | 19970312         | GB19940010706      | 19940527         |
| GB9410706 A0       | 19940713         | GB19940010706      | 19940527         |
| JP7049633 A2       | 19950221         | JP19940108529      | 19940523         |
| US5517292 A        | 19960514         | US19940250779      | 19940527         |

**Priority:**

JP19930130172 19930601 JP19940108529 19940523

**Probable Assignee:** OKI ELECTRIC IND CO LTD

**Assignee(s):** (std): OKI ELECTRIC IND CO LTD

**Assignee(s):** OKI ELECTRIC INDUSTRY CO LIMITED ; OKI ELECTRIC INDUSTRY CO LTD ; OKI ELECTRIC INDUSTRY CO LTD TOKIO TOKYO JP ; OKI ELECTRIC IND ; OKI ELECTRIC IND CO

**Inventor(s):** (std): YAJIMA HIROYUKI ; ITAYA TAKASHI

**Inventor(s):** TAKASHI ITAYA ; HIROYUKI YAJIMA ; YAJIMA HIROYUKI TOKIO TOKYO JP ; ITAYA TAKASHI TOKIO TOKYO JP

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code  | Event                                        | Details                                                             |
|--------------|---------------|-------------|-------|----------------------------------------------|---------------------------------------------------------------------|
| DE4419304 A1 | 19941208      | LSPB        | +     | published / reissued                         |                                                                     |
| DE4419304 A1 | 20010104      | LSAS        | 8127  | NEW PERSON/NAME/ADDRESS OF THE APPLICANT     | PARTYTYPE : OWNER<br>OWNER : OKI DATA CORP., TOKIO/TOKYO, JP        |
| DE4419304 A1 | 20010830      | LSLE        | -8141 | DISPOSAL/NO REQUEST FOR EXAMINATION          |                                                                     |
| GB2279039 A1 | 19941221      | LSPB        | +     | published / reissued                         |                                                                     |
| GB2279039 B2 | 19970312      | LSGT        | +     | granted / extensions (spc, cpc, pte)         |                                                                     |
| GB2279039 B2 | 20140618      | LSLE        | -PE20 | PATENT EXPIRED AFTER TERMINATION OF 20 YEARS | EXPIRY DATE : 20140526                                              |
| GB2279039 B2 | 20140526      | PEXP        |       | Calculated Patent Term Expiry                |                                                                     |
| JP7049633 A2 | 19950221      | LSPB        | +     | published / reissued                         |                                                                     |
| US5517292 A  | 19960514      | LSGT        | +     | granted / extensions (spc, cpc, pte)         |                                                                     |
| US5517292 A  | 19940701      | LSAS        | AS    | ASSIGNMENT                                   | PARTYTYPE : OWNER<br>OWNER : OKI ELECTRIC INDUSTRY CO., LTD., JAPAN |

OLDPARTY : ASSIGNMENT OF  
ASSIGNORS INTEREST;  
ASSIGNORS:YAJIMA, HIROYUKI;  
ITAYA, TAKASHI;  
REEL/FRAME:007063/0741  
EFFECTIVE DATE : 19940623

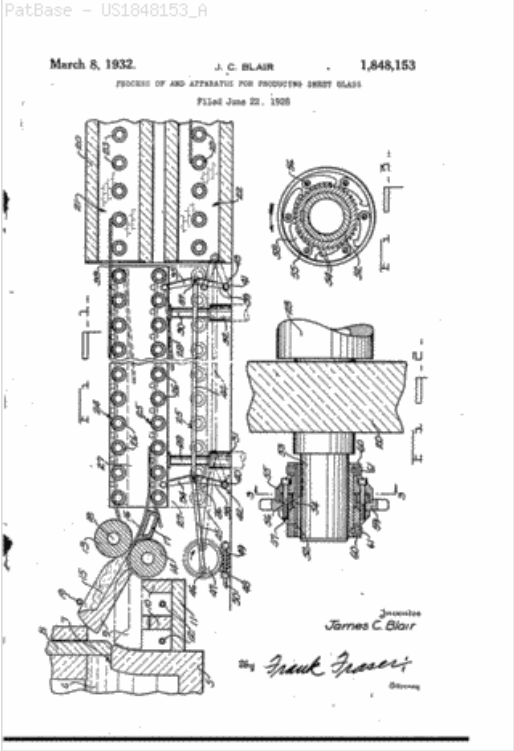
|             |          |      |       |                                           |                          |
|-------------|----------|------|-------|-------------------------------------------|--------------------------|
| US5517292 A | 19960503 | LSGT | PAT1  | Patented Case                             |                          |
| US5517292 A | 19960503 | LSGT | STCF  | INFORMATION ON<br>STATUS: PATENT<br>GRANT | TEXT : PATENTED CASE     |
| US5517292 A | 19991108 | LSFE | +FPAY | FEE PAYMENT                               | YEAR OF FEE PAYMENT : 4  |
| US5517292 A | 20031015 | LSFE | +FPAY | FEE PAYMENT                               | YEAR OF FEE PAYMENT : 8  |
| US5517292 A | 20071019 | LSFE | +FPAY | FEE PAYMENT                               | YEAR OF FEE PAYMENT : 12 |
| US5517292 A | 20140527 | PEXP |       | Calculated Patent Term<br>Expiry          |                          |

Title: PROCESS OF AND APPARATUS FOR PRODUCING SHEET GLASS

**Abstract:** \_ 1, claim: y "1. In apparatus for the manufacture of sheet glass, a plurality of superimposed conveying tables movable vertically alternately to s. sheet receiving position and a sheet delivering position, means for intermittently forming successive sheets of glass and in passing each sheet onto one of the tables when said table is in reeeivlng position, and an annealing leer for receiving the sheet from the table when said table is in delivering position; EZQ In apparatus for the manufacture of sheet glass, u plurality uf superimposed conveying tables rnovnble alternately to a sheet receiving position and a sheet delivering position, means for intermittently forming successive sheets of glass and passing each sheet onto one of the tables in receiving position, and an annealing leer for receiving the sheet from the table when in delivering position. 3. In apparatus for the manufacture of sheet glass, I1 plurality of superimposed conveyinfr tables,.one of said tables being maintained, in u, sheet delivering position while the other is maintained in a sheet receiving position, means for intermittently forming successive sheets of glass and passing each sheet onto one of the tables in receiving position, and an annealing leer for receiving the sheet from the table when in delivering position. 4. In apparatus for the manufacture of sheet glass, an annealing leer including a plurality of superimposed annealin sections, sheet forming means, a. plurality ogsuperimposed conveying tables positioned between said leer and forming means, and means for adjusting said conveying tables vertically as B unit to bring one of said tables into cooperative relation with the forming' means and the other into delivering position opposite one of the leer sections. . 5. In apparatus for the manufacture of sheet glass. an annealing 'leer includingupper and lower annealing sections, sheet forming means, upper and lower conveying tables positioned between the leer and sheet forming means. and means for adjusting the conveyingiabiles vertically so that each table will be brought first-into cooperative relation with respect to the form-ing means and then opposite one ofthe leer sections. 6. In apparatus for the manufacture of sheet glass, an annealing leer including upper and lower annealing sections, sheet formingineans, upper and lower conveying tables positioned between the leer and sheet forming means, and means for moving said tables vertically as a unit in such a, manner that when the lower conveying table is in cooperative relation with the sheet forming means, the upper conveying table will be in delivering position opposite the upper leer section, and that when the upper table is in cooperative relation with the sheet forming means, the lower table will be in delivering position opposite the lower leer section. 7. In apparatus for the manufacture of sheet glass, an annealing leer including 0, plurality of superimposed annealinnf sections, a conveyor arranged in each of said sections, means for driving each of said conveyors at a relatively lo\v rate of speed, sheet forming means, a plurality of superimposed conveying tables positioned between said leer and forming means, means for driving said sheet forming means at n relatively high rate of speed, means for driving said su erimposed conveying, tables at a relativelyiiligh rate of speed, and means for adjusting said conveying tables vertically as a. unit to bring one of said tables into cooperative relation with the forming means and the other into delivering position opposite one of the leer sections. 8. In apparatus for the manufacture of sheet glass, an annealing leer including a plurality of superimposed annealing sections, a. conveyor arranged in each of said sections, means for driving each of said conveyors at a relatively loiv rate of speed, sheet forming means, a plurality of superimposed conveying tables positioned between said leer and forming means, means for driving said sheet forming means at a relatively high rate of speed, means for driving said superimposed conveying tables at a. relatively high rate of speed, and means for adjusting said conveying tables vertically as a unit to bring one of said tables into cooperative relation with the forming means and the other into delivering position opposite one of the leer' sections, at least a portion of the conveyor means in the anneali.;: leers being provided with clutch means which will permit the said conveyor means to be moved by the sheet at a rate of speed greater than the normal driven rate of speed thereof. 9. The process of producing sheet glass, consisting in reducing a mass of **molten** glass to \_ a sheet of substantially predetermined thickness at a relatively high rate of speed, passing the sheet as it is formed upon one of u. pair of supporting surfaces traveling at substantially the same speed, moving said supporting surface vertically from its sheet receiving to a sheet delivering' position, passing; the sheet from said surface into an annealing leer, simultaneously forming fi second 1,\$48,1l8 sheet and passing the same onto the second supporting surface, and in conveying the first mentioned sheet through said leer at a slower rate of\_ speed than the speed at which it was formed. Signed at Toledo, in the county of Lucas sings State of Ohio, this 15th day of June, Janis C.

Classifications:

**International (IPC 8-9):** C03B13/04 (Advanced/Invention); C03B13/00 (Core/Invention)  
**International (IPC 1-7):** C03B13/04  
**CPC:** C03B13/04  
**European:** C03B13/04  
**US:** 65/254 65/96



Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US1848153 A        | 19320308         | US19280287361      | 19280622         |

Priority:

US19280287361 19280622

**Probable Assignee:** LIBBEY OWENS FORD GLASS CO  
**Assignee(s):** (std): LIBBEY OWENS FORD GLASS CO

**Assignee(s):**

LIBBEY OWENS FORD GLASS COMPANY

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

BLAIR JAMES C

**Legal status (INPADOC)**

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| Patent      | Date recorded | Event group | Code | Event                                | Details |
|-------------|---------------|-------------|------|--------------------------------------|---------|
| US1848153 A | 19320308      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |

**Title:** FOIL-DECORATING SHEET AND METHOD OF PRODUCING A FOIL-DECORATED RESIN ARTICLE USING THE SAME

**Abstract:** A foil-decorating sheet (4) comprised by a laminated film of two or more kinds of films which is to be set in an injection mold (5, 6) for being integrally bonded to a surface of a molding resin (10), wherein after a foil-decorating is made, a bonding surface-side film (3) of the laminated film which is bonded to the molding resin (10) has a peel strength of not less than 1 kgf/inch width at least at an interface between the surface film (3) of the laminated film bonded to the molding resin (10) and the molding resin (10), and wherein at least a transparent acrylic film (1) is laminated on the bonding surface-side film (3) bonded to the molding resin, with a decorative layer (2) formed between the bonding surface-side film (3) bonded to the molding resin and the acrylic film (1).

**Classifications:**

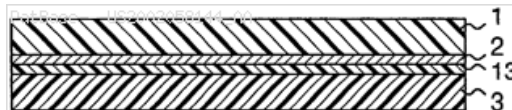
**International (IPC 8-9):** B29C45/14 B29C45/16 B32B27/00 B32B27/08 B32B27/30 B32B27/32 B32B33/00 (Advanced/Invention); B29K105/20 B29L31/58 B29L9/00 (Advanced/Non-invention); B29C45/14 B29C45/16 B32B27/00 B32B27/08 B32B27/30 B32B27/32 B32B33/00 (Core/Invention)

**International (IPC 1-7):** B29C45/14 B29C45/16 B29K105/20 B29K55/02 B29L31/58 B29L9/00 B32B27/00 B32B27/08 B32B27/30 B32B27/32 B32B33/00

**CPC:** Y10T428/31855 Y10T428/31909 Y10T428/31913 Y10T428/31924 Y10T428/31928 Y10T428/31935 Y10T428/31507 Y10T428/31797 B29K2633/08 B29K2715/006 B29K2995/002 B29K2995/0026 B32B1/00 B32B27/308 B32B27/32 B32B2307/412 B32B2323/10 B32B2355/02 B32B2451/00 B32B2605/003 B32B27/08 B29C45/14811

**European:** B29C45/14Q4 B32B27/08 L29K633/08 L29K715/00E L29K995/00E2 L29K995/00E6

**US:** 264/259 264/259S 428/412 428/412P 428/483 428/483S 428/500 428/515 428/516 428/516S 428/519 428/52 428/520 428/520S 428/522 428/542.2



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE69840227 D1      | 20090102         | DE19986040227      | 19980721         |
| EP0933183 A1       | 19990804         | EP19980932589      | 19980721         |
| EP0933183 A4       | 20020807         | EP19980932589      | 19980721         |
| EP0933183 B1       | 20081119         | EP19980932589      | 19980721         |
| JP11091041 A2      | 19990406         | JP19980205995      | 19980722         |
| JP11320608 A2      | 19991124         | JP19980221242      | 19980805         |
| JP2965973 B1       | 19991018         | JP19980221242      | 19980805         |
| JP3598220 B2       | 20041208         | JP19980205995      | 19980722         |
| US2002058144 AA    | 20020516         | US20010974915      | 20011012         |
| US6326086 BA       | 20011204         | US19990147890      | 19990319         |
| US6866938 BB       | 20050315         | US20010974915      | 20011012         |
| WO9904946 A1       | 19990204         | WO1998JP03245      | 19980721         |

**Priority:**

JP19970212598 19970722 JP19980082739 19980313 WO1998JP03245 19980721  
 JP19980205995 19980722 JP19980221242 19980805 US19990147890 19990319  
 US20010974915 20011012

**Probable Assignee:** NISSHA PRINTING CO LTD

**Assignee(s):** (std): MORI FUJIO ; NISSHA PRINTING ; SHIBATA TAKUJI ; YAMANAKA TSUNEYUKI

**Assignee(s):** NISSHA PRINTING CO ; NISSHA PRINTING CO LTD

**Inventor(s):** (std): YAMANAKA TSUNEYUKI ; SHIBATA TAKUJI ; MORI FUJIO

**Agent(s):** HOFFMANN EITL

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

**Legal status (INPADOC)**

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| Patent        | Date recorded | Event group | Code  | Event                                               | Details                                                |
|---------------|---------------|-------------|-------|-----------------------------------------------------|--------------------------------------------------------|
| DE69840227 D1 | 20091105      | LSOP        | -8363 | OPPOSITION AGAINST THE PATENT                       |                                                        |
| EP0933183 A1  | 19990804      | LSPB        | +     | published / reissued                                |                                                        |
| EP0933183 A1  | 19990804      | LSSES       | +17P  | REQUEST FOR EXAMINATION FILED                       | EFFECTIVE DATE : 19990319                              |
| EP0933183 A1  | 20020807      | LSSES       | +A4   | SUPPLEMENTARY SEARCH REPORT DRAWN UP AND DESPATCHED | EFFECTIVE DATE : 20020626                              |
| EP0933183 A1  | 20030226      | LSSES       | +17Q  | FIRST EXAMINATION REPORT DESPATCHED                 | EFFECTIVE DATE : 20030114                              |
| EP0933183 A1  | 20080730      | LSAS        | RAP1  | RIGHTS OF AN APPLICATION TRANSFERRED                | PARTYTYPE : OWNER<br>OWNER : NISSHA PRINTING CO., LTD. |
| EP0933183 A1  | 20081119      | LSGT        | REG   | REFERENCE TO A NATIONAL CODE                        | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D   |
| EP0933183 A1  | 20090923      | LSOP        | -26   | OPPOSITION FILED                                    | PARTYTYPE : OPPONENT<br>OPPONENT : LEONHARD KURZ       |

|               |          |      |       |                                                                                                 |                                                                                                                          |
|---------------|----------|------|-------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|               |          |      |       |                                                                                                 | STIFTUNG & CO. KG<br>EFFECTIVE DATE : 20090817                                                                           |
| EP0933183 A1  | 20120831 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20120618<br>YEAR OF FEE PAYMENT : 15                                      |
| EP0933183 A1  | 20121231 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20120725<br>YEAR OF FEE PAYMENT : 15                                      |
| EP0933183 A1  | 20140425 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST<br>EFFECTIVE DATE : 20140331                                          |
| EP0933183 A1  | 20140530 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : IT<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20130721 |
| EP0933183 A1  | 20140530 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : FR<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20130731 |
| EP0933183 A1  | 20161031 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20160722<br>YEAR OF FEE PAYMENT : 19                                      |
| EP0933183 A1  | 20161031 | LSFE | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                      | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20160721<br>YEAR OF FEE PAYMENT : 19                                      |
| EP0933183 A1  | 20170601 | LSRV | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R064<br>REF DOCUMENT NUMBER : 69840227<br>COUNTRY OF REF DOCUMENT : DE   |
| EP0933183 A1  | 20170601 | LSRV | REG   | REFERENCE TO A NATIONAL CODE                                                                    | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R103<br>REF DOCUMENT NUMBER : 69840227<br>COUNTRY OF REF DOCUMENT : DE   |
| EP0933183 A1  | 20170726 | LSRV | -27W  | PATENT REVOKED                                                                                  | EFFECTIVE DATE : 20170601                                                                                                |
| EP0933183 A1  | 20170726 | LSRV | -GBPR | GB: PATENT REVOKED UNDER ART. 102 OF THE EP CONVENTION DESIGNATING THE UK AS CONTRACTING STATE  | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20170601                                                                       |
| EP0933183 B1  | 20081119 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                            |                                                                                                                          |
| EP0933183 B1  | 20180721 | PEXP |       | Calculated Patent Term Expiry                                                                   |                                                                                                                          |
| JP11091041 A2 | 19990406 | LSPB | +     | published / reissued                                                                            |                                                                                                                          |
| JP11091041 A2 | 20000223 | LSRV | -A02  | DECISION OF REFUSAL                                                                             | TEXT : JAPANESE INTERMEDIATE CODE: A02<br>EFFECTIVE DATE : 20000222                                                      |
| JP11091041 A2 | 20040803 | LSRE | A521  | WRITTEN AMENDMENT                                                                               | TEXT : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20040802                                                     |
| JP11091041 A2 | 20040916 | LSFE | +A61  | FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)                                           | TEXT : JAPANESE INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20040913                                                      |
| JP11091041 A2 | 20040917 | LSGT | +R150 | CERTIFICATE OF                                                                                  | TEXT : JAPANESE INTERMEDIATE                                                                                             |

|               |          |      |       |                                                                          |                                            |
|---------------|----------|------|-------|--------------------------------------------------------------------------|--------------------------------------------|
|               |          |      |       | PATENT OR<br>REGISTRATION<br>OF UTILITY<br>MODEL                         | CODE: R150                                 |
| JP11320608 A2 | 19991124 | LSPB | +     | published /<br>reissued                                                  |                                            |
| JP11320608 A2 | 20040727 | LSFE | +R250 | RECEIPT OF<br>ANNUAL FEES                                                | TEXT : JAPANESE INTERMEDIATE<br>CODE: R250 |
| JP11320608 A2 | 20050726 | LSFE | +R250 | RECEIPT OF<br>ANNUAL FEES                                                | TEXT : JAPANESE INTERMEDIATE<br>CODE: R250 |
| JP11320608 A2 | 20060801 | LSFE | +R250 | RECEIPT OF<br>ANNUAL FEES                                                | TEXT : JAPANESE INTERMEDIATE<br>CODE: R250 |
| JP11320608 A2 | 20070802 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE) | YEAR OF FEE PAYMENT : 8                    |
| JP11320608 A2 | 20070904 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE) | YEAR OF FEE PAYMENT : 9                    |
| JP11320608 A2 | 20080619 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE) | YEAR OF FEE PAYMENT : 9                    |
| JP11320608 A2 | 20080624 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE) | YEAR OF FEE PAYMENT : 10                   |
| JP11320608 A2 | 20090811 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE) | YEAR OF FEE PAYMENT : 11                   |
| JP11320608 A2 | 20100805 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE) | YEAR OF FEE PAYMENT : 11                   |
| JP11320608 A2 | 20100810 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE) | YEAR OF FEE PAYMENT : 12                   |
| JP11320608 A2 | 20100825 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE) | YEAR OF FEE PAYMENT : 12                   |
| JP11320608 A2 | 20110609 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE) | YEAR OF FEE PAYMENT : 12                   |
| JP11320608 A2 | 20110719 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE) | YEAR OF FEE PAYMENT : 13                   |
| JP11320608 A2 | 20120614 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE) | YEAR OF FEE PAYMENT : 13                   |
| JP11320608 A2 | 20120717 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE) | YEAR OF FEE PAYMENT : 14                   |
| JP11320608 A2 | 20130716 | LSFE | +R250 | RECEIPT OF<br>ANNUAL FEES                                                | TEXT : JAPANESE INTERMEDIATE<br>CODE: R250 |
| JP11320608 A2 | 20140715 | LSFE | +R250 | RECEIPT OF<br>ANNUAL FEES                                                | TEXT : JAPANESE INTERMEDIATE<br>CODE: R250 |
| JP11320608 A2 | 20150714 | LSFE | +R250 | RECEIPT OF<br>ANNUAL FEES                                                | TEXT : JAPANESE INTERMEDIATE<br>CODE: R250 |
| JP11320608 A2 | 20160719 | LSFE | +R250 | RECEIPT OF<br>ANNUAL FEES                                                | TEXT : JAPANESE INTERMEDIATE<br>CODE: R250 |

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| JP11320608 A2 | 20170718 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                                                        | TEXT : JAPANESE INTERMEDIATE CODE: R250                             |
| JP11320608 A2 | 20171024 | LSAS | S533  | WRITTEN REQUEST FOR REGISTRATION OF CHANGE OF NAME                            | TEXT : JAPANESE INTERMEDIATE CODE: R313533                          |
| JP11320608 A2 | 20171101 | LSAS | R350  | WRITTEN NOTIFICATION OF REGISTRATION OF TRANSFER                              | TEXT : JAPANESE INTERMEDIATE CODE: R350                             |
| JP11320608 A2 | 20180805 | LSLE | -EXPY | CANCELLATION BECAUSE OF COMPLETION OF TERM                                    |                                                                     |
| JP2965973 B1  | 19991018 | LSGT | +     | granted / extensions (spc, cpc, pte)                                          |                                                                     |
| JP2965973 B1  | 19990728 | LSGT | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | TEXT : JAPANESE INTERMEDIATE CODE: A01<br>EFFECTIVE DATE : 19990727 |
| JP2965973 B1  | 19990729 | LSGT | +A01  | 特許査定書 (Decision of patent grant)                                              |                                                                     |
| JP2965973 B1  | 19990810 | LSFE | R100  | 特許料納付書 (Patent fee payment form)                                              |                                                                     |
| JP2965973 B1  | 19990813 | LSGT | +R150 | 特許証 (Patent certificate)                                                      |                                                                     |
| JP2965973 B1  | 20020627 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                              |                                                                     |
| JP2965973 B1  | 20020702 | LSFE | +R250 | 年金領収書, 年金領収書 (分納) (Pension receipt, annuity receipt (scheduled))              |                                                                     |
| JP2965973 B1  | 20030717 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                              |                                                                     |
| JP2965973 B1  | 20030722 | LSFE | +R250 | 年金領収書, 年金領収書 (分納) (Pension receipt, annuity receipt (scheduled))              |                                                                     |
| JP2965973 B1  | 20040722 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                              |                                                                     |
| JP2965973 B1  | 20050721 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                              |                                                                     |
| JP2965973 B1  | 20060727 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                              |                                                                     |
| JP2965973 B1  | 20090806 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                              |                                                                     |
| JP2965973 B1  | 20100825 | LSFE | R2521 | 自動納付登録通知書 (Automatic payment registration notice)                             |                                                                     |
| JP2965973 B1  | 20110607 | LSFE | R2522 | 自動納付事前通知書 (Automatic advance notice)                                          |                                                                     |
| JP2965973 B1  | 20120605 | LSFE | R2522 | 自動納付事前通知書 (Automatic advance notice)                                          |                                                                     |
| JP2965973 B1  | 20130611 | LSFE | R2522 | 自動納付事前通知書 (Automatic advance notice)                                          |                                                                     |
| JP2965973 B1  | 20130613 | LSFE | R2001 | 特許料納付書 (自動納付) (Patent fee payment form (automatic payment))                   |                                                                     |
| JP2965973 B1  | 20140610 | LSFE | R2522 | 自動納付事前通知書 (Automatic advance notice)                                          |                                                                     |
| JP2965973 B1  | 20140612 | LSFE | R2001 | 特許料納付書 (自動納                                                                   |                                                                     |

|              |          |      |         |                                                                  |                         |
|--------------|----------|------|---------|------------------------------------------------------------------|-------------------------|
|              |          |      |         | 付) (Patent fee payment form (automatic payment))                 |                         |
| JP2965973 B1 | 20150609 | LSFE | R2522   | 自動納付事前通知書 (Automatic advance notice)                             |                         |
| JP2965973 B1 | 20150611 | LSFE | R2001   | 特許料納付書 (自動納付) (Patent fee payment form (automatic payment))      |                         |
| JP2965973 B1 | 20160607 | LSFE | R2522   | 自動納付事前通知書 (Automatic advance notice)                             |                         |
| JP2965973 B1 | 20160609 | LSFE | R2001   | 特許料納付書 (自動納付) (Patent fee payment form (automatic payment))      |                         |
| JP2965973 B1 | 20170606 | LSFE | R2522   | 自動納付事前通知書 (Automatic advance notice)                             |                         |
| JP2965973 B1 | 20170608 | LSFE | R2001   | 特許料納付書 (自動納付) (Patent fee payment form (automatic payment))      |                         |
| JP2965973 B1 | 20170718 | LSFE | +R250   | 年金領収書, 年金領収書 (分納) (Pension receipt, annuity receipt (scheduled)) |                         |
| JP2965973 B1 | 20171024 | LSAS | R313533 | 表示変更登録申請書 (住所) (Display change registration application (name))  |                         |
| JP2965973 B1 | 20171101 | LSAS | R350    | 移転登録済通知書 (Transfer registered notice)                            |                         |
| JP2965973 B1 | 20180805 | PEXP |         | Calculated Patent Term Expiry                                    |                         |
| JP3598220 B2 | 20041208 | LSGT | +       | granted / extensions (spc, cpc, pte)                             |                         |
| JP3598220 B2 | 20040909 | LSGT | +A01    | 特許査定書 (Decision of patent grant)                                 |                         |
| JP3598220 B2 | 20040914 | LSFE | R100    | 特許料納付書 (Patent fee payment form)                                 |                         |
| JP3598220 B2 | 20070906 | LSFE | +FPAY   | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)     | YEAR OF FEE PAYMENT : 3 |
| JP3598220 B2 | 20070911 | LSFE | +FPAY   | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)     | YEAR OF FEE PAYMENT : 4 |
| JP3598220 B2 | 20080717 | LSFE | +FPAY   | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)     | YEAR OF FEE PAYMENT : 4 |
| JP3598220 B2 | 20080722 | LSFE | +FPAY   | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)     | YEAR OF FEE PAYMENT : 5 |
| JP3598220 B2 | 20090827 | LSFE | +FPAY   | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)     | YEAR OF FEE PAYMENT : 5 |
| JP3598220 B2 | 20090901 | LSFE | +FPAY   | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)     | YEAR OF FEE PAYMENT : 6 |
| JP3598220 B2 | 20100902 | LSFE | +FPAY   | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF               | YEAR OF FEE PAYMENT : 6 |

|              |          |      |       |                                                                                       |                                            |
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| JP3598220 B2 | 20100907 | LSFE | +FPAY | DATABASE)<br>RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE) | YEAR OF FEE PAYMENT : 7                    |
| JP3598220 B2 | 20101013 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE)              | YEAR OF FEE PAYMENT : 7                    |
| JP3598220 B2 | 20101013 | LSFE | R2521 | 自動納付登録通知書<br>(Automatic<br>payment<br>registration<br>notice)                         |                                            |
| JP3598220 B2 | 20110712 | LSFE | R2522 | 自動納付事前通知書<br>(Automatic<br>advance notice)                                            |                                            |
| JP3598220 B2 | 20110714 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE)              | YEAR OF FEE PAYMENT : 7                    |
| JP3598220 B2 | 20110823 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE)              | YEAR OF FEE PAYMENT : 8                    |
| JP3598220 B2 | 20120710 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE)              | YEAR OF FEE PAYMENT : 8                    |
| JP3598220 B2 | 20120710 | LSFE | R2522 | 自動納付事前通知書<br>(Automatic<br>advance notice)                                            |                                            |
| JP3598220 B2 | 20120719 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE)              | YEAR OF FEE PAYMENT : 8                    |
| JP3598220 B2 | 20120821 | LSFE | +FPAY | RENEWAL FEE<br>PAYMENT (EVENT<br>DATE IS RENEWAL<br>DATE OF<br>DATABASE)              | YEAR OF FEE PAYMENT : 9                    |
| JP3598220 B2 | 20130716 | LSFE | R2522 | 自動納付事前通知書<br>(Automatic<br>advance notice)                                            |                                            |
| JP3598220 B2 | 20130718 | LSFE | R2001 | 特許料納付書 (自動納<br>付) (Patent fee<br>payment form<br>(automatic<br>payment))              |                                            |
| JP3598220 B2 | 20130820 | LSFE | +R250 | RECEIPT OF<br>ANNUAL FEES                                                             | TEXT : JAPANESE INTERMEDIATE<br>CODE: R250 |
| JP3598220 B2 | 20140715 | LSFE | R2522 | 自動納付事前通知書<br>(Automatic<br>advance notice)                                            |                                            |
| JP3598220 B2 | 20140717 | LSFE | R2001 | 特許料納付書 (自動納<br>付) (Patent fee<br>payment form<br>(automatic<br>payment))              |                                            |
| JP3598220 B2 | 20140819 | LSFE | +R250 | RECEIPT OF<br>ANNUAL FEES                                                             | TEXT : JAPANESE INTERMEDIATE<br>CODE: R250 |
| JP3598220 B2 | 20150714 | LSFE | R2522 | 自動納付事前通知書<br>(Automatic<br>advance notice)                                            |                                            |
| JP3598220 B2 | 20150716 | LSFE | R2001 | 特許料納付書 (自動納<br>付) (Patent fee<br>payment form<br>(automatic<br>payment))              |                                            |
| JP3598220 B2 | 20150818 | LSFE | +R250 | RECEIPT OF<br>ANNUAL FEES                                                             | TEXT : JAPANESE INTERMEDIATE<br>CODE: R250 |
| JP3598220 B2 | 20160712 | LSFE | R2522 | 自動納付事前通知書<br>(Automatic<br>advance notice)                                            |                                            |
| JP3598220 B2 | 20160714 | LSFE | R2001 | 特許料納付書 (自動納<br>付) (Patent fee<br>payment form<br>(automatic<br>payment))              |                                            |

|                 |          |      |       |                                                             |                                                                                                                                                                                                                                                        |
|-----------------|----------|------|-------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP3598220 B2    | 20160823 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                                      | TEXT : JAPANESE INTERMEDIATE CODE: R250                                                                                                                                                                                                                |
| JP3598220 B2    | 20170711 | LSFE | R2522 | 自動納付事前通知書 (Automatic advance notice)                        |                                                                                                                                                                                                                                                        |
| JP3598220 B2    | 20170713 | LSFE | R2001 | 特許料納付書 (自動納付) (Patent fee payment form (automatic payment)) |                                                                                                                                                                                                                                                        |
| JP3598220 B2    | 20170822 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                                      | TEXT : JAPANESE INTERMEDIATE CODE: R250                                                                                                                                                                                                                |
| JP3598220 B2    | 20171024 | LSAS | S533  | WRITTEN REQUEST FOR REGISTRATION OF CHANGE OF NAME          | TEXT : JAPANESE INTERMEDIATE CODE: R313533                                                                                                                                                                                                             |
| JP3598220 B2    | 20171101 | LSAS | R350  | WRITTEN NOTIFICATION OF REGISTRATION OF TRANSFER            | TEXT : JAPANESE INTERMEDIATE CODE: R350                                                                                                                                                                                                                |
| JP3598220 B2    | 20180722 | LSLE | -EXPY | CANCELLATION BECAUSE OF COMPLETION OF TERM                  |                                                                                                                                                                                                                                                        |
| JP3598220 B2    | 20180722 | PEXP |       | Calculated Patent Term Expiry                               |                                                                                                                                                                                                                                                        |
| US2002058144 AA | 20020516 | LSPB | +     | published / reissued                                        |                                                                                                                                                                                                                                                        |
| US2002058144 AA | 20050223 | LSGT | PAT1  | Patented Case                                               |                                                                                                                                                                                                                                                        |
| US2002058144 AA | 20050223 | LSGT | STCF  | INFORMATION ON STATUS: PATENT GRANT                         | TEXT : PATENTED CASE                                                                                                                                                                                                                                   |
| US6326086 BA    | 20011204 | LSGT | +     | granted / extensions (spc, cpc, pte)                        |                                                                                                                                                                                                                                                        |
| US6326086 BA    | 19990319 | LSAS | AS    | ASSIGNMENT                                                  | PARTYTYPE : OWNER<br>OWNER : NISSHA PRINTING CO., LTD., JAPAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:MORI, FUJIO;<br>SHIBATA, TAKUJI; YAMANAKA, TSUNEYUKI;<br>REEL/FRAME:010136/0642;<br>SIGNING DATES FROM 19990208 TO 19990212 |
| US6326086 BA    | 20011116 | LSGT | PAT1  | Patented Case                                               |                                                                                                                                                                                                                                                        |
| US6326086 BA    | 20011116 | LSGT | STCF  | INFORMATION ON STATUS: PATENT GRANT                         | TEXT : PATENTED CASE                                                                                                                                                                                                                                   |
| US6326086 BA    | 20050526 | LSFE | +FPAY | FEE PAYMENT                                                 | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                |
| US6326086 BA    | 20090529 | LSFE | +FPAY | FEE PAYMENT                                                 | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                |
| US6326086 BA    | 20130531 | LSFE | +FPAY | FEE PAYMENT                                                 | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                                               |
| US6326086 BA    | 20190319 | PEXP |       | Calculated Patent Term Expiry                               |                                                                                                                                                                                                                                                        |
| US6866938 BB    | 20050315 | LSGT | +     | granted / extensions (spc, cpc, pte)                        |                                                                                                                                                                                                                                                        |
| US6866938 BB    | 20011130 | LSAS | AS    | ASSIGNMENT                                                  | PARTYTYPE : OWNER<br>OWNER : NISSHA PRINTING CO., LTD., JAPAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:MORI, FUJIO;<br>SHIBATA, TAKUJI; YAMANAKA, TSUNEYUKI;<br>REEL/FRAME:012330/0693<br>EFFECTIVE DATE : 20011113                |
| US6866938 BB    | 20080808 | LSFE | +FPAY | FEE PAYMENT                                                 | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                |
| US6866938 BB    | 20120725 | LSFE | +FPAY | FEE PAYMENT                                                 | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                |
| US6866938 BB    | 20160905 | LSFE | +FPAY | FEE PAYMENT                                                 | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                                               |

|              |          |      |      |                                                            |                                                                        |
|--------------|----------|------|------|------------------------------------------------------------|------------------------------------------------------------------------|
| US6866938 BB | 20211012 | PEXP |      | Calculated Patent<br>Term Expiry                           |                                                                        |
| WO9904946 A1 | 19990204 | LSPB | +    | published /<br>reissued                                    |                                                                        |
| WO9904946 A1 | 19990319 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE       | REF DOCUMENT NUMBER :<br>09147890<br>COUNTRY OF REF DOCUMENT :<br>US   |
| WO9904946 A1 | 19990319 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE       | REF DOCUMENT NUMBER :<br>1998932589<br>COUNTRY OF REF DOCUMENT :<br>EP |
| WO9904946 A1 | 19990804 | LSPB | +WWP | WIPO<br>INFORMATION:<br>PUBLISHED IN<br>NATIONAL<br>OFFICE | REF DOCUMENT NUMBER :<br>1998932589<br>COUNTRY OF REF DOCUMENT :<br>EP |

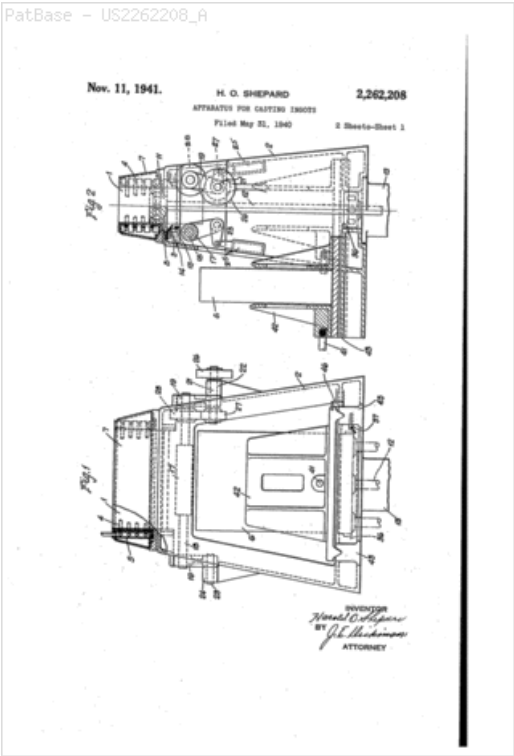
**Title:** APPARATUS FOR CASTING INGOTS

**Abstract:** I claim: \_ 1. Apparatus for casting tall ingots, comprising a bottomless mold of materially less height than the ingots to be cast therein, a vertically movable pedestal serving as a temporary bottom for the mold, means for lowering the pedestal as an ingot is formed thereon by the solidifying of metal poured into the mold, means below the mold for supporting the growing ingot and controlling its downward rate of travel, control means for causing the pedestal-lowering means to move downwardly away from the ingot after it has been received by said supporting means, means adapted to be disposed between the lowered pedestal and the ingot for receiving the completed ingot in upright position and for carrying it away from beneath the mold, and control means for causing the pedestal lowering means to rise back up to the mold so that a new ingot can be cast. 2. Apparatus for casting tall ingots, comprising a bottomless mold of materially less height than the ingots to be cast therein, a vertically movable pedestal serving as a temporary bottom for the mold, means for lowering the pedestal as an ingot is formed thereon by the solidifying of metal poured into the mold, means below the mold for supporting the growing ingot and controlling its downward rate of travel, control means for causing the pedestal-lowering means to move downwardly away from the ingot after it has been received by said supporting means, a carriage spaced laterally from the pedestal, means for moving the carriage in between the lowered pedestal and the ingot for receiving the completed ingot and carrying it away from beneath the mold. and control means for causing the pedestal lowering means to rise back up to the mold so that a new ingot can be cast. , 3. Apparatus for casting tall ingots, comprising a bottomless mold of materially less height than the ingots to be cast therein, a vertically movable pedestal serving as a temporary bottom for the mold, means for lowering the pedestal as an ingot is formed thereon by the solidifying of metal poured into the mold, rolls journaled below the mold for frictionally engaging opposite sides of the growing ingot, means for driving the rolls to control the downward rate of travel of the ingot, control means for causing the pedestal-lowering means to move downwardly away from the ingot after it has been engaged by the rolls, means adapted to be disposed between the lowered pedestal and the ingot for receiving the completed ingot in upright position and for carrying it away from beneath the mold, and control means for causing the pedestal lowering means to rise back up to the mold so that a new ingot can be cast. 4. Apparatus for casting tall ingots, comprising a bottomless mold of materially less height than the ingots to be cast therein, a frame supporting the mold and provided in its floor with a recess directly below the mold, a vertically movable pedestal serving as a temporary bottom for the mold, means below the frame and extending up through it for lowering the pedestal as an ingot is formed thereon by the solidifying of metal poured into the mold, means below the mold for supporting the growing ingot and controlling its downward rate of travel, control means for causing the pedestal-lowering means to move downwardly away from the ingot and into said floor recess after the ingot has been received by said supporting means, a carriage spaced laterally from said recess, means for moving the carriage inwardly on said floor and over said recess between the pedestal therein and the ingot for receiving the completed ingot and carrying it away from beneath the mold. and control means for causing the pedestal-lowering means to rise back up to the mold so that a new ingot can be cast. 5. Apparatus for casting tall ingots, comprising a bottomless mold of materially less height than the ingots to be cast therein, a vertically movable pedestal serving as a temporary bottom for the mold, means for lowering the pedestal as an ingot is formed thereon by the solidifying of metal poured into the mold, means below the mold for supporting the growing ingot and controlling its downward rate of travel, control means automatically actuated when the ingot engages said supporting means for causing the pedestal-lowering means to move downwardly away from the ingot after it has been received by said supporting means, means adapted to be disposed between the lowered pedestal and the ingot; for receiving the completed ingot in upright position and for carrying it away from beneath the mold, and control means for causing the pedestal-lowering means to rise back up to the mold so that a new ingot can be cast. 6. Apparatus for casting tall ingots, comprising a bottomless mold of materially less height than the ingots to be cast therein, a vertically movable pedestal serving as a temporary bottom for the mold, means for lowering the pedestal as an ingot is formed thereon by the solidifying of metal poured into the mold, means below the mold for supporting the growing ingot and controlling its downward rate of travel, control means for causing the pedestal-lowering means to move downwardly away from the ingot after it has been received by said supporting means, a carriage spaced laterally from the pedestal, means actuated by the pedestal when it reaches its lower limit of travel for moving the carriage in between the lowered pedestal and the ingots for receiving the completed ingot and carrying it away from beneath the mold. and control means for causing the pedestal-lowering means to rise back up to the mold so that a new ingot can be cast. , 7. Apparatus for casting tall ingots, comprising a bottomless mold of materially less height than the ingots to be cast therein, a vertically movable pedestal serving as a temporary bottom for the mold, means for lowering the pedestal as an ingot is formed thereon by the solidifying of metal poured into the mold, means below the mold for supporting the growing ingot and controlling its downward rate of travel, control means for causing the pedestal-lowering means to move downwardly away from the ingot after it has been received by said supporting means, a carriage spaced laterally from the pedestal, means for moving the carriage in between the lowered pedestal and the ingot for receiving the completed ingot and carrying it away from beneath the mold, and control means actuated by the carriage as it moves away from the pedestal for causing the pedestal lowering means to rise back up to the mold so that a new ingot can be cast. ' B. Apparatus for casting tall ingots, comprising a bottomless mold of materially less height than the ingots to be cast therein, a vertically movable pedestal serving as a temporary bottom for the mold, means for lowering the pedestal as an ingot is formed thereon by the solidifying of metal poured into the mold, rolls journaled below the mold for frictionally engaging opposite sides of the growing ingot, electrically operated means for driving the rolls to control the downward rate of travel of the ingot, an electric circuit for controlling said electrically operated means connected to said rolls and closed by the ingot engaging the rolls, control means for causing the pedestal-lowering means to move downwardly away from the ingot after it has been engaged by the rolls, means adapted to be disposed between the lowered pedestal and the ingot for receiving the completed ingot in upright position and for carrying it away from beneath the mold, and control means for causing the pedestal lowering means to rise back up to the mold so that a new ingot can be cast. 9. Apparatus for casting tall ingots, comprising a bottomless mold of materially less height than the ingots to be cast therein, means for spraying a cooling fluid on the side walls of the mold, a vertically movable pedestal serving as a temporary bottom for the mold, means for lowering the pedestal as an ingot is formed thereon by the solidifying of metal poured into the mold, means below the mold for supporting the growing ingot and controlling its downward rate of travel, control means for causing the pedestal lowering means to move downwardly away from the ingot after it has been received by said supporting means, means adapted to be disposed between the lowered pedestal and the ingot for receiving the completed ingot in upright position and for carrying it away from beneath the mold, and control means for causing the pedestal lowering means to rise back up to the mold so that a new ingot can be cast. 10. Apparatus for casting tall ingots, comprising a bottomless mold of materially less height than the ingots to be cast therein, means for spraying a cooling fluid on the side walls of the mold, a vertically movable pedestal serving as a temporary bottom for the mold, means for lowering the pedestal as an ingot is formed thereon by the solidifying of metal poured into the mold, means below the mold for supporting the growing ingot and controlling its downward rate of travel, control means for causing the pedestal lowering means to move downwardly away from the ingot after it has been received by said supporting means, means adapted to be disposed between the lowered pedestal and the ingot for receiving the completed ingot in upright position and for carrying it away from beneath the mold, and control means for causing the pedestal lowering means to rise back up to the mold so that a new ingot can be cast. 11. Apparatus for casting tall ingots, comprising a bottomless mold of materially less height than the ingots to be cast therein, a plurality of pipes surrounding the mold and adapted to be connected to a source of cooling fluid under pressure, said pipes being perforated for spraying the fluid onto the side walls of the mold, an shield surrounding the pipes and mold, a vertically movable pedestal serving as a temporary bottom for the mold, means for lowering the pedestal as an ingot is formed thereon by the solidifying of metal poured into the mold, said mold being provided around its bottom between its side walls and shield with openings through which said sprayed fluid drains, means below said openings for catching said fluid and directing it against the sides of the portion of the ingot below the mold, means below the mold for supporting the growing ingot and controlling its downward rate of travel, control means for causing the pedestal-lowering means to move downwardly away from the ingot after it has been received by said supporting means, means adapted to be disposed between the lowered pedestal and the ingot for receiving the completed ingot in upright position and for carrying it away from beneath the mold, and control means for causing the pedestal lowering means to rise back up to the mold so that a new ingot can be cast

**Classifications:**

**International (IPC 8-9):** B22D11/16 B22D9/00 (Advanced/Invention);  
B22D11/16 B22D9/00 (Core/Invention)

International (IPC 1-7): B22D7/00  
CPC: B22D9/00 B22D11/16  
European: B22D11/16 B22D9/00  
US: 164/269 164/425



Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2262208 A        | 19411111         | US19400338010      | 19400531         |

Priority:

US19400338010 19400531

Probable Assignee: UNITED ENG FOUNDRY CO

Assignee(s): (std): UNITED ENG FOUNDRY CO

Assignee(s): UNITED ENGINEERING AND FOUNDRY CO ; UNITED ENGINEERING AND FOUNDRY COMPANY

Inventor(s): (std): OLCOTT SHEPARD HAROLD

Inventor(s): SHEPARD HAROLD OLCOTT

Legal status (INPADOC)

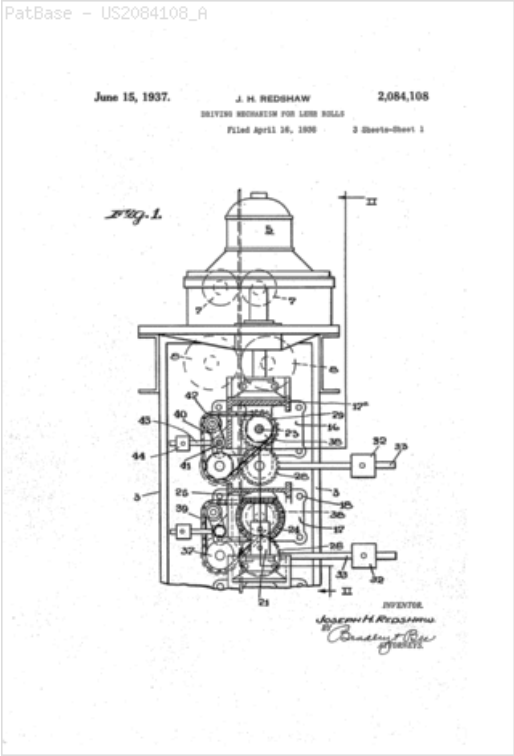
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| Patent      | Date recorded | Event group | Code | Event                                | Details |
|-------------|---------------|-------------|------|--------------------------------------|---------|
| US2262208 A | 19411111      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |

Title: DRIVING MECHANISM FOR LEHR ROLLS

**Abstract:** 1. In combination with an upright lehr frame provided along its length with a series of pairs of rolls with shafts therethrough for drawing a glass sheet upward, one of the rolls of each pair being fixed and the other movable, a motor at the upper end of the frame, a vertical drive shaft extending downwardly from the motor along one side of the frame and provided with a series of bevel gears, a bracket secured to the frame adjacent the ends of each pair of rolls, a countershaft mounted in each bracket transversely of the drive shaft and provided at its outer end with a bevel gear meshing with one of the bevel gears on the drive shaft, said countershafts also each having secured thereon a spur gear and a chain pinion, a hanger mounted on each of the countershafts in which the end of one of the movable **roll shaft** ends is journaled, a hanger in which the other end of each of the movable **roll shafts** is journaled at the other side of the frame, a spur gear carried by each of said first hangers concentric with the **roll shaft** supported by such hanger in driving relation with the **roll shaft** and meshing with the spur gear on the countershaft, a chain pinion secured to the shaft of each fixed roll, and a drive chain extending around each of said last pinions and the chain pinion on its associated countershaft.

**Classifications:**  
**International (IPC 8-9):** C03B15/12 (Advanced/Invention); C03B15/00 (Core/Invention)  
**International (IPC 1-7):** C03B15/12  
**CPC:** C03B15/12 Y10T74/19084  
**European:** C03B15/12  
**US:** 226/187 49/17 65/194 74/665GA



Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2084108 A        | 19370615         | US19360074691      | 19360416         |

Priority:

US19360074691 19360416

**Probable Assignee:** PITTSBURGH PLATE GLASS CO  
**Assignee(s):** (std): PITTSBURGH PLATE GLASS CO  
**Assignee(s):** PITTSBURGH PLATE GLASS COMPANY  
**Inventor(s):** (std): REDSHAW JOSEPH H

Legal status (INPADOC)

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| Patent      | Date recorded | Event group | Code | Event                                | Details |
|-------------|---------------|-------------|------|--------------------------------------|---------|
| US2084108 A | 19370615      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |

**Title:** APPARATUS FOR MAKING BOTTOM SEAL THERMOPLASTIC BAGS

**Abstract:** According to the present disclosure, tubular thermoplastic material is intermittently fed between opposed transversely extending seal bars operating in timed relation with the intermittent feeding of the web to sequentially perform cutting and sealing of the web during its period of repose. While the sealed portion of the web is at the sealing station, cooling air is discharged along the sealed portion of the web to effect cooling.

**Classifications:**

**International (IPC 8-9):** B26F3/06 B29C65/02 B31B19/10

B31B23/00 (Advanced/Invention);

B26F3/06 B29C65/02 B31B19/00 B31B23/00 (Core/Invention)

**International (IPC 1-7):** B26D7/06 B29C B29D B30B15/34 B31B1/16

B31B1/64 B31B21/00 B31B21/14 B31B21/60 B31B23/00 B31B23/02

B31B23/14 B31B23/60 B31B23/74 B32B31/00 F16D67/06

**CPC:** B29C65/305 B29C65/745 B26F3/06 B29C65/18 B29C66/02241

B29C66/1122 B29C66/43 B29C66/81821 B29C66/8226

B29C66/8511 B29L2031/7128 B29C66/0044 B29C66/8122

B29C66/8181 B29C66/81415 B29C66/81425 B29C66/81427

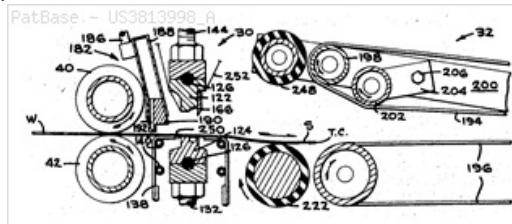
B29C66/81431 B29C66/4312 Y10T156/1052 Y10T156/12 B29C66/8322 Y10T83/283 Y10T83/2196 Y10T83/323 B31B70/00

B31B70/10 B31B2155/00 B31B2155/003 B31B2160/10

**European:** B26F3/06 B29C65/02G B29C65/18 B29C65/745 B29C66/74E B29C66/1122 B29C66/43 B29C66/81821

B29C66/8226 B31B19/10 B31B23/00 L29C66/02241 L29C66/8511 L29L31/7128 L31B219/02A L31B237/10 L31B237/60

**US:** 156/250 156/308.4 156/498 156/510 156/583.1 493/191 493/204 83/156 83/170 83/175 93/3.3H



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| BE789622 A         | 19730201         |                    | 00000000         |
| BE789622 A1        | 19730201         | BE19720122708      | 19721003         |
| CA985544 A1        | 19760316         | CA19750232149      | 19750724         |
| CA985544 A2        | 19760316         | CA19750232149      | 19750724         |
| CA987151 A1        | 19760413         | CA19720153184      | 19721004         |
| DE2245198 A1       | 19730524         | DE19722245198      | 19720914         |
| DE2245198 B2       | 19801204         | DE19722245198      | 19720914         |
| DE2245198 C3       | 19861113         | DE19722245198      | 19720914         |
| DE2265432 B1       | 19801218         | DE19722265432      | 19720914         |
| DE2265534 B2       | 19810521         | DE19722265534      | 19720914         |
| DE7233942 U        | 19870319         | DE19720033942U     | 19720914         |
| ES406376 A1        | 19760116         | ES19720406376      | 19720904         |
| ES435705 A1        | 19761216         | ES19750435705      | 19750317         |
| GB1384570 A        | 19750219         | GB19720051905      | 19721110         |
| IT965399 A         | 19740131         | IT19720052814      | 19720918         |
| US3813998 A        | 19740604         | US19730344691      | 19730326         |
| US3902954 A        | 19750902         | US19730344677      | 19730326         |
| US4101363 A        | 19780718         | US19730344700      | 19730326         |
| US4105489 A        | 19780808         | US19730382607      | 19730725         |

**Priority:**

US19710198282 19711112 CA19720153184 19721004 US19730344691 19730326  
US19730344677 19730326 CA19750232149 19750724

**Probable Assignee:** FMC CORP

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

**Assignee(s):** FMC CORP 1105 COLEMAN AVENUE SAN JOSE CALIFORNIE ; FMC CORP SAN JOSE CALIF V ST A ; FMC CORP CHICAGO ILL V ST A ; FMC CORP US ; FMC CORP SAN JOSE CALIF US ; FMC CORP 1105 COLEMAN AVENUE SAN JOSE CALIFORNIE E U A ; LOTTO RONALD L ; F M C ; F M C CORP

**Inventor(s):** (std): LOTTO R ; LOTTO RONALD LEROY ; LOTTO RONALD L ; LEROY LOTTO RONALD ; LOTTO R L

**Inventor(s):** R L LOTTO ; LOTTO R US ; LOTTO RONALD LEROY BONDUEL WIS VSTA ; RL LOTTO ; LOTTO RONALD LEROY BONDUEL WIS V ST A ; LOTTO RONALD LEROY BONDUEL WIS

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code  | Event                                               | Details                                             |
|--------------|---------------|-------------|-------|-----------------------------------------------------|-----------------------------------------------------|
| BE789622 A   | 19730201      | LSPB        | +     | published / reissued                                |                                                     |
| BE789622 A1  | 19730201      | LSPB        | +     | published / reissued                                |                                                     |
| BE789622 A1  | 19920101      | LSLE        | -RE20 | PATENT EXPIRED                                      | OWNER NAME : FMC CORP.<br>EFFECTIVE DATE : 19921003 |
| CA985544 A2  | 19760316      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |                                                     |
| DE2245198 A1 | 19730524      | LSPB        | +     | published / reissued                                |                                                     |
| DE2245198 B2 | 19801204      | LSPB        | +     | published / reissued                                |                                                     |
| DE2245198 B2 | 19810716      | LSOP        | -8263 | OPPOSITION AGAINST GRANT OF A PATENT                |                                                     |
| DE2245198 C3 | 19861113      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |                                                     |
| DE2245198 C3 | 19861113      | LSGT        | +C3   | GRANT AFTER TWO PUBLICATION STEPS (3RD PUBLICATION) |                                                     |

|              |          |      |       |                                              |
|--------------|----------|------|-------|----------------------------------------------|
| DE2265432 B1 | 19801218 | LSPB | +     | published / reissued                         |
| DE2265432 B1 | 19780810 | LSES | +OD   | REQUEST FOR EXAMINATION                      |
| DE2265432 B1 | 19810716 | LSOP | -8263 | OPPOSITION AGAINST GRANT OF A PATENT         |
| DE2265432 B1 | 19850829 | LSRV | -8235 | PATENT REFUSED                               |
| DE2265534 B2 | 19810521 | LSPB | +     | published / reissued                         |
| DE2265534 B2 | 19800320 | LSES | +OD   | REQUEST FOR EXAMINATION                      |
| DE2265534 B2 | 19811015 | LSOP | -8263 | OPPOSITION AGAINST GRANT OF A PATENT         |
| DE2265534 B2 | 19840920 | LSRV | -8235 | PATENT REFUSED                               |
| DE7233942 U  | 19870319 | LSGT | +     | granted / extensions (spc, cpc, pte)         |
| ES406376 A1  | 19760116 | LSGT | +     | granted / extensions (spc, cpc, pte)         |
| ES435705 A1  | 19761216 | LSGT | +     | granted / extensions (spc, cpc, pte)         |
| GB1384570 A  | 19750219 | LSGT | +     | granted / extensions (spc, cpc, pte)         |
| GB1384570 A  | 19750702 | LSGT | +PS   | PATENT SEALED                                |
| GB1384570 A  | 19921209 | LSLE | -PE20 | PATENT EXPIRED AFTER TERMINATION OF 20 YEARS |
| GB1384570 A  | 19921110 | PEXP |       | Calculated Patent Term Expiry                |
| IT965399 A   | 19740131 | LSGT | +     | granted / extensions (spc, cpc, pte)         |
| IT965399 A   | 19920918 | PEXP |       | Calculated Patent Term Expiry                |
| US3813998 A  | 19740604 | LSGT | +     | granted / extensions (spc, cpc, pte)         |
| US3902954 A  | 19750902 | LSGT | +     | granted / extensions (spc, cpc, pte)         |
| US4101363 A  | 19780718 | LSGT | +     | granted / extensions (spc, cpc, pte)         |
| US4105489 A  | 19780808 | LSGT | +     | granted / extensions (spc, cpc, pte)         |

**Title:** LOW FRICTION EDGE ROLL TO MINIMIZE FORCE CYCLING

**Abstract:** An apparatus for drawing a glass ribbon including a shroud surrounding the glass ribbon and an edge roll that penetrates the shroud to contact the glass ribbon. The apparatus includes regulating a pressure within the seal assembly to be equal to or less than a pressure within the shroud and prevent ingress of relatively cooler outside gas into the hot interior of the shroud. The edge roll utilizes an air bearing to minimize friction that can produce periodic fluctuation of the ribbon as the edge roll is displaced in response to variations in the ribbon thickness or equipment dimensions.

**Classifications:**

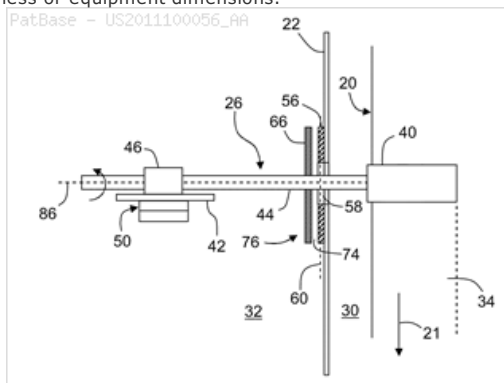
**International (IPC 8-9):** B41J B65G13/00 C03B13/00 C03B15/02 C03B15/04 C03B17/06 C03B18/02 C03B29/06 (Advanced/Invention); B65G13/00 (Advanced/Non-invention);

C03B15/02 (Core/Non-invention)

**CPC:** C03B17/067 C03B17/068

**European:** C03B17/06F C03B17/06G

**US:** 65/181 65/181S 65/199 65/202 65/205 65/90 65/90P 65/91



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN102050562 A      | 20110511         | CN201010535767     | 20101029         |
| CN102050562 B      | 20130717         | CN201010535767     | 20101029         |
| IN02567DE2010 A    | 20131004         | IN2010DE02567      | 20101027         |
| JP2011098884 A2    | 20110519         | JP20100243825      | 20101029         |
| JP5271335 B2       | 20130821         | JP20100243825      | 20101029         |
| KR20110047164 A    | 20110506         | KR20100106857      | 20101029         |
| TW201127759 A      | 20110816         | TW20100136556      | 20101026         |
| TWI406822 B        | 20130901         | TW20100136556      | 20101026         |
| US2011100056 AA    | 20110505         | US20090608036      | 20091029         |
| US8146388 BB       | 20120403         | US20090608036      | 20091029         |

**Priority:**

US20090608036 20091029 KR20100106857 20101029

**Probable Assignee:** CORNING INC

**Assignee(s):** (std): ANDERSON JAMES G ; CORNING CO LTD ; CORNING INC ; KLINGENSMITH L KIRK ; ULRICH DAVID J ; PERIS JAMES P

**Inventor(s):** (std): PERIS JAMES PAUL ; KLINGENSMITH LEWIS KIRK ; ULRICH DAVID JOHN ; ANDERSON JAMES GARY ; KLINGENSMITH L KIRK ; PERIS JAMES P ; ULRICH DAVID J ; ANDERSON JAMES G ; KIRK KLINGENSMITH L

**Inventor(s):** KLINGENSMITH LEWIS ; L KIRK KLINGENSMITH ; JAMES G ANDERSON ; DAVID J ULRICH ; JAMES P PERIS

**Agent(s):** KEVIN M

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                                        | Details |
|-----------------|---------------|-------------|-------|--------------------------------------------------------------|---------|
| CN102050562 A   | 20110511      | LSPB        | +     | published / reissued                                         |         |
| CN102050562 A   | 20110511      | LSPB        | +C06  | PUBLICATION                                                  |         |
| CN102050562 B   | 20130717      | LSGT        | +     | granted / extensions (spc, cpc, pte)                         |         |
| CN102050562 B   | 20130717      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL                             |         |
| CN102050562 B   | 20171215      | LSLE        | -CF01 | TERMINATION OF PATENT RIGHT DUE TO NON-PAYMENT OF ANNUAL FEE |         |
| CN102050562 B   | 20301029      | PEXP        |       | Calculated Patent Term Expiry                                |         |
| IN02567DE2010 A | 20131004      | LSPB        | +     | published / reissued                                         |         |
| JP2011098884 A2 | 20110519      | LSPB        | +     | published / reissued                                         |         |
| JP5271335 B2    | 20130821      | LSGT        | +     | granted / extensions (spc, cpc, pte)                         |         |

|                 |          |       |       |                                                                               |                                                                                                                                                                                                                                                                           |
|-----------------|----------|-------|-------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP5271335 B2    | 20110312 | LSSES | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION                                   | TEXT : JAPANESE INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20110311                                                                                                                                                                                                      |
| JP5271335 B2    | 20111223 | LSRE  | A521  | WRITTEN AMENDMENT                                                             | TEXT : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20111222                                                                                                                                                                                                      |
| JP5271335 B2    | 20121106 | LSSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                           | TEXT : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20121106                                                                                                                                                                                                      |
| JP5271335 B2    | 20130323 | LSRE  | A521  | WRITTEN AMENDMENT                                                             | TEXT : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20130322                                                                                                                                                                                                      |
| JP5271335 B2    | 20130405 | LSGT  | +TRDD | DECISION OF GRANT OR REJECTION WRITTEN                                        |                                                                                                                                                                                                                                                                           |
| JP5271335 B2    | 20130416 | LSGT  | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | TEXT : JAPANESE INTERMEDIATE CODE: A01<br>EFFECTIVE DATE : 20130416                                                                                                                                                                                                       |
| JP5271335 B2    | 20130418 | LSGT  | +A01  | 特許査定書 (Decision of patent grant)                                              |                                                                                                                                                                                                                                                                           |
| JP5271335 B2    | 20130514 | LSFE  | R100  | 特許料納付書 (Patent fee payment form)                                              |                                                                                                                                                                                                                                                                           |
| JP5271335 B2    | 20130516 | LSFE  | +A61  | FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)                         | TEXT : JAPANESE INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20130510                                                                                                                                                                                                       |
| JP5271335 B2    | 20130517 | LSGT  | +R150 | CERTIFICATE OF PATENT OR REGISTRATION OF UTILITY MODEL                        | TEXT : JAPANESE INTERMEDIATE CODE: R150                                                                                                                                                                                                                                   |
| JP5271335 B2    | 20160517 | LSLE  | -LAPS | CANCELLATION BECAUSE OF NO PAYMENT OF ANNUAL FEES                             |                                                                                                                                                                                                                                                                           |
| JP5271335 B2    | 20301029 | PEXP  |       | Calculated Patent Term Expiry                                                 |                                                                                                                                                                                                                                                                           |
| KR20110047164 A | 20110506 | LSPB  | +     | published / reissued                                                          |                                                                                                                                                                                                                                                                           |
| KR20110047164 A | 20151130 | LSDW  | -WITN | WITHDRAWAL DUE TO NO REQUEST FOR EXAMINATION                                  |                                                                                                                                                                                                                                                                           |
| TW201127759 A   | 20110816 | LSPB  | +     | published / reissued                                                          |                                                                                                                                                                                                                                                                           |
| TWI406822 B     | 20130901 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                          |                                                                                                                                                                                                                                                                           |
| TWI406822 B     | 20170601 | LSLE  | -MM4A | ANNULMENT OR LAPSE OF PATENT DUE TO NON-PAYMENT OF FEES                       |                                                                                                                                                                                                                                                                           |
| TWI406822 B     | 20301026 | PEXP  |       | Calculated Patent Term Expiry                                                 |                                                                                                                                                                                                                                                                           |
| US2011100056 AA | 20110505 | LSPB  | +     | published / reissued                                                          |                                                                                                                                                                                                                                                                           |
| US8146388 BB    | 20120403 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                          |                                                                                                                                                                                                                                                                           |
| US8146388 BB    | 20091029 | LSAS  | AS    | ASSIGNMENT                                                                    | PARTYTYPE : OWNER<br>OWNER : CORNING INCORPORATED, NEW YORK<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:ANDERSON, JAMES G.; KLINGENSMITH, L. KIRK;<br>PERIS, JAMES P.; AND OTHERS;<br>SIGNING DATES FROM 20091004 TO 20091028;<br>REEL/FRAME:023440/0517 |
| US8146388 BB    | 20120314 | LSGT  | PAT1  | Patented Case                                                                 |                                                                                                                                                                                                                                                                           |
| US8146388 BB    | 20160403 | LSLE  | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                                     |                                                                                                                                                                                                                                                                           |
| US8146388 BB    | 20160502 | LSLE  | -PEX1 | Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362       |                                                                                                                                                                                                                                                                           |

|              |          |      |       |                                               |                                                                                |
|--------------|----------|------|-------|-----------------------------------------------|--------------------------------------------------------------------------------|
| US8146388 BB | 20160502 | LSLE | -STCH | INFORMATION ON STATUS: PATENT DISCONTINUATION | TEXT : PATENT EXPIRED DUE TO NONPAYMENT OF MAINTENANCE FEES UNDER 37 CFR 1.362 |
| US8146388 BB | 20160524 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE | EFFECTIVE DATE : 20160403                                                      |
| US8146388 BB | 20301111 | PEXP |       | Calculated Patent Term Expiry (PTA 378 days)  |                                                                                |

**Title:** CONTINUOUSLY ROTATING VERTICAL CASTING MACHINE

**Abstract:** ABSTRACT OF THE DISCLOSURE

A rotary continuous casting machine in which the casting descends along a vertical axis and which comprises a cage mounted to rotate about the axis at the same speed of rotation as the casting, and a plurality of pairs of rollers mounted in the cage to swing about parallel axes on opposite sides of said vertical axis and press symmetrically against opposite sides of the casting. At least one pair of rollers is driven and serves to advance the casting, and means are provided to offset the effect of centrifugal force on the rollers. It is conventional to produce solid or tubular castings from **molten** metal which are directly solidified in the shape of a desired article.

**Classifications:**

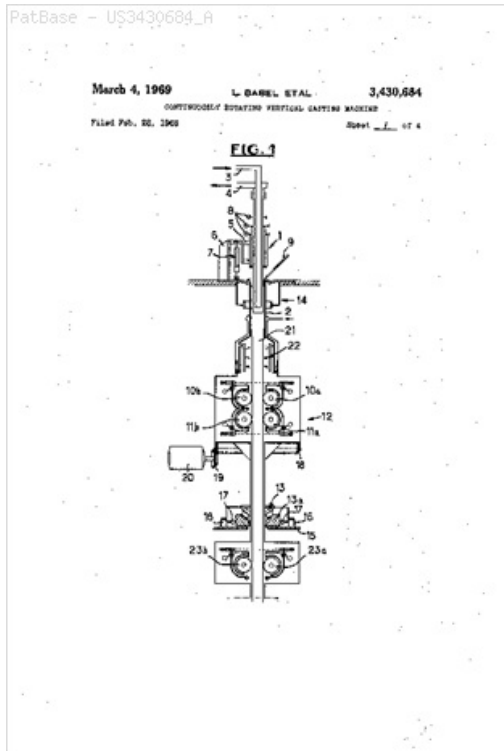
**International (IPC 8-9):** B22D11/00 B22D11/14 (Advanced/Invention); B22D11/00 B22D11/14 (Core/Invention)

**International (IPC 1-7):** B22D11/00 B22D11/02 B22D11/06 B22D11/12 C21B11/06

**CPC:** B22D11/006 B22D11/144

**European:** B22D11/00C B22D11/14D

**US:** 164/282 164/422 164/442 164/465 164/489



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT272547 B         | 19690710         | AT19660001860      | 19660228         |
| BE677268 A         | 19660902         |                    | 19660302         |
| CH445730 A         | 19671031         | CH19660002981      | 19660302         |
| DE1508947 A1       | 19691113         | DE19661508947      | 19660301         |
| DE1508947 B2       | 19740131         | DE19661508947      | 19660301         |
| DE1508947 C3       | 19740905         | DE19661508947      | 19660301         |
| DE1940642 U        | 19660616         | DE1966S056036U     | 19660301         |
| ES323724 A1        | 19670116         | ES19660323724      | 19660302         |
| FR1468682 A        | 19670210         | FR19650007788      | 19650303         |
| GB1134193 A        | 19681120         | GB19660009344      | 19660303         |
| LU50562 A          | 19670905         |                    | 19660303         |
| NL133438 C         | 00000000         |                    | 00000000         |
| NL6602721 A        | 19660905         | NL19660002721      | 19660302         |
| SE300141 B         | 19680408         | SE19660002673      | 19660301         |
| US3430684 A        | 19690304         | US19660530680      | 19660228         |

**Priority:**

FR19650007788 19650303

**Probable Assignee:** ILE D ETUDES DE CENTRIFUGATION

**Assignee(s):** (std): CIVILE D ETUDES DE CENTRIFUGATION SOC ; ETUDES DE CENTRIFUGATION ; SOC CIVILE D ETUDES DE CENTRIFUGATION ; ILE D ETUDES DE CENTRIFUGATION ; CIVILE D ETUDES DE CENTRIFUGAT

**Assignee(s):** CIVILE D ETUDES DE CENTRIFUGATION PARIS SOC ; SOCIETE CIVILE D ETUDES DE CENTRIFUGATION ; SOCIETE CIVILE D ETUDES DE CENTRIFUGATION PARIS

**Inventor(s):** (std): PEYTAVIN PIERRE ; BABEL LOUIS ; PIERRE PEYTAVIN ; PEYTAVIN PIETTE ; PEYTAVIN PIERRE ING ; PEYTAVIN P ; LOUIS BABEL ; BABEL LOUIS ING ; BABEL L

**Inventor(s):** ING PIERRE PEYTAVIN ; ING LOUIS BABEL ; BABEL LOUIS SAUVIGNY LES BOIS ; PEYTAVIN PIERRE AULNOYE AYMERIES

**Legal status (INPADOC)**

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| Patent     | Date recorded | Event group | Code | Event                                | Details |
|------------|---------------|-------------|------|--------------------------------------|---------|
| AT272547 B | 19690710      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| AT272547 B | 19860228      | PEXP        |      | Calculated Patent Term Expiry        |         |

|              |          |      |      |                                                     |
|--------------|----------|------|------|-----------------------------------------------------|
| BE677268 A   | 19660902 | LSPB | +    | published / reissued                                |
| BE677268 A   | 19860302 | PEXP |      | Calculated Patent Term Expiry                       |
| CH445730 A   | 19671031 | LSGT | +    | granted / extensions (spc, cpc, pte)                |
| CH445730 A   | 19860302 | PEXP |      | Calculated Patent Term Expiry                       |
| DE1508947 A1 | 19691113 | LSPB | +    | published / reissued                                |
| DE1508947 B2 | 19740131 | LSPB | +    | published / reissued                                |
| DE1508947 C3 | 19740905 | LSGT | +    | granted / extensions (spc, cpc, pte)                |
| DE1508947 C3 | 19740905 | LSGT | +C3  | GRANT AFTER TWO PUBLICATION STEPS (3RD PUBLICATION) |
| DE1508947 C3 | 19781221 | LSLE | -EHJ | CEASED/NON-PAYMENT OF THE ANNUAL FEE                |
| DE1940642 U  | 19660616 | LSGT | +    | granted / extensions (spc, cpc, pte)                |
| ES323724 A1  | 19670116 | LSGT | +    | granted / extensions (spc, cpc, pte)                |
| FR1468682 A  | 19670210 | LSGT | +    | granted / extensions (spc, cpc, pte)                |
| FR1468682 A  | 19850303 | PEXP |      | Calculated Patent Term Expiry                       |
| GB1134193 A  | 19681120 | LSGT | +    | granted / extensions (spc, cpc, pte)                |
| GB1134193 A  | 19860303 | PEXP |      | Calculated Patent Term Expiry                       |
| LU50562 A    | 19670905 | LSGT | +    | granted / extensions (spc, cpc, pte)                |
| LU50562 A    | 19860304 | PEXP |      | Calculated Patent Term Expiry                       |
| NL133438 C   | 00000000 | LSGT | +    | granted / extensions (spc, cpc, pte)                |
| NL6602721 A  | 19660905 | LSPB | +    | published / reissued                                |
| SE300141 B   | 19680408 | LSPB | +    | published / reissued                                |
| US3430684 A  | 19690304 | LSGT | +    | granted / extensions (spc, cpc, pte)                |

**Title:** BATTERY GRIDS, METHOD AND APPARATUS

**Abstract:** A continuous cast positive grid of lead having substantially improved corrosion resistance and decreased growth in a positive plate of a lead-acid battery and a continuous cast negative grid of lead having substantially increased tensile strength for a lead-acid battery. A web of lead is continuously cast with a series of succeeding grid blanks of uniform thickness which are cold worked to reduce the positive grid thickness by at least 3:1 and the negative grid thickness in the range of about 1.5:1 to 2.8:1 preferably by passing through the nip of each of a plurality of successive compression rollers. Electro-chemically active paste is applied to the reduced webs, preferably flash dried, and individual pasted grids are cut from the reduced and pasted webs to provide positive plates and negative plates for a lead-acid battery. The reduced positive grids have a microstructure with substantially smaller grains and a more uniform grain structure and the reduced positive and negative grids have substantially increased tensile strength after full age hardening compared to as cast continuous grids after full age hardening.

**Classifications:**

**International (IPC 8-9):** B22D25/04 H01M2/14 H01M4/73

H01M4/84 (Advanced/Invention);

H01M4/26 (Advanced/Non-invention);

B22D25/00 H01M4/64 H01M4/72 (Core/Invention);

H01M2/14 (Core/Non-invention)

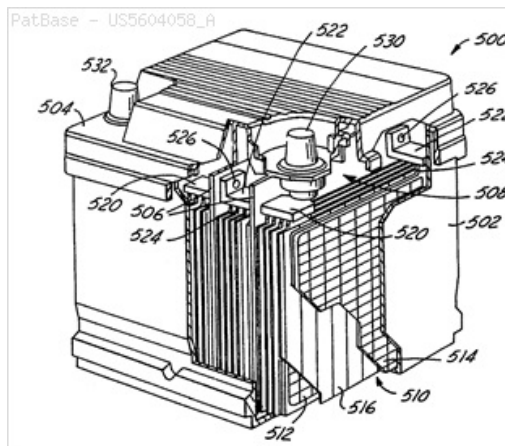
**International (IPC 1-7):** B22D25/04 B23P15/00 H01M2/14 H01M4/20

H01M4/21 H01M4/26 H01M4/73 H01M4/82 H01M4/84

**CPC:** H01M4/73 H01M4/84 Y10T29/10 Y10T29/49115

**European:** H01M4/73 H01M4/84 Y02E60/12

**US:** 164/460 29/2 29/623.5 429/225 429/241 72/199

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT220823 E         | 20020815         | AT19960106406T     | 19960424         |
| AU199540546 A1     | 19961107         | AU19950040546      | 19951220         |
| AU696820 B2        | 19980917         | AU19950040546      | 19951220         |
| DE69622312 D1      | 20020822         | DE19966022312      | 19960424         |
| DE69622312 T2      | 20030130         | DE19966022312T     | 19960424         |
| EP0740357 A1       | 19961030         | EP19960106406      | 19960424         |
| EP0740357 B1       | 20020717         | EP19960106406      | 19960424         |
| ES2177694 T3       | 20021216         | ES19960106406T     | 19960424         |
| JP8315826 A2       | 19961129         | JP19960096074      | 19960326         |
| KR19960039464 A    | 19961125         | KR19960009741      | 19960401         |
| KR960039464 A      | 19961125         | KR19960009741      | 19960401         |
| TW299507 B         | 19970301         | TW19960100218      | 19960110         |
| US5604058 A        | 19970218         | US19950558784      | 19951116         |
| US5611128 A        | 19970318         | US19950430224      | 19950428         |

**Priority:**

US19950430224 19950428 US19950558784 19951116

**Probable Assignee:** WIRTZ MFG CO INC

**Assignee(s):** (std): WIRTZ MFG COMPANY INC ; WIRTZ MFG CO INC ; WIRTZ MFG CO

**Assignee(s):** WIRTZ MFG ; WIRTZ MANUFACTURING COMPANY INC ; WIRTZ MANUFACTURING CO INC ; WIRTZ MANUFACTURING CO INCUS ; WAATSU MFG CO INC ; WIRTZ MANUFACTURING CO ; WIRTZ MANUFACTURING CO INC ; WIRTZ MANUFACTURING CO

**Inventor(s):** (std): WIRTZ JOHN O

**Inventor(s):** JIYON OO WAATSU ; JOHN O WIRTZ

**Agent(s):** PHILLIPS ORMONDE FITZPATRICK

**Designated states:** AT CH DE ES FR GB IT LI

**Legal status (INPADOC)**

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| Patent         | Date recorded | Event group | Code | Event                                                       | Details |
|----------------|---------------|-------------|------|-------------------------------------------------------------|---------|
| AT220823 E     | 20020815      | LSGT        | +    | granted / extensions (spc, cpc, pte)                        |         |
| AT220823 E     | 20021215      | LSPB        | +UEP | PUBLICATION OF TRANSLATION OF EUROPEAN PATENT SPECIFICATION |         |
| AT220823 E     | 20070115      | LSLE        | -REN | CEASED DUE TO NON-PAYMENT OF THE ANNUAL FEE                 |         |
| AT220823 E     | 20160424      | PEXP        |      | Calculated Patent Term Expiry                               |         |
| AU199540546 A1 | 19961107      | LSPB        | +    | published / reissued                                        |         |

|               |          |       |       |                                                                            |                                                                                                                                                                                  |
|---------------|----------|-------|-------|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AU696820 B2   | 19980917 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                       |                                                                                                                                                                                  |
| AU696820 B2   | 20151220 | PEXP  |       | Calculated Patent Term Expiry                                              |                                                                                                                                                                                  |
| DE69622312 D1 | 20030814 | LSGT  | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                    |                                                                                                                                                                                  |
| DE69622312 D1 | 20070215 | LSLE  | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                       |                                                                                                                                                                                  |
| DE69622312 T2 | 20030130 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                       |                                                                                                                                                                                  |
| DE69622312 T2 | 20160424 | PEXP  |       | Calculated Patent Term Expiry                                              |                                                                                                                                                                                  |
| EP0740357 A1  | 19961030 | LSPB  | +     | published / reissued                                                       |                                                                                                                                                                                  |
| EP0740357 A1  | 19970326 | LSSES | +17P  | REQUEST FOR EXAMINATION FILED                                              | EFFECTIVE DATE : 19970122                                                                                                                                                        |
| EP0740357 A1  | 19970730 | LSSES | +17Q  | FIRST EXAMINATION REPORT DESPATCHED                                        | EFFECTIVE DATE : 19970613                                                                                                                                                        |
| EP0740357 B1  | 20020717 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                       |                                                                                                                                                                                  |
| EP0740357 B1  | 20020717 | LSGT  | REG   | REFERENCE TO A NATIONAL CODE                                               | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D                                                                                                                             |
| EP0740357 B1  | 20020731 | LSNP  | REG   | REFERENCE TO A NATIONAL CODE                                               | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                                                                                                               |
| EP0740357 B1  | 20021216 | LSGT  | REG   | REFERENCE TO A NATIONAL CODE                                               | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FG2A<br>REF DOCUMENT NUMBER : 2177694<br>COUNTRY OF REF DOCUMENT : ES<br>KIND CODE OF REF DOCUMENT : T3<br>DESIGNATED STATE(S) : |
| EP0740357 B1  | 20030709 | LSGT  | +26N  | NO OPPOSITION FILED                                                        | EFFECTIVE DATE : 20030422                                                                                                                                                        |
| EP0740357 B1  | 20050401 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : AT<br>PAYMENT DATE : 20050401<br>YEAR OF FEE PAYMENT : 10                                                                                              |
| EP0740357 B1  | 20050418 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20050418<br>YEAR OF FEE PAYMENT : 10                                                                                              |
| EP0740357 B1  | 20050420 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20050420<br>YEAR OF FEE PAYMENT : 10                                                                                              |
| EP0740357 B1  | 20050421 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : CH<br>PAYMENT DATE : 20050421<br>YEAR OF FEE PAYMENT : 10                                                                                              |
| EP0740357 B1  | 20050512 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : ES<br>PAYMENT DATE : 20050512<br>YEAR OF FEE PAYMENT : 10                                                                                              |
| EP0740357 B1  | 20050531 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO] | COUNTRY OF REF DOCUMENT : DE<br>PAYMENT DATE : 20050531<br>YEAR OF FEE PAYMENT : 10                                                                                              |
| EP0740357 B1  | 20060424 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT                     | COUNTRY OF REF DOCUMENT : AT<br>NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-                                                                                                    |

|                 |          |       |       |                                                                                                                                             |                                                                                                                                                                                    |
|-----------------|----------|-------|-------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP0740357 B1    | 20060424 | LSLE  | -PG25 | INFORMATION FROM NATIONAL OFFICE TO EPO]<br>LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO] | PAYMENT OF DUE FEES<br>LAPSED DATE : 20060424<br><br>COUNTRY OF REF DOCUMENT : GB<br>NOTIFICATION OF LAPSE :<br>LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20060424 |
| EP0740357 B1    | 20060425 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO]                                             | COUNTRY OF REF DOCUMENT : ES<br>NOTIFICATION OF LAPSE :<br>LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20060425                                                      |
| EP0740357 B1    | 20060430 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO]                                             | COUNTRY OF REF DOCUMENT : CH<br>NOTIFICATION OF LAPSE :<br>LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20060430                                                      |
| EP0740357 B1    | 20060430 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO]                                             | COUNTRY OF REF DOCUMENT : LI<br>NOTIFICATION OF LAPSE :<br>LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20060430                                                      |
| EP0740357 B1    | 20060430 | LSFE  | +PGFP | ANNUAL FEE PAID TO NATIONAL OFFICE [ANNOUNCED FROM NATIONAL OFFICE TO EPO]                                                                  | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20060430<br>YEAR OF FEE PAYMENT : 11                                                                                                |
| EP0740357 B1    | 20061101 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO]                                             | COUNTRY OF REF DOCUMENT : DE<br>NOTIFICATION OF LAPSE :<br>LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20061101                                                      |
| EP0740357 B1    | 20061215 | LSLE  | REG   | REFERENCE TO A NATIONAL CODE                                                                                                                | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                 |
| EP0740357 B1    | 20061227 | LSLE  | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                                                                               | REF COUNTRY CODE : EP<br>EFFECTIVE DATE : 20060424                                                                                                                                 |
| EP0740357 B1    | 20070309 | LSLE  | REG   | REFERENCE TO A NATIONAL CODE                                                                                                                | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST<br>EFFECTIVE DATE : 20061230                                                                                                    |
| EP0740357 B1    | 20070716 | LSLE  | REG   | REFERENCE TO A NATIONAL CODE                                                                                                                | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FD2A<br>EFFECTIVE DATE : 20060425                                                                                                  |
| EP0740357 B1    | 20080430 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO]                                             | COUNTRY OF REF DOCUMENT : FR<br>NOTIFICATION OF LAPSE :<br>LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20060502                                                      |
| EP0740357 B1    | 20090930 | LSLE  | -PG25 | LAPSED IN A CONTRACTING STATE [ANNOUNCED VIA POSTGRANT INFORMATION FROM NATIONAL OFFICE TO EPO]                                             | COUNTRY OF REF DOCUMENT : IT<br>NOTIFICATION OF LAPSE :<br>LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>LAPSED DATE : 20070424                                                      |
| EP0740357 B1    | 20160424 | PEXP  |       | Calculated Patent Term Expiry                                                                                                               |                                                                                                                                                                                    |
| ES2177694 T3    | 20021216 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                                                                                        |                                                                                                                                                                                    |
| ES2177694 T3    | 20160424 | PEXP  |       | Calculated Patent Term Expiry                                                                                                               |                                                                                                                                                                                    |
| JP8315826 A2    | 19961129 | LSPB  | +     | published / reissued                                                                                                                        |                                                                                                                                                                                    |
| KR19960039464 A | 19961125 | LSPB  | +     | published / reissued                                                                                                                        |                                                                                                                                                                                    |
| KR960039464 A   | 19961125 | LSPB  | +     | published / reissued                                                                                                                        |                                                                                                                                                                                    |
| KR960039464 A   | 20010302 | LSSES | A201  | REQUEST FOR EXAMINATION                                                                                                                     |                                                                                                                                                                                    |

|               |          |       |       |                                                   |                                                                                                                                                                                                      |
|---------------|----------|-------|-------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KR960039464 A | 20030224 | LSSES | -E902 | NOTIFICATION OF REASON FOR REFUSAL                |                                                                                                                                                                                                      |
| KR960039464 A | 20030825 | LSGT  | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT |                                                                                                                                                                                                      |
| TW299507 B    | 19970301 | LSGT  | +     | granted / extensions (spc, cpc, pte)              |                                                                                                                                                                                                      |
| TW299507 B    | 20160110 | PEXP  |       | Calculated Patent Term Expiry                     |                                                                                                                                                                                                      |
| US5604058 A   | 19970218 | LSGT  | +     | granted / extensions (spc, cpc, pte)              |                                                                                                                                                                                                      |
| US5604058 A   | 19970113 | LSGT  | PAT1  | Patented Case                                     |                                                                                                                                                                                                      |
| US5604058 A   | 19970113 | LSGT  | STCF  | INFORMATION ON STATUS: PATENT GRANT               | TEXT : PATENTED CASE                                                                                                                                                                                 |
| US5604058 A   | 20000809 | LSFE  | +FPAY | FEE PAYMENT                                       | YEAR OF FEE PAYMENT : 4                                                                                                                                                                              |
| US5604058 A   | 20040803 | LSFE  | +FPAY | FEE PAYMENT                                       | YEAR OF FEE PAYMENT : 8                                                                                                                                                                              |
| US5604058 A   | 20080718 | LSFE  | +FPAY | FEE PAYMENT                                       | YEAR OF FEE PAYMENT : 12                                                                                                                                                                             |
| US5604058 A   | 20151116 | PEXP  |       | Calculated Patent Term Expiry                     |                                                                                                                                                                                                      |
| US5611128 A   | 19970318 | LSGT  | +     | granted / extensions (spc, cpc, pte)              |                                                                                                                                                                                                      |
| US5611128 A   | 19950428 | LSAS  | AS    | ASSIGNMENT                                        | PARTYTYPE : OWNER<br>OWNER : WIRTZ MANUFACTURING CO., INC., MICHIGAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:WIRTZ, JOHN O.;<br>REEL/FRAME:007480/0815<br>EFFECTIVE DATE : 19950426 |
| US5611128 A   | 19970307 | LSGT  | PAT1  | Patented Case                                     |                                                                                                                                                                                                      |
| US5611128 A   | 19970307 | LSGT  | STCF  | INFORMATION ON STATUS: PATENT GRANT               | TEXT : PATENTED CASE                                                                                                                                                                                 |
| US5611128 A   | 20000913 | LSFE  | +FPAY | FEE PAYMENT                                       | YEAR OF FEE PAYMENT : 4                                                                                                                                                                              |
| US5611128 A   | 20040826 | LSFE  | +FPAY | FEE PAYMENT                                       | YEAR OF FEE PAYMENT : 8                                                                                                                                                                              |
| US5611128 A   | 20080718 | LSFE  | +FPAY | FEE PAYMENT                                       | YEAR OF FEE PAYMENT : 12                                                                                                                                                                             |
| US5611128 A   | 20150428 | PEXP  |       | Calculated Patent Term Expiry                     |                                                                                                                                                                                                      |

**Title:** METHOD AND APPARATUS FOR VERTICALLY SUPPORTING AND HEAT TREATING A GLASS SHEET

**Abstract:** A method of supporting a sheet of glass in an upright position during treatment at elevated temperature, comprises resting the lower edge of the sheet on a solid support, and supporting the sheet laterally by applying hot gases on opposite surfaces thereof. In one apparatus for carrying out the method as applied to tempering glass sheets, the glass sheet passes through four sections A-feeding, B-heating, C-quenching, and D-delivery. A-Feeding.-The bottom edge of a sheet of glass is placed in the circumferential grooves 21 of horizontal support rolls 20, and is held upright by passing through a framework 28 having freely rotatable rolls 32. From this section the sheet is moved along by the driven rolls 20 into section B-Heating. The bottom edge of the glass is retained in aligned grooves 51 of rolls 50, the sheet of glass passing into a furnace 40 having side walls in which are thin plates 72, 74 defining a restricted passage 75 for the glass to pass through, and being connected at their lower ends to a narrow opening 53 which is at the apex of a plenum chamber 52 situated below the rolls 50. Radiant heater elements 76 are fixedly spaced from the outer sides of plates 72, 74. The plenum chamber 52 is fed with a mixture of air and gas which is fired in burners 80, the quantities of each being controlled so that flow of the hot gases which then passes upwardly on either side of the glass sheet is strictly controlled at a known pressure, the pressure on either side being balanced against the other so as to maintain the sheet vertical. The thus heated sheet is then passed to section C-Quenching. The glass sheet is fed into circumferential grooves 56 in rolls 55, the grooves being provided with insulated liners. The sheet is positioned between vertical frames 100 which contain plenum chambers 114, 116 spaced on each side of the sheet, each chamber containing a series of slotted openings 118 through which cold air supplied to the chambers is blown to quench the sheet quickly. Oblique baffles 124 extending inwardly and upwardly about halfway up each chamber give the air a vertical component of flow, coupled with other similarly disposed baffles 127 at the base of the chamber, thus maintaining the sheet vertical, especially by carefully controlling the pressure of the air on each side of the sheet. The thus tempered sheet is then passed out into the delivery section D which is similar in all respects to section A. The rolls 20, 50, 56 and 58 are all chain driven from a single motor. In using the above apparatus to anneal glass sheets, the plenum chambers of the quenching section are sub-divided along their length so that air at different temperatures may be blown on to the sheet to cool it at a rate defined by its appropriate annealing curve. This method may also be used for coating glass sheets in which case a glass sheet pre-coated with a frit or enamel is passed through the apparatus to fire the coating and thus make it adhere to the glass. In an example, there is sprayed on to the glass an enamel frit having the composition bentonite 1.2 gms. cryolite 0.8 gms., boric acid 0.3 gms. methanol 10 c.c., n-propanol 15 c.c., water 75 c.c., sodium pyrophosphate 0.1 gm., aluminium powder 10 gms. The enamel is fired at 1250 DEG F. by passing the coated sheet through the above apparatus.

**Classifications:**

**International (IPC 8-9):** C03B27/056 C03B29/02 C03B29/10 C03B35/14 C03C17/06 (Advanced/Invention);

C03B27/00 C03B29/00 C03B35/00 C03C17/06 (Core/Invention)

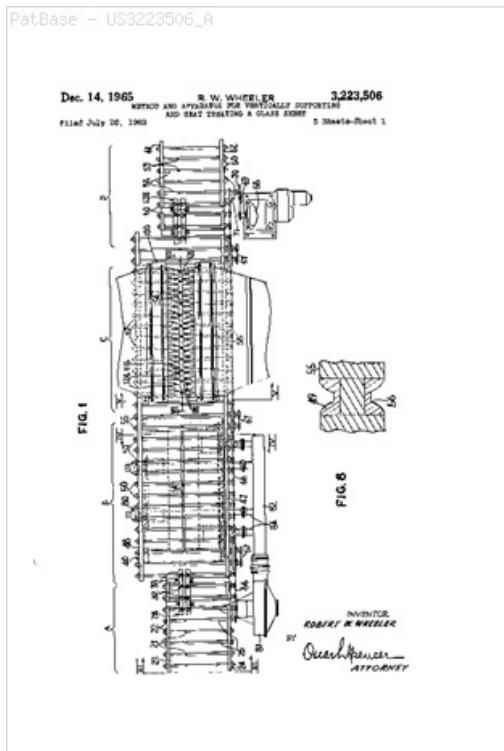
**International (IPC 1-7):** B65G49/00 C03B23/02 C03B27/00 C03B27/04 C03B29/02 C03B29/04 C03B35/14

**CPC:** C03B27/0417 C03B27/056 C03B29/025 C03B29/10 C03B35/14 C03B40/005 C03C17/06 C03C2217/263 C03C2218/17

**European:** C03B27/04C C03B27/056 C03B29/02B C03B29/10 C03B35/14 C03B40/00F C03C17/06 M03C217/263 M03C218/170

**US:** 432/11 432/18 432/77 65/114 65/182.2 65/273 65/348

PatBase - US3223506\_A



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| BE635354 A         | 00000000         |                    | 00000000         |
| CH435111 A         | 19670430         | CH19630009140      | 19630723         |
| DE1471942 A1       | 19690313         | DE19631471942      | 19630722         |
| DE1471942 B2       | 19700506         | DE19631471942      | 19630722         |
| ES290003 A1        | 19631201         | ES19630290003      | 19630715         |
| FR1368386 A        | 19640731         | FR19630942234      | 19630722         |
| GB1012804 A        | 19651208         | GB19630028636      | 19630719         |
| NL295341 A         | 00000000         |                    | 00000000         |
| US3223506 A        | 19651214         | US19620212682      | 19620726         |

**Priority:**

US19620212682 19620726 FR19630942234 19630722

**Probable Assignee:** PITTSBURGH PLATE GLASS CO

**Assignee(s):** (std): PITTSBURGH PLATE GLASS CO

**Assignee(s):** PITTSBURGH PLATE GLASS COMPANY

**Inventor(s):** (std): WHEELER ROBERT W ; ROBERT WILLIAM WHEELER ; WILLIAM WHEELER ROBERT

**Legal status (INPADOC)**

| Patent       | Date recorded | Event group | Code | Event                                | Details |
|--------------|---------------|-------------|------|--------------------------------------|---------|
| BE635354 A   | 00000000      | LSPB        | +    | published / reissued                 |         |
| BE635354 A   | 19200101      | PEXP        |      | Calculated Patent Term Expiry        |         |
| CH435111 A   | 19670430      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| CH435111 A   | 19830723      | PEXP        |      | Calculated Patent Term Expiry        |         |
| DE1471942 A1 | 19690313      | LSPB        | +    | published / reissued                 |         |
| DE1471942 B2 | 19700506      | LSPB        | +    | published / reissued                 |         |
| ES290003 A1  | 19631201      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| ES290003 A1  | 19831201      | PEXP        |      | Calculated Patent Term Expiry        |         |
| FR1368386 A  | 19640731      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| FR1368386 A  | 19830722      | PEXP        |      | Calculated Patent Term Expiry        |         |
| GB1012804 A  | 19651208      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| GB1012804 A  | 19830719      | PEXP        |      | Calculated Patent Term Expiry        |         |
| NL295341 A   | 00000000      | LSPB        | +    | published / reissued                 |         |
| US3223506 A  | 19651214      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |

**Title:** METHOD AND APPARATUS FOR REDUCING HEAT LOSS FROM EDGE DIRECTORS IN A GLASS MAKING PROCESS

**Abstract:** An apparatus for drawing a glass ribbon including a forming body having an edge director attached thereto, and an edge roll assembly disposed below the edge director, the edge roll assembly comprising a contact member coupled to the edge **roller shaft** and a thermal shroud disposed about the shaft to reduce heat loss from the edge director. A method of drawing glass using the edge roll assembly is also described.

**Classifications:**

**International (IPC 8-9):** C03B15/02 C03B17/04 C03B17/06

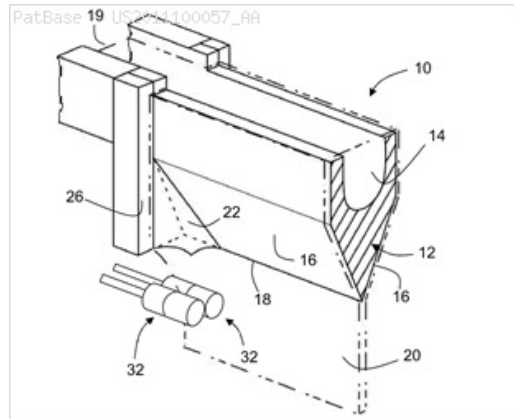
C03B18/02 (Advanced/Invention);

C03B17/04 (Core/Non-invention)

**CPC:** C03B17/064 C03B17/068 C03B18/02 C03B15/02 Y02P40/57

**European:** C03B17/06D C03B17/06G

**US:** 65/199 65/199S 65/90 65/90P



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN102666410 A      | 20120912         | CN201080049659     | 20101026         |
| CN102666410 B      | 20141105         | CN201080049659     | 20101026         |
| JP2013509350 T2    | 20130314         | JP20120536933T     | 20101026         |
| JP546641 B2        | 20140709         | JP20120536933T     | 20101026         |
| KR101745035 B1     | 20170620         | KR20127013645      | 20101026         |
| KR20120092640 A    | 20120821         | KR20127013645      | 20101026         |
| TW201127760 A      | 20110816         | TW20100136550      | 20101026         |
| TWI464122 B        | 20141211         | TW20100136550      | 20101026         |
| US2011100057 AA    | 20110505         | US20090608452      | 20091029         |
| WO11059690 A2      | 20110519         | WO2010US54012      | 20101026         |
| WO11059690 A3      | 20110721         | WO2010US54012      | 20101026         |

**Priority:**

US20090608452 20091029 WO2010US54012 20101026

**Probable Assignee:** CORNING INC

**Assignee(s):** (std): CORNING CO LTD ; CORNING INC ; GAYLO KEITH R

**Inventor(s):** (std): GAYLO KEITH R ; GAYLO KEITH RAYMOND

**Agent(s):** ABLE KEVIN M

**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 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                                                           |
|-----------------|---------------|-------------|-------|-------------------------------------------------------------------------------|-------------------------------------------------------------------|
| CN102666410 A   | 20120912      | LSPB        | +     | published / reissued                                                          |                                                                   |
| CN102666410 A   | 20120912      | LSPB        | +C06  | PUBLICATION                                                                   |                                                                   |
| CN102666410 B   | 20141105      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                          |                                                                   |
| CN102666410 B   | 20141105      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL                                              |                                                                   |
| CN102666410 B   | 20301026      | PEXP        |       | Calculated Patent Term Expiry                                                 |                                                                   |
| JP2013509350 T2 | 20130314      | LSPB        | +     | published / reissued                                                          |                                                                   |
| JP2013509350 T2 | 20131025      | LSSES       | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION                                   | TEXT : JAPANESE INTERMEDIATE CODE: A621 EFFECTIVE DATE : 20131024 |
| JP2013509350 T2 | 20140407      | LSGT        | +TRDD | DECISION OF GRANT OR REJECTION WRITTEN                                        |                                                                   |
| JP2013509350 T2 | 20140416      | LSGT        | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | TEXT : JAPANESE INTERMEDIATE CODE: A01 EFFECTIVE DATE : 20140415  |

|                 |          |       |       |                                                        |                                                                                                                                                                                                 |
|-----------------|----------|-------|-------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP2013509350 T2 | 20140522 | LSFE  | +A61  | FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)  | TEXT : JAPANESE INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20140513                                                                                                                             |
| JP2013509350 T2 | 20140523 | LSGT  | +R150 | CERTIFICATE OF PATENT OR REGISTRATION OF UTILITY MODEL | TEXT : JAPANESE INTERMEDIATE CODE: R150<br>REF DOCUMENT NUMBER : 5546641<br>COUNTRY OF REF DOCUMENT : JP                                                                                        |
| JP5546641 B2    | 20140709 | LSGT  | +     | granted / extensions (spc, cpc, pte)                   |                                                                                                                                                                                                 |
| JP5546641 B2    | 20140417 | LSGT  | +A01  | 特許査定書 (Decision of patent grant)                       |                                                                                                                                                                                                 |
| JP5546641 B2    | 20140520 | LSFE  | R100  | 特許料納付書 (Patent fee payment form)                       |                                                                                                                                                                                                 |
| JP5546641 B2    | 20140523 | LSGT  | +R150 | 特許証 (Patent certificate)                               |                                                                                                                                                                                                 |
| JP5546641 B2    | 20170511 | LSFE  | R20   | 特許料納付書 (Patent fee payment form)                       |                                                                                                                                                                                                 |
| JP5546641 B2    | 20170516 | LSFE  | +R250 | RECEIPT OF ANNUAL FEES                                 | TEXT : JAPANESE INTERMEDIATE CODE: R250                                                                                                                                                         |
| JP5546641 B2    | 20180426 | LSFE  | R20   | 特許料納付書 (Patent fee payment form)                       |                                                                                                                                                                                                 |
| JP5546641 B2    | 20180508 | LSFE  | +R250 | RECEIPT OF ANNUAL FEES                                 | TEXT : JAPANESE INTERMEDIATE CODE: R250                                                                                                                                                         |
| JP5546641 B2    | 20190509 | LSFE  | R20   | 特許料納付書 (Patent fee payment form)                       |                                                                                                                                                                                                 |
| JP5546641 B2    | 20190514 | LSFE  | +R250 | RECEIPT OF ANNUAL FEES                                 | TEXT : JAPANESE INTERMEDIATE CODE: R250                                                                                                                                                         |
| JP5546641 B2    | 20301026 | PEXP  |       | Calculated Patent Term Expiry                          |                                                                                                                                                                                                 |
| KR101745035 B1  | 20170620 | LSGT  | +     | granted / extensions (spc, cpc, pte)                   |                                                                                                                                                                                                 |
| KR101745035 B1  | 20301026 | PEXP  |       | Calculated Patent Term Expiry                          |                                                                                                                                                                                                 |
| KR20120092640 A | 20120821 | LSPB  | +     | published / reissued                                   |                                                                                                                                                                                                 |
| KR20120092640 A | 20151014 | LSSES | A201  | REQUEST FOR EXAMINATION                                |                                                                                                                                                                                                 |
| KR20120092640 A | 20170516 | LSGT  | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT      |                                                                                                                                                                                                 |
| KR20120092640 A | 20170601 | LSGT  | +GRNT | WRITTEN DECISION TO GRANT                              |                                                                                                                                                                                                 |
| TW201127760 A   | 20110816 | LSPB  | +     | published / reissued                                   |                                                                                                                                                                                                 |
| TWI464122 B     | 20141211 | LSGT  | +     | granted / extensions (spc, cpc, pte)                   |                                                                                                                                                                                                 |
| TWI464122 B     | 20301026 | PEXP  |       | Calculated Patent Term Expiry                          |                                                                                                                                                                                                 |
| US2011100057 AA | 20110505 | LSPB  | +     | published / reissued                                   |                                                                                                                                                                                                 |
| US2011100057 AA | 20091029 | LSAS  | AS    | ASSIGNMENT                                             | PARTYTYPE : OWNER<br>OWNER : CORNING INCORPORATED, NEW YORK<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:GAYLO, KEITH R.;<br>REEL/FRAME:023443/0711<br>EFFECTIVE DATE : 20091029 |
| US2011100057 AA | 20120518 | LSWD  | -ABD3 | Abandoned -- Failure to Respond to an Office Action    |                                                                                                                                                                                                 |
| WO11059690 A2   | 20110519 | LSPB  | +     | published / reissued                                   |                                                                                                                                                                                                 |
| WO11059690 A2   | 20101026 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE            | REF DOCUMENT NUMBER : 201080049659.6<br>COUNTRY OF REF DOCUMENT : CN                                                                                                                            |
| WO11059690 A3   | 20120430 | LSNE  | NENP  | NON-ENTRY INTO THE NATIONAL PHASE IN:                  | REF COUNTRY CODE : DE                                                                                                                                                                           |
| WO11059690 A3   | 20120501 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE            | REF DOCUMENT NUMBER : 2012536933<br>COUNTRY OF REF DOCUMENT : JP                                                                                                                                |

|               |          |      |      |                                                       |                                                                                                                                      |
|---------------|----------|------|------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| WO11059690 A3 | 20120525 | LSNP | ENP  | ENTRY INTO THE<br>NATIONAL PHASE IN:                  | REF DOCUMENT NUMBER :<br>20127013645<br>COUNTRY OF REF<br>DOCUMENT : KR<br>KIND CODE OF REF<br>DOCUMENT : A<br>DESIGNATED STATE(S) : |
| WO11059690 A3 | 20121121 | LSNE | -122 | EP: PCT APPLICATION<br>NON-ENTRY IN<br>EUROPEAN PHASE | REF DOCUMENT NUMBER :<br>10830422<br>COUNTRY OF REF<br>DOCUMENT : EP<br>KIND CODE OF REF<br>DOCUMENT : A2<br>DESIGNATED STATE(S) :   |

**Title:** MULTI-STAGE ROLL TYPE SHEET MOLDING APPARATUS

**Abstract:** A multi-stage roll type sheet molding apparatus includes four or more molding rolls including a touch molding roll, a main molding roll and finish molding rolls disposed in the horizontal direction in parallel to each other, in which a **molten** sheet is supplied downward from above to a first nip part interposed between the touch molding roll and main molding roll, the sheet is compressed by the molding rolls, and the compressed sheet is windingly fed sequentially from the main molding roll to the finish molding rolls, thereby molding a sheet having a specific thickness. The apparatus further includes a rear-stage side rail for guiding the finish molding rolls in a horizontally movable manner and second to fourth hydraulic cylinders for horizontally moving the finish molding rolls to in such a manner that they can pressurize the sheet.

**Classifications:**

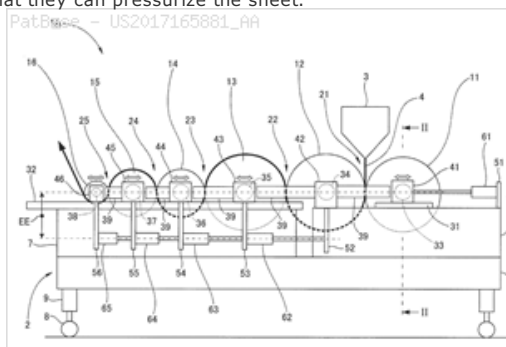
**International (IPC 8-9):** B29C43/24 B29C43/46

B29C47/88 (Advanced/Invention);

B29C33/02 B29K105/00 B29L7/00 (Advanced/Non-invention)

**CPC:** B29C43/46 B29C43/24 B29C2043/467 B29K2105/0067

B29L2007/002 B29C33/026 B29C43/245 B29C2043/468



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP2017105127 A2    | 20170615         | JP20150242516      | 20151211         |
| JP6207579 B2       | 20171004         | JP20150242516      | 20151211         |
| US2017165881 AA    | 20170615         | US20160371357      | 20161207         |
| US10179427 BB      | 20190115         | US20160371357      | 20161207         |

**Priority:**

JP20150242516 20151211

**Probable Assignee:** SAMSUNG ELECTRONICS CO LTD

**Assignee(s):** (std): JAPAN STEEL WORKS LTD

**Assignee(s):** JAPAN STEEL WORKS LTD THE ; SAMSUNG ELECTRONICS CO LTD

**Inventor(s):** (std): SHIMODORI MAKOTO ; SHINOBU DANI KOJI ; CHIKARAISHI ATSUSHI ; RIKIISHI ATSUSHI ; OSHITANI KOJI

**Agent(s):** SUGHRUE MION PLLC

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                                                         | Details                                                                                                  |
|-----------------|---------------|-------------|-------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| JP2017105127 A2 | 20170615      | LSPB        | +     | published / reissued                                                          |                                                                                                          |
| JP2017105127 A2 | 20170614      | LSSES       | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                           | TEXT : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20170614                                     |
| JP2017105127 A2 | 20170810      | LSRE        | A521  | WRITTEN AMENDMENT                                                             | TEXT : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20170810                                     |
| JP2017105127 A2 | 20170828      | LSGT        | +TRDD | DECISION OF GRANT OR REJECTION WRITTEN                                        |                                                                                                          |
| JP2017105127 A2 | 20170830      | LSGT        | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | TEXT : JAPANESE INTERMEDIATE CODE: A01<br>EFFECTIVE DATE : 20170830                                      |
| JP2017105127 A2 | 20170914      | LSFE        | +A61  | FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)                         | TEXT : JAPANESE INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20170905                                      |
| JP2017105127 A2 | 20170915      | LSGT        | +R150 | CERTIFICATE OF PATENT OR REGISTRATION OF UTILITY MODEL                        | TEXT : JAPANESE INTERMEDIATE CODE: R150<br>REF DOCUMENT NUMBER : 6207579<br>COUNTRY OF REF DOCUMENT : JP |
| JP6207579 B2    | 20171004      | LSGT        | +     | granted / extensions                                                          |                                                                                                          |

|                 |          |      |       |                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------|----------|------|-------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP6207579 B2    | 20170907 | LSGT | +A01  | (spc, cpc, pte)<br>特許査定書<br>(Decision of<br>patent grant) |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| JP6207579 B2    | 20170912 | LSFE | R100  | 特許料納付書<br>(Patent fee<br>payment<br>form)                 |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| JP6207579 B2    | 20170915 | LSGT | +R150 | 特許証 (Patent<br>certificate)                               |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| JP6207579 B2    | 20351211 | PEXP |       | Calculated<br>Patent Term<br>Expiry                       |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| US10179427 BB   | 20190115 | LSGT | +     | granted /<br>extensions<br>(spc, cpc, pte)                |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| US10179427 BB   | 20161207 | LSAS | AS    | ASSIGNMENT                                                | PARTYTYPE : OWNER<br>OWNER : SAMSUNG ELECTRONICS<br>CO., LTD., KOREA, REPUBLIC OF<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:SHINOBU DANI, KOJI;<br>SHIMODORI, MAKOTO; CHIKARAISHI,<br>ATSUSHI; REEL/FRAME:040586/0410<br>EFFECTIVE DATE : 20161130                                                                                                                                                            |
| US10179427 BB   | 20161221 | LSAS | AS    | ASSIGNMENT                                                | PARTYTYPE : OWNER<br>OWNER : THE JAPAN STEEL WORKS.<br>LTD., JAPAN<br>OLDPARTY : CORRECTIVE<br>ASSIGNMENT TO CORRECT THE<br>LISTING OF THE ASSIGNEE'S ADDRESS<br>PREVIOUSLY RECORDED ON REEL<br>040586 FRAME 0410. ASSIGNOR(S)<br>HEREBY CONFIRMS THE ASSIGNMENT<br>OF THE ASSIGNOR'S INTEREST;<br>ASSIGNORS:SHINOBU DANI, KOJI;<br>SHIMODORI, MAKOTO; CHIKARAISHI,<br>ATSUSHI; REEL/FRAME:041208/0857<br>EFFECTIVE DATE : 20161130 |
| US10179427 BB   | 20181222 | LSGT | PAT1  | Patented Case                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| US10179427 BB   | 20370103 | PEXP |       | Calculated<br>Patent Term<br>Expiry (PTA 27<br>days)      |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| US2017165881 AA | 20170615 | LSPB | +     | published /<br>reissued                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| US2017165881 AA | 20180404 | LSES | NFA1  | Non Final<br>Action Mailed                                |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| US2017165881 AA | 20181222 | LSGT | STCF  | INFORMATION<br>ON STATUS:<br>PATENT<br>GRANT              | TEXT : PATENTED CASE                                                                                                                                                                                                                                                                                                                                                                                                                |

**Title:** LATCHING MECHANISM FOR THE BACKUP ROLL OF A ROLL FUSER EMPLOYED IN A COPIER APPARATUS

**Abstract:** Mechanism for latching a backup roll into engagement with a heated fuser roll structure. The mechanism is characterized by a four pivot linkage including a first fixed pivot supporting the backup roll for movement. The linkage is so arranged as to require a minimum force for holding the backup roll in engagement with the fuser roll structure. Solenoid means serves to actuate the linkage mechanism and also provides the means for maintaining roll engagement at a substantially reduced power requirement compared to the actuating power required.

**Classifications:**

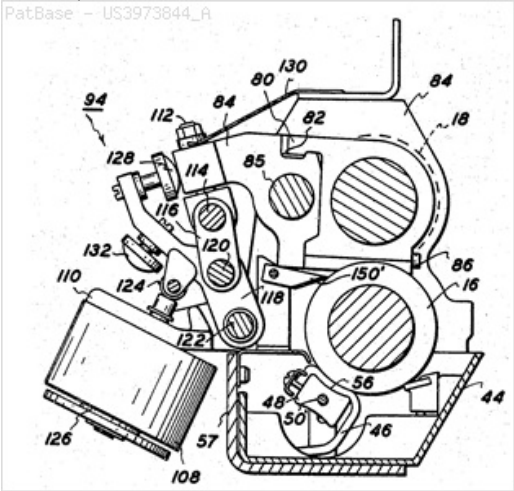
**International (IPC 8-9):** G03G15/20 (Advanced/Invention);  
G03G15/20 (Core/Invention)

**International (IPC 1-7):** G03G15/00 G03G15/20

**CPC:** G03G15/2032 G03G2215/20

**European:** G03G15/20H2P1 S03G215/20

**US:** 100/176 118/60 219/469 355/3R 399/332 432/228 432/60



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CA1066348 A1       | 19791113         | CA19750224188      | 19750409         |
| GB1509246 A        | 19780504         | GB19750019402      | 19750508         |
| US3973844 A        | 19760810         | US19740473847      | 19740528         |

**Priority:**

US19740473847 19740528

**Probable Assignee:**

XEROX CORP

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

XEROX CORP

**Assignee(s):**

MCCARROLL ALAN F

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

MCCARROLL ALAN F

**Legal status (INPADOC)**

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| Patent      | Date recorded | Event group | Code | Event                                                                                                  | Details |
|-------------|---------------|-------------|------|--------------------------------------------------------------------------------------------------------|---------|
| GB1509246 A | 19780504      | LSGT        | +    | granted / extensions (spc, cpc, pte)                                                                   |         |
| GB1509246 A | 19790104      | LSRV        | CSNS | APPLICATION OF WHICH COMPLETE SPECIFICATION HAVE BEEN ACCEPTED AND PUBLISHED, BUT PATENT IS NOT SEALED |         |
| GB1509246 A | 19950508      | PEXP        |      | Calculated Patent Term Expiry                                                                          |         |
| US3973844 A | 19760810      | LSGT        | +    | granted / extensions (spc, cpc, pte)                                                                   |         |

**Title:** APPARATUS HAVING SLIDING MEMBER WITH PRECURSOR MATERIAL PROVIDING SOLID LUBRICANT MATERIAL DURING SLIDING

**Abstract:** An apparatus comprising a plurality of sliding members, at least one of the sliding members being a self-lubricating-function sliding member characterized by containing a precursor compound which produces a solid-lubricating compound during sliding by reacting with an atmosphere in which the sliding member is used or a component of a material with which the sliding member is in sliding contact.

**Classifications:**

**International (IPC 8-9):** C03C14/00 C10M103/00 C10M103/04 C10M103/06 C10M109/02 C23C2/00 F16C33/04 F16C33/12 (Advanced/Invention); B21B27/00 C10N10/00 C10N10/04 C10N10/06 C10N10/10 C10N10/12 C10N20/00 C10N40/02 C10N70/00 (Advanced/Non-invention); C03C14/00 C10M103/00 C10M109/00 C23C2/00 F16C33/04 (Core/Invention)

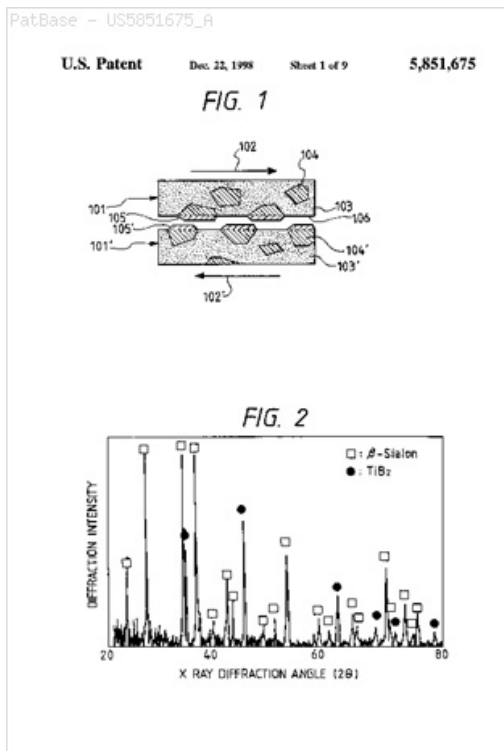
**International (IPC 1-7):** B32B17/00 C10M103/00 C10M103/04 C10M103/06 C10M109/02 C10N10/00 C10N10/04 C10N10/06 C10N10/10 C10N10/12 C10N20/00 C10N40/02 C10N70/00 C23C2/00 F16C33/12

**CPC:** Y10S384/912 Y10S384/913 F16C33/12 C03C14/004 C23C2/003 F16C33/043 Y10T29/53104 Y10T428/31678

**European:** C03C14/00D C23C2/00B F16C33/04C F16C33/12

**US:** 29/724 384/13 384/912 384/913 384/918 428/426 428/457

428/688 428/698 428/702



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP8048985 A2       | 19960220         | JP19950130031      | 19950529         |
| KR19950031267 A    | 19951218         | KR19950013628      | 19950529         |
| KR950031267 A      | 19951218         | KR19950013628      | 19950529         |
| TW344779 B         | 19981111         | TW19950105358      | 19950526         |
| US5851675 A        | 19981222         | US19950454564      | 19950530         |

**Priority:**

JP19940137850 19940530 JP19950130031 19950529

**Probable Assignee:** HITACHI LTD

**Assignee(s):** (std): HITACHI LTD

**Assignee(s):** HITACHI SEISAKUSHO KK

**Inventor(s):** (std): NAKAGAWA HASEO ; NAKAGAWA MITSUO ; NAKAGAWA MOROO ; OKAWAUCHI TOSHIHIKO ; OKOCHI NORIHIKO ; OKOUCHI TAKAHIKO ; OYAGI TOMOHITO ; OYAGI TOMOHITO ; SAKAI JUNJI ; YASUOKA YOSHIYUKI ; YASUTOMI YOSHIYUKI

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                | Details |
|-----------------|---------------|-------------|-------|--------------------------------------|---------|
| JP8048985 A2    | 19960220      | LSPB        | +     | published / reissued                 |         |
| KR19950031267 A | 19951218      | LSPB        | +     | published / reissued                 |         |
| KR950031267 A   | 19951218      | LSPB        | +     | published / reissued                 |         |
| KR950031267 A   | 20000526      | LSSES       | A201  | REQUEST FOR EXAMINATION              |         |
| KR950031267 A   | 20020628      | LSSES       | -E902 | NOTIFICATION OF REASON FOR REFUSAL   |         |
| KR950031267 A   | 20021031      | LSRV        | -E601 | DECISION TO REFUSE APPLICATION       |         |
| TW344779 B      | 19981111      | LSGT        | +     | granted / extensions (spc, cpc, pte) |         |

|             |          |      |       |                                                                                     |                                                                                                                                                                                                                                             |
|-------------|----------|------|-------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TW344779 B  | 20150526 | PEXP |       | Calculated Patent<br>Term Expiry                                                    |                                                                                                                                                                                                                                             |
| US5851675 A | 19981222 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                          |                                                                                                                                                                                                                                             |
| US5851675 A | 19950817 | LSAS | AS    | ASSIGNMENT                                                                          | PARTYTYPE : OWNER<br>OWNER : HITACHI, LTD., JAPAN<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:OYAGI, TOMOHITO;<br>NAKAGAWA, MITSUO; SAKAI,<br>JUNJI; AND OTHERS;<br>REEL/FRAME:007602/0746<br>EFFECTIVE DATE : 19950803 |
| US5851675 A | 20020530 | LSFE | +FPAY | FEE PAYMENT                                                                         | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                     |
| US5851675 A | 20060601 | LSFE | +FPAY | FEE PAYMENT                                                                         | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                     |
| US5851675 A | 20101222 | LSLE | -LAPS | LAPSE FOR FAILURE<br>TO PAY<br>MAINTENANCE FEES                                     |                                                                                                                                                                                                                                             |
| US5851675 A | 20110117 | LSLE | -PEX1 | Patent Expired Due<br>to NonPayment of<br>Maintenance Fees<br>Under 37 CFR<br>1.362 |                                                                                                                                                                                                                                             |
| US5851675 A | 20110117 | LSLE | -STCH | INFORMATION ON<br>STATUS: PATENT<br>DISCONTINUATION                                 | TEXT : PATENT EXPIRED DUE TO<br>NONPAYMENT OF MAINTENANCE<br>FEES UNDER 37 CFR 1.362                                                                                                                                                        |
| US5851675 A | 20110208 | LSLE | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE                                 | EFFECTIVE DATE : 20101222                                                                                                                                                                                                                   |
| US5851675 A | 20151222 | PEXP |       | Calculated Patent<br>Term Expiry                                                    |                                                                                                                                                                                                                                             |

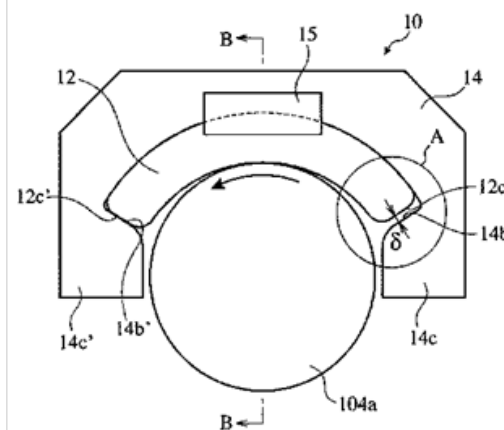
**Title:** BEARING

**Abstract:** PROBLEM TO BE SOLVED: To provide a bearing capable of maintaining high slidability even at a high line speed. SOLUTION: A bearing which rotatably supports a **roll shaft** dipped in a **molten** metal plating bath, includes a cross-sectional fan-shaped ceramic member and a metallic holder having an arcuate groove for supporting an outer peripheral surface of the ceramic member. The bearing satisfies the following conditions: a maximum clearance  $\delta$  between a circumferential end surface of the ceramic member and an opposite inclined surface of the holder is  $K=(r_1+t')\delta/t=1$  to 20 (where,  $r_1$  is a radial length of an inner peripheral surface side chamber on the circumferential end surface of the ceramic member,  $t'$  is a radial length of the circumferential end surface of the ceramic member, and  $t$  is a radial thickness of the ceramic member); a skewness  $R_{sk}$  of the inner peripheral surface of the ceramic member is  $-0.4$  to  $+0.1$ ; and a ratio of a pore area to the inner peripheral surface of the ceramic member is 2 to 6 percent, which is higher than a ratio of a pore area to the outer peripheral surface. SELECTED DRAWING: Figure 3

**Classifications:**

**International (IPC 8-9):** C23C2/00 F16C17/02 F16C33/24 F16C35/02 (Advanced/Invention)

PatBase - JP2016151048\_A2



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP2016151048 A2    | 20160822         | JP20150029314      | 20150218         |
| JP6417998 B2       | 20181107         | JP20150029314      | 20150218         |

**Priority:**

JP20150029314 20150218

**Probable Assignee:** HITACHI METALS LTD

**Assignee(s):** (std): HITACHI METALS LTD

**Inventor(s):** (std): KUMAGAI NORIO ; NAGANUMA RYO ; OGAWA EISUKE ; SHIMIZU KENICHIRO

**Agent(s):** TAKAISHI KITSUMA

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                                                         | Details                                                              |
|-----------------|---------------|-------------|-------|-------------------------------------------------------------------------------|----------------------------------------------------------------------|
| JP2016151048 A2 | 20160822      | LSPB        | +     | published / reissued                                                          |                                                                      |
| JP2016151048 A2 | 20171010      | LSSES       | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION                                   | TEXT : JAPANESE INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20171010 |
| JP2016151048 A2 | 20180717      | LSSES       | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                           | TEXT : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20180717 |
| JP2016151048 A2 | 20180905      | LSGT        | +TRDD | DECISION OF GRANT OR REJECTION WRITTEN                                        |                                                                      |
| JP2016151048 A2 | 20180911      | LSGT        | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | TEXT : JAPANESE INTERMEDIATE CODE: A01<br>EFFECTIVE DATE : 20180911  |

|                 |          |      |       |                                                                |                                                                                                                            |
|-----------------|----------|------|-------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| JP2016151048 A2 | 20181015 | LSFE | +A61  | FIRST PAYMENT OF ANNUAL FEES<br>(DURING GRANT PROCEDURE)       | TEXT : JAPANESE<br>INTERMEDIATE<br>CODE: A61<br>EFFECTIVE DATE<br>: 20180924                                               |
| JP2016151048 A2 | 20181019 | LSGT | +R150 | CERTIFICATE OF PATENT OR<br>REGISTRATION OF UTILITY MODEL      | TEXT : JAPANESE<br>INTERMEDIATE<br>CODE: R150<br>REF DOCUMENT<br>NUMBER :<br>6417998<br>COUNTRY OF<br>REF DOCUMENT :<br>JP |
| JP6417998 B2    | 20181107 | LSGT | +     | granted / extensions (spc, cpc,<br>pte)                        |                                                                                                                            |
| JP6417998 B2    | 20180913 | LSGT | +A01  | 特許査定書 (Decision of patent grant)                               |                                                                                                                            |
| JP6417998 B2    | 20180913 | LSFE | R1001 | 特許料納付書 (包括納付) (Patent fee<br>payment form (inclusive payment)) |                                                                                                                            |
| JP6417998 B2    | 20181019 | LSGT | +R150 | 特許証 (Patent certificate)                                       |                                                                                                                            |
| JP6417998 B2    | 20350218 | PEXP |       | Calculated Patent Term Expiry                                  |                                                                                                                            |

**Title:** Improvements in uniting by fusion

**Abstract:** 168,701. Percival, S., (Davis-Bournonville Co.). June 18, 1920. Uniting by fusion.-A machine for closing a seam or the equivalent by fusion uniting has means for feeding the work relatively to the blowpipe at a constant speed, and means for producing a dwell at the commencement of the work and for gradually raising the blowpipe at the end thereof. The blowpipe may be temporarily raised when acting on parts of the joint of relatively low conductivity to avoid burning the metal. Articles are fed by hand or automatically to a guide 4 and are positioned by an end stop 5 carried by a slide operated by an arm 10 on the shaft of a feedroller under the control of a weight 11. Gapped feed-rolls 36, driven through worm gearing by adjustable friction gearing 44, have their operative peripheries formed by adjustable segments 33, 34, and the stop 5 advances the work to be forwarded by the segments 33 to position the front of the joint under the blowpipe flame. The gap 35 causes a dwell sufficient for the initial heating, and the feed is continued by the segments 34 until rolls 39 engage the work and feed it completely through the machine. Cover strips 17 prevent the work from rising during the uniting. One of each pair of feed-rolls is mounted on a spring-pressed slide, the drive being through a pin and arm clutch to permit this motion. A cam 30 on the feed-roll shaft carrying the arm 10 has depressions 70 that act through a bell-crank 28 linked to an arm 23 carrying the blowpipe to raise the flame slightly while uniting in the vicinity of the holes c. A deeper depression 71 raises the flame with an accelerating motion as the end of the joint is reached. The blowpipe is attached to the arm 23 by a sleeve in which it is longitudinally adjustable.

**Classifications:**

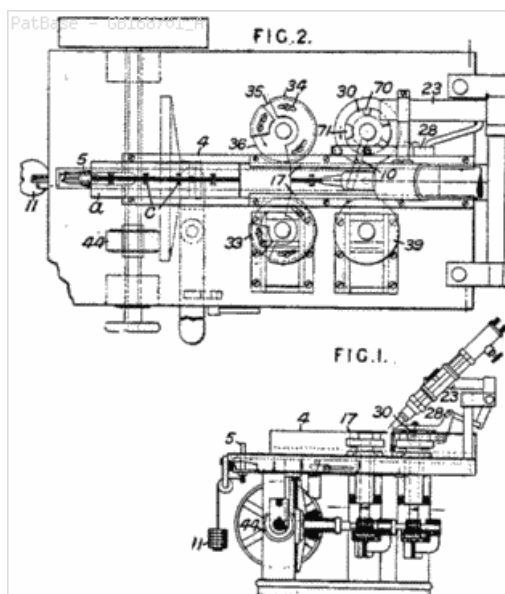
**International (IPC 8-9):** B23K5/06 (Advanced/Invention);

B23K5/00 (Core/Invention)

**International (IPC 1-7):** B23K37/00

**CPC:** B23K5/06

**European:** B23K5/06



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| GB168701 A         | 19210915         | GB19200016583      | 19200618         |

**Priority:**

GB19200016583 19200618

**Probable Assignee:** DAVIS BOURNONVILLE CO

**Assignee(s):** (std): DAVIS BOURNONVILLE CO

**Assignee(s):** THE DAVIS BOURNONVILLE COMPANY

**Legal status (INPADOC)**

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| Patent     | Date recorded | Event group | Code | Event                                | Details |
|------------|---------------|-------------|------|--------------------------------------|---------|
| GB168701 A | 19210915      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| GB168701 A | 19400618      | PEXP        |      | Calculated Patent Term Expiry        |         |

**Title:** PRODUCTION OF STRIP STOCK FROM POLYHEXAMETHYLENE ADIPAMIDE

**Abstract:** (Claim 1) 1. ][Aquid may be introduced into the ves\_el 7 th'rough the inlet connection 8, which may advantageously be valved. A frame f 0 is mounted at the, upper edge of the v6s\_el 7 and serves as a support for the pair of forming rolls 1.1-12 which are fixed on shafts ,1,3- 14.. The mounting of the rolls themselves, as illustrated herein conforms with that more fully disclosed and claimed in copending application of Robert C. Rahm, Serial No. 39,954, filed signed to the assignee of the present apphication. The adjustment And drive mechanism associated with the r6lls also coiif6rms with the disclosure Of saici COPending application and since the present, invention is not concerned with the arrangemeiit o,f, the\_6 parts per se, they need not be described in detail herein. Briefly, however, it is noted that th6 rolls are adapted to be driven from a power sh6ft carrying gears 16-17 which mesh with gears 18- 1 9 fixed on shafts 0-2 1, the latter . shafts catrying worms, such as indicated at 2 2 and 2 3 which mesh with worm wheels such as shown in Figure 3 at 24 and 25, \_tj\_e e worm wheels b S eiig. fixed.t\_o the roll mountof the properties of the fo,rmed strip may thereby 4o July 21, 1948,. issued as U. S. Patent No. 2,627,,085 be varied and accurately controlled at will. \_ For on February 3, 1953, which application. is as- ing shafts 13 and 14. The roll I I is adjustable with relation to the roll 12, so as to vary the spacing between the rolls by means of an adjustable support for shaft 13 including traveling blocks 26 associated with manually adjustable screws According to z tile invention, a serew extruder is\_ preferably employed for melting the polyamide being used and for feeding the **molten** polyamide, to tie entralice nip of the forming rolls. The de- r'ff tails of construction of the extruder di\_v'i'ce- itself, need not be considered herein but it. may. be noted; that this device has a hopper 30 adapted to receive the polyamide in granutar f-orm The.POIYamide is fed f ror-q this hopper fnto, the\_ bore- of' f6 the extruder proper indicated at 3 1, in which a screw advances the material\_' (toward, the lbft, when viewed as in Figure 1). The material\_ is heated and melted by heater elements indicated' in outline at 32 and i-S delivered in **molten** condi- tion thtb-L\_gh the nozzle a-3- which has, its delivery opening close to the entrance- nip between t- ,he rolls I 1- 1

**Classifications:**

**International (IPC 8-9):** B29C33/04 B29C43/24

B29C43/52 (Advanced/Invention);

B29C47/00 (Advanced/Non-invention);

B29C33/04 B29C43/24 B29C43/52 (Core/Invention);

B29C47/00 (Core/Non-invention)

**International (IPC 1-7):** B29C3/00 B29D7/14

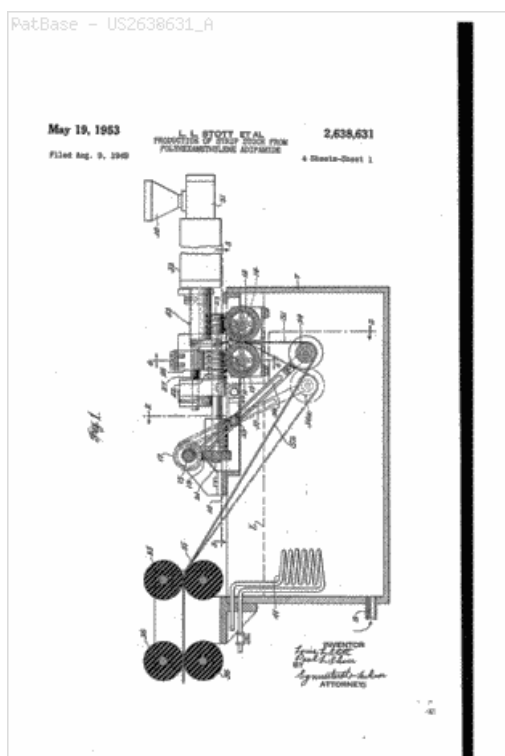
**CPC:** B29C43/24 B29C33/044 B29C43/52 B29K2077/00

B29L2007/007 B29C48/00 B29C48/08

**European:** B29C33/04B B29C43/24 B29C43/52 L29C47/00

L29K77/00 L29L7/00F

**US:** 264/175



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2638631 A        | 19530519         | US19490109336      | 19490809         |

**Priority:**

US19490109336 19490809

**Probable Assignee:**

POLYMER CORP

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

POLYMER CORP

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

STOTT LOUIS L ; SHURR PAUL L

**Legal status (INPADOC)**

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| Patent      | Date recorded | Event group | Code | Event                                | Details |
|-------------|---------------|-------------|------|--------------------------------------|---------|
| US2638631 A | 19530519      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| US2638631 A | 19700519      | PEXP        |      | Calculated Patent Term Expiry        |         |

**Title:** ROTATING HEAT SEALING HEAD WITH COOLING MEANS

**Abstract:** ABSTRACT OF THE DISCLOSURE

A continuously operated wrapping machine which encloses spaced articles in thermoplastic material is provided with a liquid cooled mounting shaft having a constantly energized rotary sealing (and cutting) bar operating through a radially apertured, liquid cooled gripper element in order to minimize heat transfer from the sealing bar to adjacent parts. Because the sealing bar is thus isolated, relatively high operating temperatures and, correspondingly, minimal time periods for sealing and cutting can be used to achieve more rapid than usual operating speeds. B

**Classifications:**

**International (IPC 8-9):** B29C65/00 B29C65/18 B29C65/74

B29C65/78 B65B51/30 (Advanced/Invention);

B29C65/00 B29C65/18 B29C65/74 B29C65/78

B65B51/26 (Core/Invention)

**International (IPC 1-7):** B29C27/00 B29C27/02 B29C27/06 B30B15/34 B32B31/18 B32B31/20 B65B51/30 B65B7/00 B65B9/12

**CPC:** B29C65/18 B29C65/743 B29C65/7841 B29C66/0044

B29C66/00441 B29C66/1122 B29C66/4312 B29C66/8122

B29C66/81457 B29C66/81815 B29C66/8226 B29C66/83543

B65B51/306 B29C66/81811 B29C66/81427 B29C66/849

B29C66/81417 B29C66/8161 Y10T156/1054 Y10T156/1313

B29C66/71 B29C65/305 B29C66/8221 B29C66/8224 B29C66/8227

**European:** B29C65/18 B29C65/743 B29C65/74D B29C65/78F

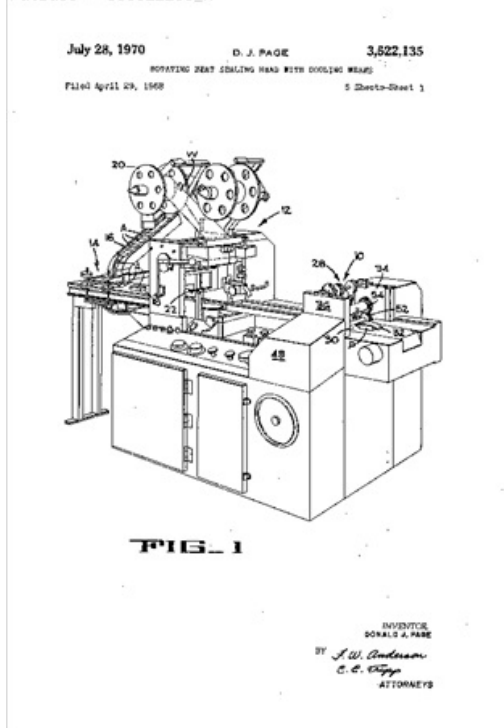
B29C66/00441 B29C66/1122 B29C66/40 B29C66/4312 B29C66/80

B29C66/81457 B29C66/81815 B29C66/8226 B29C66/83543

B65B51/30C L29C66/0044 L29C66/8122 L29C66/9241

**US:** 156/251 156/498 156/515 156/583 156/583.4 53/550

PatBase - US3522135\_A



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CH515107 A         | 19711115         | CH19690006549      | 19690429         |
| DE1921817 A1       | 19691127         | DE19691921817      | 19690429         |
| FR2007160 A1       | 19700102         | FR19690011446      | 19690414         |
| GB1262901 A        | 19720209         | GB19690020905      | 19690424         |
| US3522135 A        | 19700728         | US19680724834      | 19680429         |

**Priority:**

US19680724834 19680429

**Probable Assignee:** FMC CORP

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

**Assignee(s):** F M C CORP

**Inventor(s):** (std): PAGE DONALD J ; PAGE DONALD JOSEPH ; JOSEPH PAGE DONALD ; DONALD JOSEPH PAGE

**Inventor(s):** DONALD J PAGE

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code  | Event                                            | Details |
|--------------|---------------|-------------|-------|--------------------------------------------------|---------|
| CH515107 A   | 19711115      | LSGT        | +     | granted / extensions (spc, cpc, pte)             |         |
| CH515107 A   | 19771130      | LSLE        | -PL   | PATENT CEASED                                    |         |
| CH515107 A   | 19890429      | PEXP        |       | Calculated Patent Term Expiry                    |         |
| DE1921817 A1 | 19691127      | LSPB        | +     | published / reissued                             |         |
| FR2007160 A1 | 19700102      | LSPB        | +     | published / reissued                             |         |
| FR2007160 A1 | 19720630      | LSLE        | -ST   | NOTIFICATION OF LAPSE                            |         |
| GB1262901 A  | 19720209      | LSGT        | +     | granted / extensions (spc, cpc, pte)             |         |
| GB1262901 A  | 19720621      | LSGT        | +PS   | PATENT SEALED                                    |         |
| GB1262901 A  | 19771123      | LSLE        | -PLNP | PATENT LAPSED THROUGH NONPAYMENT OF RENEWAL FEES |         |
| GB1262901 A  | 19890424      | PEXP        |       | Calculated Patent Term Expiry                    |         |
| US3522135 A  | 19700728      | LSGT        | +     | granted / extensions (spc, cpc, pte)             |         |



**Title:** HEAT TREATING ROLL

**Abstract:** A heat treatment roll 2 is provided for continuously cooling or heating a treated object such as a resin sheet 5, which is used in an extrusion molded sheet manufacturing apparatus or the like. The heating roll 2 includes a hollow roll body 11 formed with many circular through holes 11a in the roll axis direction at a fixed close pitch on the same radius close to the cylindrical surface, wherein roll body 11 is formed by calculating the space between the circular holes 11a from the cylindrical surface to give the highest heat conduction efficiency with respect to the cylindrical surface and the lowest unevenness of temperature in the circumferential direction; a pair of side plates 12 and 13 which are fixedly provided on both end faces of the roll body 11 so as to be aligned with the roll body 11 and are provided with radial heating medium passages communicating with the circular through holes 11a in the cylindrical surface of the roll body 11; and a pair of rotating support shafts 12a and 13a extending on the same centerline on both sides of the heat treatment roll, each of which is fixedly provided integrally with one of the side plates, and has a heating medium passage communicating with the radial heating medium passages of the side plate in the axis center. Thereby, a cooling medium or a heating medium can be caused to flow from the heating medium passage in one rotating support shaft to the circular through holes in the roll body, and discharged from the heating medium passage in the other rotating support shaft, whereby a treated object such as the resin sheet 5 is cooled or heated.

**Classifications:****International (ipc 8-9):** B29C43/46 B29C43/52 B29C47/88

F16C13/00 (Advanced/Invention);

B29C35/02 B29C35/04 B29C35/16 B29C55/12

B29L7/00 (Advanced/Non-invention);

B29C43/44 B29C43/52 B29C47/88 F16C13/00 (Core/Invention);

B29C35/00 B29C35/02 B29C35/04 B29C55/12 (Core/Non-invention)

**International (ipc 1-7):** A01J21/00 A01J25/12 A21C1/00 A21C11/00

A21C3/02 A23G1/00 A23G1/20 A23G3/00 A23P1/00 B28B11/00

B28B17/02 B28B3/12 B28B5/00 B28C1/00 B29B13/00 B29C43/46

B29C43/52 B29C47/88 B29D1/00 B29L7/00 B32B31/14 F16C13/00

F24H3/00 F25B29/00 F28D11/00 F28F5/00

**CPC:** B29C48/08 B29C48/914 B29C43/52 B29C35/04 B29C35/16

B29C43/46 B29C55/12

**European:** B29C43/46 B29C43/52 B29C47/88B B29C47/88C4B

L29C35/04 L29C35/16 L29C55/12

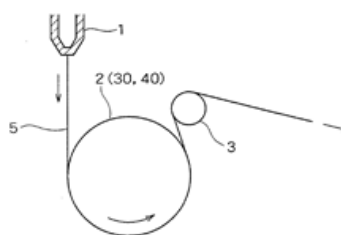
**US:** 165/47 165/47S 165/48.1 165/48.100S 165/86 165/86S 425/509

425/509P

PatBase - US2004071812\_AA

Patent Application Publication Apr. 15, 2004 Sheet 1 of 8 US 2004/071812 A1

FIG. 1

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN100429412 C      | 20081029         | CN20028001566      | 20020517         |
| CN1462347 A        | 20031217         | CN20028001566      | 20020517         |
| EP1302682 A1       | 20030416         | EP20020771723      | 20020517         |
| EP1302682 A4       | 20061018         | EP20020771723      | 20020517         |
| JP2002339950 A2    | 20021127         | JP20010148542      | 20010518         |
| US2004071812 AA    | 20040415         | US20030344366      | 20031002         |
| WO20095249 A1      | 20021128         | WO2002JP04810      | 20020517         |

**Priority:**

JP20010148542 20010518 WO2002JP04810 20020517

**Probable Assignee:** MITSUBISHI HEAVY IND LTD**Assignee(s):** (std): GOTO TAKUYA ; HASEGAWA NORITAKA ; HASHIMOTO RITSUO ; JAPAN STEEL WORKS LTD ; KOMETANI HIDEO ; MITSUBISHI HEAVY IND LTD ; TSUJI HIROSHI ; YOSHIZAWA MASAHIRO**Assignee(s):** MITSUBISHI HEAVY INDUSTRIES LTD ; MITSUBISHI HEAVY IND**Inventor(s):** (std): GOTO TAKUYA ; HASEGAWA NORITAKA ; HASHIMOTO RITSUO ; HIROSHI TSUJI ; KOMETANI HIDEO ; MASAHIRO YOSHIZAWA ; TAKUYA GOTO ; TSUJI HIROSHI ; YONETANI HIDEO ; YOSHIZAWA MASAHIRO**Designated states:** AT CN DE FR IT US**Legal status (INPADOC)**[View legal status timeline](#)

| Patent        | Date recorded | Event group | Code | Event                                | Details |
|---------------|---------------|-------------|------|--------------------------------------|---------|
| CN100429412 C | 20081029      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| CN100429412 C | 20081029      | LSGT        | +C14 | GRANT OF PATENT OR UTILITY MODEL     |         |

|                 |          |      |       |                                                     |                                                                                                                                                                                                                                                          |
|-----------------|----------|------|-------|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CN100429412 C   | 20110720 | LSLE | -C17  | CESSATION OF PATENT RIGHT                           |                                                                                                                                                                                                                                                          |
| CN100429412 C   | 20220517 | PEXP |       | Calculated Patent Term Expiry                       |                                                                                                                                                                                                                                                          |
| CN1462347 A     | 20031217 | LSPB | +     | published / reissued                                |                                                                                                                                                                                                                                                          |
| CN1462347 A     | 20031217 | LSPB | +C06  | PUBLICATION                                         |                                                                                                                                                                                                                                                          |
| EP1302682 A1    | 20030416 | LSPB | +     | published / reissued                                |                                                                                                                                                                                                                                                          |
| EP1302682 A1    | 20030416 | LSES | +17P  | REQUEST FOR EXAMINATION FILED                       | EFFECTIVE DATE : 20030211                                                                                                                                                                                                                                |
| EP1302682 A4    | 20061018 | LSES | +A4   | SUPPLEMENTARY SEARCH REPORT DRAWN UP AND DESPATCHED | EFFECTIVE DATE : 20060918                                                                                                                                                                                                                                |
| EP1302682 A4    | 20070124 | LSES | +17Q  | FIRST EXAMINATION REPORT DESPATCHED                 | EFFECTIVE DATE : 20061228                                                                                                                                                                                                                                |
| EP1302682 A4    | 20100630 | LSDW | -18D  | APPLICATION DEEMED TO BE WITHDRAWN                  | EFFECTIVE DATE : 20100107                                                                                                                                                                                                                                |
| JP2002339950 A2 | 20021127 | LSPB | +     | published / reissued                                |                                                                                                                                                                                                                                                          |
| JP2002339950 A2 | 20070320 | LSAS | A711  | NOTIFICATION OF CHANGE IN APPLICANT                 | TEXT : JAPANESE INTERMEDIATE CODE: A711<br>EFFECTIVE DATE : 20070319                                                                                                                                                                                     |
| US2004071812 AA | 20040415 | LSPB | +     | published / reissued                                |                                                                                                                                                                                                                                                          |
| US2004071812 AA | 20031002 | LSAS | AS    | ASSIGNMENT                                          | PARTYTYPE : OWNER<br>OWNER : MITSUBISHI HEAVY INDUSTRIES, LTD., JAPAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:TSUJI, HIROSHI; GOTO, TAKUYA; YOSHIZAWA, MASAHIRO; AND OTHERS;<br>REEL/FRAME:014729/0417<br>EFFECTIVE DATE : 20030407 |
| US2004071812 AA | 20061030 | LSWD | -ABD3 | Abandoned -- Failure to Respond to an Office Action |                                                                                                                                                                                                                                                          |
| WO02095249 A1   | 20021128 | LSPB | +     | published / reissued                                |                                                                                                                                                                                                                                                          |
| WO02095249 A1   | 20030107 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE         | REF DOCUMENT NUMBER : 028015665<br>COUNTRY OF REF DOCUMENT : CN                                                                                                                                                                                          |
| WO02095249 A1   | 20030211 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE         | REF DOCUMENT NUMBER : 2002771723<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                                                         |
| WO02095249 A1   | 20030416 | LSPB | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE      | REF DOCUMENT NUMBER : 2002771723<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                                                                         |
| WO02095249 A1   | 20031002 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE         | REF DOCUMENT NUMBER : 10344366<br>COUNTRY OF REF DOCUMENT : US                                                                                                                                                                                           |

**Title:** MAGNETIC SORTING APPARATUS, MAGNETIC SORTING METHOD, AND METHOD FOR MANUFACTURING IRON SOURCE

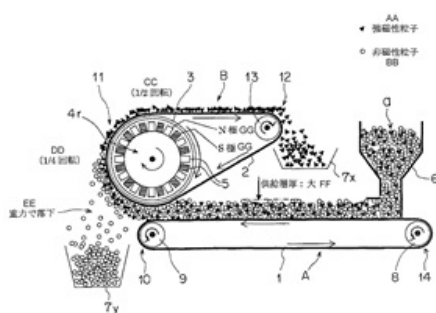
**Abstract:** Provided are a magnetic sorting apparatus and a magnetic sorting method for efficiently separating ferromagnetic particles from a powder-particle material containing the ferromagnetic particles, and performing magnetic sorting at low cost without requiring complex steps, wastewater treatment, or the like. This magnetic sorting apparatus has: a conveyor belt for transporting a powder-particle material containing ferromagnetic particles; a rotatable hollow belt-guide roll wrapped in the conveyor belt around a portion of the outer periphery thereof; and a magnetic-field application means positioned on the inner side of the belt-guide roll, the magnetic-field application means having a plurality of magnets on the inner side of the belt-guide roll, and the ferromagnetic particles being separated in the magnetic field generated by the magnetic-field application means. The magnets are arranged so that the magnetic poles adjoining in the peripheral direction of the belt-guide roll have differing magnetism, and so that the magnetic poles adjoining in the width direction of the belt-guide roll have the same polarity.

**Classifications:**

**International (IPC 8-9):** B03C1/00 B03C1/18 (Advanced/Invention)

**CPC:** B03C1/18 B03C2201/20 B03C1/0332

PatBase - WO14061256\_A1



AA... FERROMAGNETIC PARTICLE  
BB... NONMAGNETIC PARTICLE  
CC... (1/2 ROTATION)  
DD... (1/4 ROTATION)  
EE... FALLS DUE TO GRAVITY  
FF... SUPPLY LAYER THICKNESS: HIGH  
GG... POLE

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN104736249 A      | 20150624         | CN201380054216     | 20131011         |
| EP2910309 A1       | 20150826         | EP20130846992      | 20131011         |
| EP2910309 A4       | 20160120         | EP20130846992      | 20131011         |
| IN00483MN2015 A    | 20150911         | IN2015MN00483      | 20150305         |
| JP2014061256 A1    | 20160905         | JP20140541943T     | 20131011         |
| JP5773089 B1       | 20150902         | JP20140541943T     | 20131011         |
| KR20150058475 A    | 20150528         | KR20157010330      | 20131011         |
| KR20180035951 A    | 20180406         | KR20187009294      | 20131011         |
| WO14061256 A1      | 20140424         | WO2013JP06109      | 20131011         |

**Priority:**

JP20120229210 20121016 JP20120229214 20121016 WO2013JP06109 20131011  
JP20140541943 20131011

**Probable Assignee:** JFE HOLDINGS INC

**Assignee(s):** (std): JFE HOLDINGS INC ; JFE STEEL CORP ; KAWASAKI STEEL CO

**Inventor(s):** (std): ISHIDA KYOHEI ; IMANISHI DAISUKE ; ENOEDA SEIJI ; NISHINA YOSHIKI

**Agent(s):** GRUENECKER PATENT U RECHTSANWALTE PARTG MBB; KUMASAKA AKIRA 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 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 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                   |
|-----------------|---------------|-------------|------|-----------------------------------------------------------------|---------------------------|
| CN104736249 A   | 20150624      | LSPB        | +    | published / reissued                                            |                           |
| CN104736249 A   | 20150624      | LSPB        | +C06 | PUBLICATION                                                     |                           |
| EP2910309 A1    | 20150826      | LSPB        | +    | published / reissued                                            |                           |
| EP2910309 A1    | 20150826      | LSSES       | +17P | REQUEST FOR EXAMINATION FILED                                   | EFFECTIVE DATE : 20150518 |
| EP2910309 A4    | 20160120      | LSSES       | +RA4 | SUPPLEMENTARY SEARCH REPORT DRAWN UP AND DESPATCHED (CORRECTED) | EFFECTIVE DATE : 20151221 |
| IN00483MN2015 A | 20150911      | LSPB        | +    | published / reissued                                            |                           |
| JP2014061256 A1 | 20160905      | LSPB        | +    | published / reissued                                            |                           |
| JP5773089 B1    | 20150902      | LSGT        | +    | granted / extensions (spc, cpc, pte)                            |                           |

|                 |          |       |       |                                                             |                                                                                                                             |
|-----------------|----------|-------|-------|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| JP5773089 B1    | 20150604 | LSGT  | +A01  | 特許査定書 (Decision of patent grant)                            |                                                                                                                             |
| JP5773089 B1    | 20150604 | LSFE  | R1001 | 特許料納付書 (包括納付) (Patent fee payment form (inclusive payment)) |                                                                                                                             |
| JP5773089 B1    | 20150710 | LSGT  | +R150 | 特許証 (Patent certificate)                                    |                                                                                                                             |
| JP5773089 B1    | 20180531 | LSFE  | R20   | 特許料納付書 (Patent fee payment form)                            |                                                                                                                             |
| JP5773089 B1    | 20180605 | LSFE  | R2501 | 年金領収書 (一括) (Pension receipt (bulk))                         |                                                                                                                             |
| JP5773089 B1    | 20190530 | LSFE  | R20   | 特許料納付書 (Patent fee payment form)                            |                                                                                                                             |
| JP5773089 B1    | 20190604 | LSFE  | R2501 | 年金領収書 (一括) (Pension receipt (bulk))                         |                                                                                                                             |
| JP5773089 B1    | 20331011 | PEXP  |       | Calculated Patent Term Expiry                               |                                                                                                                             |
| KR20150058475 A | 20150528 | LSPB  | +     | published / reissued                                        |                                                                                                                             |
| KR20150058475 A | 20150422 | LSSES | A201  | REQUEST FOR EXAMINATION                                     |                                                                                                                             |
| KR20150058475 A | 20150422 | LSRE  | AMND  | AMENDMENT                                                   |                                                                                                                             |
| KR20150058475 A | 20161129 | LSSES | -E902 | NOTIFICATION OF REASON FOR REFUSAL                          |                                                                                                                             |
| KR20150058475 A | 20170327 | LSRE  | AMND  | AMENDMENT                                                   |                                                                                                                             |
| KR20150058475 A | 20171129 | LSRE  | AMND  | AMENDMENT                                                   |                                                                                                                             |
| KR20180035951 A | 20180406 | LSPB  | +     | published / reissued                                        |                                                                                                                             |
| KR20180035951 A | 20181005 | LSSES | A201  | REQUEST FOR EXAMINATION                                     |                                                                                                                             |
| KR20180035951 A | 20181224 | LSSES | -E902 | NOTIFICATION OF REASON FOR REFUSAL                          |                                                                                                                             |
| KR20180035951 A | 20190703 | LSGT  | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT           |                                                                                                                             |
| WO14061256 A1   | 20140424 | LSPB  | +     | published / reissued                                        |                                                                                                                             |
| WO14061256 A1   | 20140821 | LSNP  | ENP   | ENTRY INTO THE NATIONAL PHASE IN:                           | REF DOCUMENT NUMBER : 2014541943<br>COUNTRY OF REF DOCUMENT : JP<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) :  |
| WO14061256 A1   | 20150416 | LSNE  | NENP  | NON-ENTRY INTO THE NATIONAL PHASE IN:                       | REF COUNTRY CODE : DE                                                                                                       |
| WO14061256 A1   | 20150422 | LSNP  | ENP   | ENTRY INTO THE NATIONAL PHASE IN:                           | REF DOCUMENT NUMBER : 20157010330<br>COUNTRY OF REF DOCUMENT : KR<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) : |
| WO14061256 A1   | 20150518 | LSNP  | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                 | REF DOCUMENT NUMBER : 2013846992<br>COUNTRY OF REF DOCUMENT : EP                                                            |

**Title:** Apparatus for treating metal

**Abstract:** ABSTRACT OF THE DISCLOSURE

A rolling mill adapted to perform drastic reduction of metal work of 50% or more in a single pass from ingot and billet sizes which includes a nest of four work rolls having axes at right angles to each other and which form a fully confined pass for the work. Each roll is motor-driven and is supported in its own housing and an adjacent housing. The mill also contains removable capping means for each roll which maintain the roll shafts in the mill housing and can be removed for roll replacement.

**Classifications:**

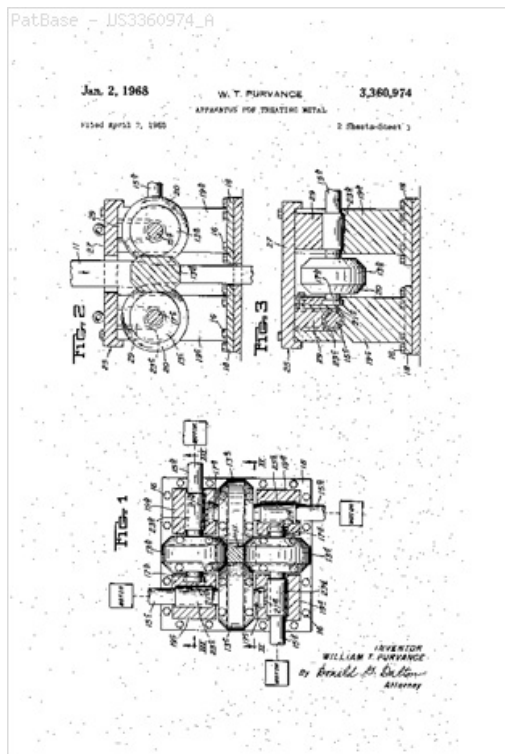
**International (IPC 8-9):** B21B13/10 (Advanced/Invention);  
B21B13/00 (Core/Invention)

**International (IPC 1-7):** B21B1/08 B21B1/10 B21B13/10 B21B31/02

**CPC:** B21B13/103 B21B2201/18

**European:** B21B13/10B L21B201/18

**US:** 72/224



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT278689 B         | 19700210         | AT19660003284      | 19660406         |
| BE679007 A         | 19661004         |                    | 19660404         |
| DE1527730 A1       | 19700219         | DE19661527730      | 19660329         |
| ES324972 A1        | 19661216         | ES19660324972      | 19660331         |
| FR1474631 A        | 19670324         | FR19660056610      | 19660406         |
| GB1138857 A        | 19690101         | GB19660013885      | 19660329         |
| NL6604761 A        | 19661010         | NL19660004761      | 19660407         |
| US3360974 A        | 19680102         | US19650446223      | 19650407         |

**Priority:**

US19650446223 19650407 FR19660056610 19660406

**Probable Assignee:** UNITED STATES STEEL CORP

**Assignee(s):** (std): UNITED STATES STEEL CORP

**Inventor(s):** (std): TRUXTON PURVANCE WILLIAM ; PURVANCE WILLIAM T

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code | Event                                | Details |
|--------------|---------------|-------------|------|--------------------------------------|---------|
| AT278689 B   | 19700210      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| AT278689 B   | 19860406      | PEXP        |      | Calculated Patent Term Expiry        |         |
| BE679007 A   | 19661004      | LSPB        | +    | published / reissued                 |         |
| BE679007 A   | 19860404      | PEXP        |      | Calculated Patent Term Expiry        |         |
| DE1527730 A1 | 19700219      | LSPB        | +    | published / reissued                 |         |
| ES324972 A1  | 19661216      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| FR1474631 A  | 19670324      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| FR1474631 A  | 19860406      | PEXP        |      | Calculated Patent Term Expiry        |         |
| GB1138857 A  | 19690101      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| GB1138857 A  | 19860329      | PEXP        |      | Calculated Patent Term Expiry        |         |
| NL6604761 A  | 19661010      | LSPB        | +    | published / reissued                 |         |



**Title:** VERFAHREN ZUR BEHANDLUNG EBENER FASERIGER BEHAELTERROHLINGE UND GERAET ZUR DURCHFUEHRUNG DES VERFAHRENS METHOD FOR THE TREATMENT OF PLANE fibrous BEHAELTERROHLINGE AND DEVICE FOR IMPLEMENTING SAID METHOD (Machine translation)

**Abstract:** Source: DE1561533A1 [DE] (Claim 1) Patentansprueche 1. Geraet zur Behandlung ebener faseriger Behaelterrohlinge mit einem Zufuehrmagazin, das einen Stapel von Behaelterroh lingen aufnimmt, und einer Vorrichtung zum aufeinanderfolgen- den Abziehen einzelner Rohlinge von einem Ende des Stapels und zum Weiterbewegen der restlichen Rohlinge in dem Stapel in Zufuehrrichtung, g e k e n n z e i c h n e t d u r c h die Kombination von Vorrichtungen (1E) zum Vorwaermen ge wisser Randabschnitte (F) der Hohlinge (E) waehrend deren Vorwaertsbewegung durch das Zufuehrmagazin, um die Rand abschnitte fuer ein Impraeagniermittel aufnahmefaeig zu machen, und Vorrichtungen (9), die unmittelbar nach Beendigung der 1, ge k e n n z e i c h n e t d u r c h Vorrichtungen (23 usw.), die die Vorheiz- und Impraeagniervorrichtungen ausser Betrieb setzen, wenn das Zufuehrgeraet fuer Rohlinge angehalten wird. 3.

**Machine translation:** (Claim 1) claims first Device for the treatment of plane fibrous Behaelterrohlinge with a feeding magazine, which holds a stack lingen of Behaelterroh, and a device for consecutive to the removal of individual blanks from one end of the stack and to continue moving the remaining blanks in the stack in the feed, characterized by the combination of devices (1U) for preheating GE Wissner edge sections (F) of the hollow rings (E) during its movement forward by the feed magazine to the boundary for sections one impregnating making capacity, and equipment (9), immediately after the 1, g E characterized by means (23, etc.) that set the preheat and impregnating out of service when the feeder is stopped for blanks. Third

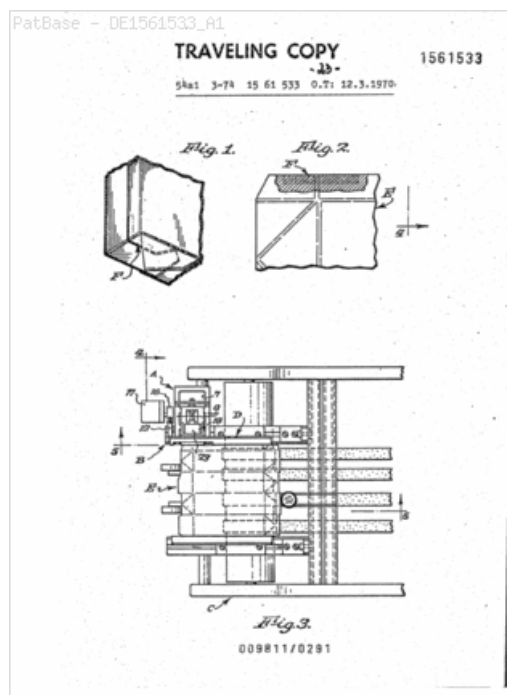
#### Classifications:

**International (IPC 8-9):** B31B1/74 B31B50/00 (Advanced/Invention); B31B1/74 (Core/Invention)

**International (IPC 1-7):** B31B3/60

**CPC:** B31B50/00 B31B50/743

**European:** B31B1/74 L31B201/62A



#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE1561533 A1       | 19700312         | DE19671561533      | 19671102         |

#### Priority:

DE1967J034942 19671102

**Probable Assignee:** INT PAPER CO

**Assignee(s):** (std): INT PAPER CO

**Assignee(s):** INTERNATIONAL PAPER COMPANY

**Inventor(s):** (std): NORBERT ADEMINO JAMES ; JONES CROTHERS JUN WILLIAM ; EDWARD SCHWENK WILLIAM ; BERNARD MOORS HAROLD

**Inventor(s):** JONES CROTHERS JUN

#### Legal status (INPADOC)

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| Patent       | Date recorded | Event group | Code | Event                | Details |
|--------------|---------------|-------------|------|----------------------|---------|
| DE1561533 A1 | 19700312      | LSPB        | +    | published / reissued |         |

**Title:** Method for preparation of printing plate by electrophotographic process

**Abstract:** A method for preparation of a printing plate by an electrophotographic process comprising providing a peelable transfer layer (T) containing a resin (A) capable of being removed upon a chemical reaction treatment on an electrophotographic light-sensitive element, forming a toner image on the transfer layer by an electrophotographic process, providing an adhesive layer (M) containing a thermoplastic resin (B) only on the toner image, transferring the toner image together with the transfer layer (T) and the adhesive layer (M) from the electrophotographic light-sensitive element to a primary receptor, transferring the toner image together with the transfer layer (T) and the adhesive layer (M) from the primary receptor to a receiving material having a surface capable of providing a hydrophilic surface suitable for lithographic printing at the time of printing, and then removing the transfer layer (T) in the non-image portion on the receiving material by the chemical reaction treatment. According to the method of the present invention, printing plates which produce prints of good image qualities having a large proportion of image areas can be continuously obtained in a stable manner for a long period of time even when a thickness of the transfer layer is reduced or the transfer is conducted under conditions of low temperature, low pressure and high speed irrespective of the kind of toner employed.

**Classifications:**

**International (IPC 8-9):** G03G13/16 G03G13/26

G03G13/28 (Advanced/Invention);

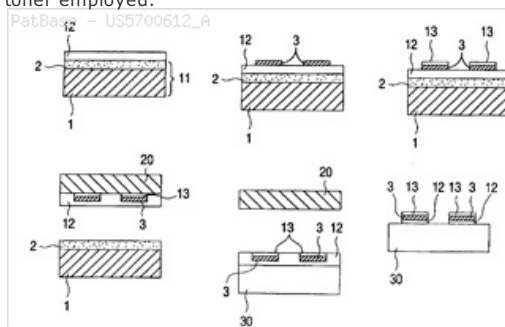
G03G13/14 G03G13/26 G03G13/28 (Core/Invention)

**International (IPC 1-7):** G03G13/16 G03G13/26 G03G13/28

**CPC:** G03G13/26 G03G13/283

**European:** G03G13/26 G03G13/28B

**US:** 430/126 430/49 430/49.31



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| GB2302063 A1       | 19970108         | GB19960012258      | 19960612         |
| GB2302063 B2       | 19990203         | GB19960012258      | 19960612         |
| GB9612258 A0       | 19960814         | GB19960012258      | 19960612         |
| JP9062038 A2       | 19970307         | JP19960151364      | 19960612         |
| US5700612 A        | 19971223         | US19960661723      | 19960611         |

**Priority:**

JP19950144885 19950612 JP19960151364 19960612

**Probable Assignee:** FUJIFILM HOLDINGS CORP

**Assignee(s):** (std): FUJI PHOTO FILM CO LTD

**Assignee(s):** FUJIFILM CORP ; FUJIFILM HOLDINGS CORP

**Inventor(s):** (std): NAKAZAWA YUSUKE ; KATO EIICHI ; ISHII KAZUO

**Inventor(s):** EIICHI KATO ; KAZUO ISHII ; YUSUKE NAKAZAWA

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code  | Event                                            | Details                                                                                                                                                                                                                            |
|--------------|---------------|-------------|-------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB2302063 A1 | 19970108      | LSPB        | +     | published / reissued                             |                                                                                                                                                                                                                                    |
| GB2302063 B2 | 19990203      | LSGT        | +     | granted / extensions (spc, cpc, pte)             |                                                                                                                                                                                                                                    |
| GB2302063 B2 | 20130227      | LSLE        | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE | EFFECTIVE DATE : 20120612                                                                                                                                                                                                          |
| GB2302063 B2 | 20160612      | PEXP        |       | Calculated Patent Term Expiry                    |                                                                                                                                                                                                                                    |
| JP9062038 A2 | 19970307      | LSPB        | +     | published / reissued                             |                                                                                                                                                                                                                                    |
| US5700612 A  | 19971223      | LSGT        | +     | granted / extensions (spc, cpc, pte)             |                                                                                                                                                                                                                                    |
| US5700612 A  | 19960611      | LSAS        | AS    | ASSIGNMENT                                       | PARTYTYPE : OWNER<br>OWNER : FUJI PHOTO FILM CO., LTD., JAPAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:KATO, EIICHI;<br>NAKAZAWA, YUSUKE; ISHII, KAZUO;<br>REEL/FRAME:008045/0587<br>EFFECTIVE DATE : 19960605 |
| US5700612 A  | 20010531      | LSFE        | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                            |
| US5700612 A  | 20050526      | LSFE        | +FPAY | FEE PAYMENT                                      | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                            |

|             |          |      |       |                                                                                     |                                                                                                                                                                                                                                                             |
|-------------|----------|------|-------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US5700612 A | 20070215 | LSAS | AS    | ASSIGNMENT                                                                          | PARTYTYPE : OWNER<br>OWNER : FUJIFILM CORPORATION,<br>JAPAN<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:FUJIFILM HOLDINGS<br>CORPORATION (FORMERLY FUJI<br>PHOTO FILM CO., LTD.);<br>REEL/FRAME:018904/0001<br>EFFECTIVE DATE : 20070130 |
| US5700612 A | 20070215 | LSAS | AS    | ASSIGNMENT                                                                          | PARTYTYPE : OWNER<br>OWNER : FUJIFILM<br>CORPORATION,JAPAN<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:FUJIFILM HOLDINGS<br>CORPORATION (FORMERLY FUJI<br>PHOTO FILM CO., LTD.);<br>REEL/FRAME:018904/0001<br>EFFECTIVE DATE : 20070130  |
| US5700612 A | 20091223 | LSLE | -LAPS | LAPSE FOR FAILURE<br>TO PAY<br>MAINTENANCE FEES                                     |                                                                                                                                                                                                                                                             |
| US5700612 A | 20100118 | LSLE | -PEX1 | Patent Expired Due<br>to NonPayment of<br>Maintenance Fees<br>Under 37 CFR<br>1.362 |                                                                                                                                                                                                                                                             |
| US5700612 A | 20100118 | LSLE | -STCH | INFORMATION ON<br>STATUS: PATENT<br>DISCONTINUATION                                 | TEXT : PATENT EXPIRED DUE TO<br>NONPAYMENT OF MAINTENANCE FEES<br>UNDER 37 CFR 1.362                                                                                                                                                                        |
| US5700612 A | 20100209 | LSLE | -FP   | EXPIRED DUE TO<br>FAILURE TO PAY<br>MAINTENANCE FEE                                 | EFFECTIVE DATE : 20091223                                                                                                                                                                                                                                   |
| US5700612 A | 20160611 | PEXP |       | Calculated Patent<br>Term Expiry                                                    |                                                                                                                                                                                                                                                             |

**Title:** COMPACTED PELLETIZED ADDITIVE BLENDS CONTAINING A POLYMER CARRIER

**Abstract:** Improved solventless processing technology for additive blends containing a polymer carrier, including those which have high level of additives, is described. High concentrations of low-melting, sticky additives lead to phase separation and extrusion instability, such that pellets cannot be formed from such additive blends by traditional extrusion process. These blends include those with a high level of active additives that have been described in the literature as Type A Superblends. Here a polymer typically acts as the carrier of the additives. The new and improved technology involves the solid state compaction processing, using a tubular die, of such impossible-to-pelletize additive blends of the Type A composition to produce commercially useful pelletized additive blends.

**Classifications:**

**International (IPC 8-9):** B29B9/08 B29C43/00 B29C43/10 C08J3/20 C08K13/02 C08K3/26 C08K5/105 C08K5/17 C08K5/524 (Advanced/Invention);

B29K105/00 B29K23/00 B29L31/00 (Advanced/Non-invention)

**CPC:** B29C43/003 C08K5/105 C08J3/203 B29C43/10 C08J2323/06 B29C2043/106 B29K2023/0633 B29K2105/0008 B29K2105/0044 B29K2105/251 B29L2031/772 C08K5/17 C08K5/524 B29B9/08 B29C43/006 C08J2423/06

**US:** 264/117 524/151

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2015057398 AA    | 20150226         | US20140469092      | 20140826         |
| US9630349 BB       | 20170425         | US20140469092      | 20140826         |

**Priority:**

US20130870150P 20130826 US20140469092 20140826

**Probable Assignee:** INGENIA POLYMERS INC

**Assignee(s):** (std): INGENIA POLYMERS INC

**Inventor(s):** (std): CHATTERJEE ANANDA M ; SUBRAHMANYAN SUMITRA

**Agent(s):** TIMOTHY M; CLARK HILL PLC

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code | Event                                                                                | Details                                                                                                                                                                                              |
|-----------------|---------------|-------------|------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2015057398 AA | 20150226      | LSPB        | +    | published / reissued                                                                 |                                                                                                                                                                                                      |
| US2015057398 AA | 20170221      | LSAS        | AS   | ASSIGNMENT                                                                           | PARTYTYPE : OWNER<br>OWNER : INGENIA POLYMERS, INC., TEXAS<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:SUBRAHMANYAN, SUMITRA;<br>REEL/FRAME:041314/0237<br>EFFECTIVE DATE : 20170125 |
| US2015057398 AA | 20170405      | LSGT        | STCF | INFORMATION ON STATUS: PATENT GRANT                                                  | TEXT : PATENTED CASE                                                                                                                                                                                 |
| US9630349 BB    | 20170425      | LSGT        | +    | granted / extensions (spc, cpc, pte)                                                 |                                                                                                                                                                                                      |
| US9630349 BB    | 20170405      | LSGT        | PAT1 | Patented Case                                                                        |                                                                                                                                                                                                      |
| US9630349 BB    | 20341030      | PEXP        |      | Calculated Patent Term Expiry (PTA 65 days and a terminal disclaimer has been filed) |                                                                                                                                                                                                      |

**Title:** APPARATUS FOR PAINT APPLICATION

**Abstract:** An apparatus for applying a paint on a road which comprises a paint supply means provided with a plurality of orifices in two rows in an opposite relation on a lower portion of said paint supply means for discharging paint, a tank provided on the top of said paint supply means for containing a paint, a pair of wire roll brushes attached to said paint supply means to rotate inwardly and disposed adjacent said orifices, and a pair of roll brush-cover members each having a sharp edge at the other end which is disposed in a position to touch the lower side of said wire roll brushes.

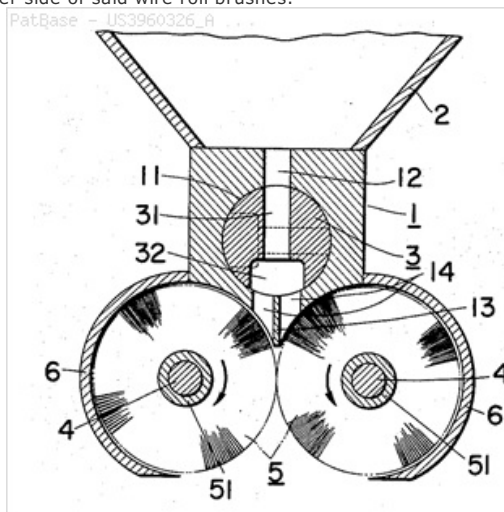
**Classifications:**

**International (IPC 8-9):** B05B3/02 B05C5/00 E01C23/16 E01C23/20 E01C23/22 E01C23/24 (Advanced/Invention); B05B3/02 B05C5/00 E01C23/00 (Core/Invention)

**International (IPC 1-7):** B05B17/00 B05B3/02 B05B3/10 B05C1/08 B05C17/00 B05C19/00 B05C5/00 B05C5/02 E01C23/16 E01F9/04  
**CPC:** Y10S118/16 B05B3/02 E01C23/22

**European:** B05B3/02 E01C23/22

**US:** 118/308 118/DIG.16 239/214



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CA1060694 A1       | 19790821         | CA19760248859      | 19760325         |
| DE2529323 A1       | 19760325         | DE19752529323      | 19750701         |
| DE2529323 B2       | 19780608         | DE19752529323      | 19750701         |
| DE2529323 C3       | 19790125         | DE19752529323      | 19750701         |
| FR2305244 A1       | 19761022         | FR19750028813      | 19750919         |
| FR2305244 B1       | 19800516         | FR19750028813      | 19750919         |
| GB1506757 A        | 19780412         | GB19750027087      | 19750626         |
| JP51034569 U1      | 19760315         | JP19740106090U     | 19740905         |
| JP51119365 U1      | 19760928         | JP19750039372U     | 19750326         |
| JP53014375 Y2      | 19780417         | JP19740106090U     | 19740905         |
| JP53045109 Y2      | 19781028         | JP19750039372U     | 19750326         |
| US3960326 A        | 19760601         | US19750538966      | 19750106         |
| US4011993 A        | 19770315         | US19750580613      | 19750527         |

**Priority:**

JP19740106090U 19740905 JP19750039372U 19750326

**Probable Assignee:** ATOM CHEM PAINT CO LTD

**Assignee(s):** (std): ATOM CHEMICAL PAINT CO LTD ; ATOM CHEM PAINT CO LTD

**Assignee(s):** ATOM CHEMICAL PAINT CO ; ATOM CHEMICAL PAINT CO LTD TOKIO ; MIZUNO MAKOTO ; NISHIUMI YOSHIO ; NAGASAKA YUKIO

**Inventor(s):** (std): NAGASAKA YUKIO ; NISHIUMI YOSHIO ; NAGASAKA YUKUO ; MIZUNO MAKOTO

**Inventor(s):** NAGASAKA YUKIO KAWAGOE SAITAMA ; NAGASAKA YUKUO KAWAGOE SAITAMA

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code  | Event                                               | Details                   |
|--------------|---------------|-------------|-------|-----------------------------------------------------|---------------------------|
| DE2529323 A1 | 19760325      | LSPB        | +     | published / reissued                                |                           |
| DE2529323 B2 | 19780608      | LSPB        | +     | published / reissued                                |                           |
| DE2529323 C3 | 19790125      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |                           |
| DE2529323 C3 | 19790125      | LSGT        | +C3   | GRANT AFTER TWO PUBLICATION STEPS (3RD PUBLICATION) |                           |
| FR2305244 A1 | 19761022      | LSPB        | +     | published / reissued                                |                           |
| FR2305244 B1 | 19800516      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |                           |
| FR2305244 B1 | 19950919      | PEXP        |       | Calculated Patent Term Expiry                       |                           |
| GB1506757 A  | 19780412      | LSGT        | +     | granted / extensions (spc, cpc, pte)                |                           |
| GB1506757 A  | 19780823      | LSGT        | +PS   | PATENT SEALED                                       |                           |
| GB1506757 A  | 19950726      | LSLE        | -PE20 | PATENT EXPIRED AFTER TERMINATION OF 20 YEARS        | EFFECTIVE DATE : 19950625 |
| GB1506757 A  | 19950626      | PEXP        |       | Calculated Patent Term Expiry                       |                           |

|               |          |      |   |                                      |
|---------------|----------|------|---|--------------------------------------|
| JP51034569 U1 | 19760315 | LSPB | + | published / reissued                 |
| JP51119365 U1 | 19760928 | LSPB | + | published / reissued                 |
| JP53014375 Y2 | 19780417 | LSPB | + | published / reissued                 |
| JP53045109 Y2 | 19781028 | LSPB | + | published / reissued                 |
| US3960326 A   | 19760601 | LSGT | + | granted / extensions (spc, cpc, pte) |
| US4011993 A   | 19770315 | LSGT | + | granted / extensions (spc, cpc, pte) |

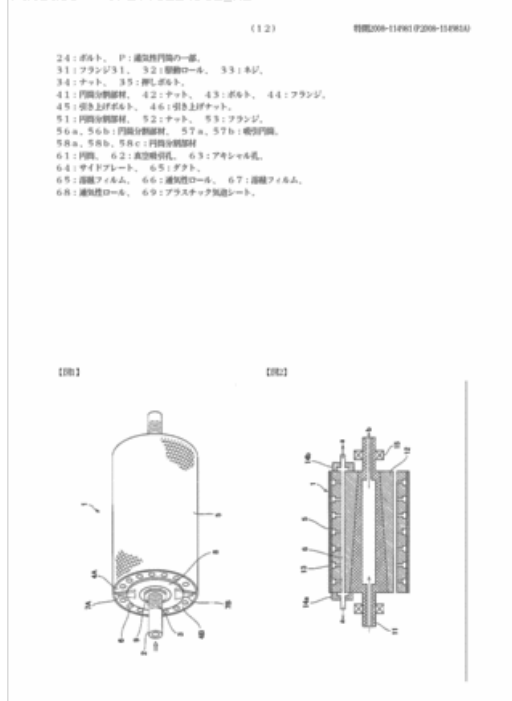
**Title:** BREATHABLE ROLL FOR CONVEYING **MOLTEN** RESIN SHEET

**Abstract:** PROBLEM TO BE SOLVED: To provide a breathable roll used for conveying a **molten** resin sheet, capable of easily replacing breathable material on a roll surface, equalizing tension of the breathable material in respective parts on a breathable roll surface, reducing cooling and stably conveying without bubble traces and wrinkles on the **molten** resin sheet. SOLUTION: The breathable roll for conveying **molten** resin sheet is provided with a drive roll, a suction cylinder which is structured so as to cover a roll surface of the drive roll, and fit in the drive roll, includes many vacuum suction holes arranged on a surface, and is divided so as to be opened from a **roll shaft** in a radiation direction, plate like cylinder dividing members having a tapered part interposed between the respective suction cylinders, a breathable cylinder provided on a cylinder surface of the suction cylinder, and a cylinder dividing member moving means structured so as to press the cylinder dividing member in an axial direction of the cylinder between the divided suction cylinders.

**Classifications:**

**International (IPC 8-9):** B65H20/12 B65H27/00 B65H5/22  
F16C13/00 (Advanced/Invention);  
B65H20/00 B65H27/00 B65H5/22 F16C13/00 (Core/Invention)

PatBase - JP2008114981\_A2



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP2008114981 A2    | 20080522         | JP20060299870      | 20061106         |
| JP4884166 B2       | 20120229         | JP20060299870      | 20061106         |

**Priority:**

JP20060299870 20061106

**Probable Assignee:**

KAWAKAMI SANGYO CO LTD

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

KAWAKAMI SANGYO CO LTD

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

KEZUKA KIYOHISA

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                       | Details                                                              |
|-----------------|---------------|-------------|-------|---------------------------------------------|----------------------------------------------------------------------|
| JP2008114981 A2 | 20080522      | LSPB        | +     | published / reissued                        |                                                                      |
| JP2008114981 A2 | 20091016      | LSSES       | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION | TEXT : JAPANESE INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20091015 |
| JP2008114981 A2 | 20110906      | LSSES       | -A131 | NOTIFICATION OF REASONS FOR REFUSAL         | TEXT : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20110905 |
| JP2008114981 A2 | 20110921      | LSRE        | A521  | WRITTEN AMENDMENT                           | TEXT : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20110920 |
| JP2008114981 A2 | 20111128      | LSGT        | +TRDD | DECISION OF GRANT OR REJECTION WRITTEN      |                                                                      |
| JP2008114981 A2 | 20111206      | LSGT        | +A01  | WRITTEN DECISION TO GRANT A                 | TEXT : JAPANESE                                                      |

|                 |          |      |       |                                                                                     |                                                                              |
|-----------------|----------|------|-------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
|                 |          |      |       | PATENT OR TO GRANT A<br>REGISTRATION (UTILITY MODEL)                                | INTERMEDIATE<br>CODE: A01<br>EFFECTIVE DATE<br>: 20111205                    |
| JP2008114981 A2 | 20111208 | LSGT | +A01  | WRITTEN DECISION TO GRANT A<br>PATENT OR TO GRANT A<br>REGISTRATION (UTILITY MODEL) | TEXT : JAPANESE<br>INTERMEDIATE<br>CODE: A01                                 |
| JP2008114981 A2 | 20111215 | LSFE | +A61  | FIRST PAYMENT OF ANNUAL FEES<br>(DURING GRANT PROCEDURE)                            | TEXT : JAPANESE<br>INTERMEDIATE<br>CODE: A61<br>EFFECTIVE DATE<br>: 20111206 |
| JP2008114981 A2 | 20111216 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE<br>IS RENEWAL DATE OF DATABASE)                     | YEAR OF FEE<br>PAYMENT : 3                                                   |
| JP2008114981 A2 | 20111216 | LSGT | +R150 | CERTIFICATE OF PATENT OR<br>REGISTRATION OF UTILITY MODEL                           | TEXT : JAPANESE<br>INTERMEDIATE<br>CODE: R150                                |
| JP4884166 B2    | 20120229 | LSGT | +     | granted / extensions (spc, cpc,<br>pte)                                             |                                                                              |
| JP4884166 B2    | 20111213 | LSFE | R100  | 特許料納付書 (Patent fee payment<br>form)                                                 |                                                                              |
| JP4884166 B2    | 20141216 | LSLE | -LAPS | CANCELLATION BECAUSE OF NO<br>PAYMENT OF ANNUAL FEES                                |                                                                              |
| JP4884166 B2    | 20261106 | PEXP |       | Calculated Patent Term Expiry                                                       |                                                                              |

**Title:** Ink jet printer

**Abstract:** An ink jet printer includes a print head having ink nozzles, which is movable in a direction across the feeding path. A supply mechanism is provided at one side of the feeding path, which supplies ink to the print head located in the ink supply station. A maintenance mechanism is provided at the other side of the feeding path, which operates a predetermined operation. The ink jet printer is further provided with a first clutch which transmits the rotation of the actuator to the supply mechanism only when the print head is located in the above-mentioned one side, and a second clutch which transmits the rotation of the actuator to the maintenance mechanism only when the print head is located in the above-mentioned the other side. With this, the supply mechanism and the maintenance mechanism are actuated by a common actuator.

**Classifications:**

**International (IPC 8-9):** B41J2/01 B41J2/015 B41J23/02

B41J29/38 (Advanced/Invention);

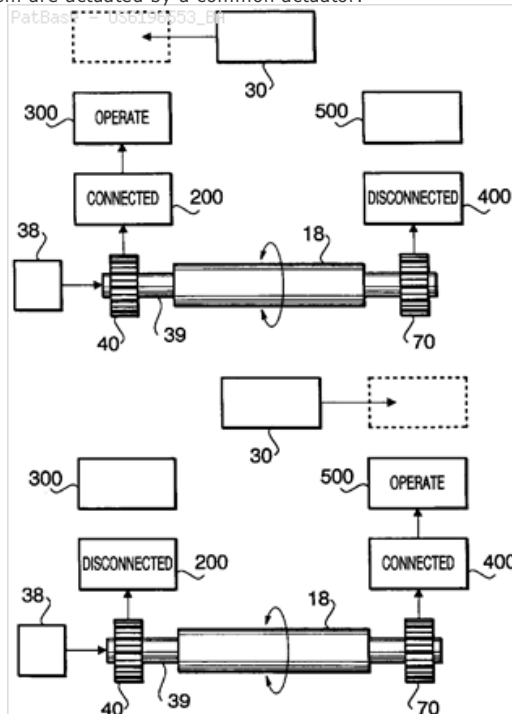
B41J2/01 B41J2/015 B41J23/00 B41J29/38 (Core/Invention)

**International (IPC 1-7):** B41J2/01 B41J2/015 B41J2/165 B41J23/02 B41J29/38

**CPC:** B41J23/025

**European:** B41J23/02B

**US:** 347/23 347/32



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP11020269 A2      | 19990126         | JP19970176915      | 19970702         |
| US6196653 BA       | 20010306         | US19980108250      | 19980701         |

**Priority:**

JP19970176915 19970702

**Probable Assignee:** BROTHER IND LTD

**Assignee(s):** (std): BROTHER IND LTD

**Assignee(s):** BROTHER KOGYO KABUSHIKI KAISHA ; BROTHER KOGYO KK

**Inventor(s):** (std): TOKUDA HIROSHI ; OGAWA HIROO ; NAKATA TAKASHI ; KIMURA SHINJI ; ISHII MAKOTO ; IGARASHI HIROSHI ; OGAWA TOSHIO ; NAKADA TAKU ; ISHII AKIRA

**Legal status (INPADOC)**

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| Patent        | Date recorded | Event group | Code  | Event                                       | Details                                                                                                  |
|---------------|---------------|-------------|-------|---------------------------------------------|----------------------------------------------------------------------------------------------------------|
| JP11020269 A2 | 19990126      | LSPB        | +     | published / reissued                        |                                                                                                          |
| JP11020269 A2 | 20040705      | LSES        | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION | TEXT : JAPANESE INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20040702                                     |
| JP11020269 A2 | 20070830      | LSES        | -A131 | NOTIFICATION OF REASONS FOR REFUSAL         | TEXT : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20070829                                     |
| JP11020269 A2 | 20080207      | LSRV        | -A02  | DECISION OF REFUSAL                         | TEXT : JAPANESE INTERMEDIATE CODE: A02<br>EFFECTIVE DATE : 20080206                                      |
| US6196653 BA  | 20010306      | LSGT        | +     | granted / extensions (spc, cpc, pte)        |                                                                                                          |
| US6196653 BA  | 19980701      | LSAS        | AS    | ASSIGNMENT                                  | PARTYTYPE : OWNER<br>OWNER : BROTHER KOGYO KABUSHIKI KAISHA, JAPAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS |

|              |          |      |                               |                                     |                                                                                                                                     |  |
|--------------|----------|------|-------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|--|
|              |          |      |                               |                                     | INTEREST; ASSIGNORS:IGARASHI, HIROSHI; OGAWA, HIROO; ISHII, MAKOTO; AND OTHERS; REEL/FRAME:009300/0662<br>EFFECTIVE DATE : 19980701 |  |
| US6196653 BA | 20010215 | LSGT | PAT1                          | Patented Case                       |                                                                                                                                     |  |
| US6196653 BA | 20010215 | LSGT | STCF                          | INFORMATION ON STATUS: PATENT GRANT | TEXT : PATENTED CASE                                                                                                                |  |
| US6196653 BA | 20040804 | LSFE | +FPAY                         | FEE PAYMENT                         | YEAR OF FEE PAYMENT : 4                                                                                                             |  |
| US6196653 BA | 20080819 | LSFE | +FPAY                         | FEE PAYMENT                         | YEAR OF FEE PAYMENT : 8                                                                                                             |  |
| US6196653 BA | 20120828 | LSFE | +FPAY                         | FEE PAYMENT                         | YEAR OF FEE PAYMENT : 12                                                                                                            |  |
| US6196653 BA | 20180701 | PEXP | Calculated Patent Term Expiry |                                     |                                                                                                                                     |  |

**Title:** Method of continuous casting using linear magnetic field for core agitation

**Abstract:** A continuous casting method for the production of a casting having a solidified metallic structure which is nearly all composed of equiaxed crystal uniformly distributed, by agitating the crater of the cast object during the process of solidification by applying a travelling electromagnetic field to an extent sufficient to make the velocity vector of the main flow of the agitated **molten** metal present in the plane perpendicular to the direction of withdrawing the cast object and to confine the entire flow in such crater within the limited agitation zone, and an apparatus for carrying out the method.

**Classifications:**

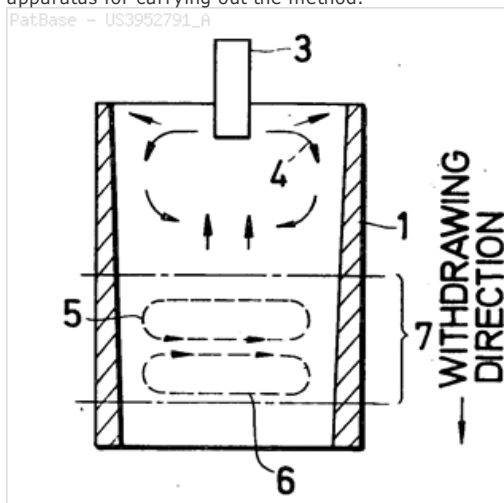
**International (IPC 8-9):** B01F13/08 B22D11/10 B22D11/11 B22D11/115 B22D11/14 B22D27/02 (Advanced/Invention); B22D11/14 (Core/Invention); B22D (Subclass/Invention)

**International (IPC 1-7):** B01F13/08 B22D11/10 B22D11/12 B22D11/14 B22D27/02 B22D27/20 H01F7/06

**CPC:** B22D11/122

**European:** B22D11/12E

**US:** 164/147 164/442 164/448 164/468 164/49 164/504



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT26974 A          | 19770115         | AT19740000269      | 19740114         |
| DE2401145 A1       | 19741031         | DE19742401145      | 19740110         |
| DE2401145 B2       | 19800508         | DE19742401145      | 19740110         |
| ES422099 A1        | 19760801         | ES19740422099      | 19740107         |
| ES445333 A1        | 19770616         | ES19760445333      | 19760219         |
| FR2323467 A1       | 19770408         | FR19740000835      | 19740110         |
| FR2323467 B1       | 19800627         | FR19740000835      | 19740110         |
| FR2376712 A1       | 19780804         | FR19780010042      | 19780405         |
| FR2376712 B1       | 19820305         | FR19780010042      | 19780405         |
| GB1454052 A        | 19761027         | GB19740000329      | 19740104         |
| IT1009593 A        | 19761220         | IT19740019888      | 19740128         |
| JP50029909 U1      | 19750404         | JP19730046371U     | 19730418         |
| JP52052895 Y2      | 19771201         | JP19730046371U     | 19730418         |
| US3952791 A        | 19760427         | US19740431605      | 19740108         |
| US4030534 A        | 19770621         | US19760649019      | 19760114         |
| ZA7400502 A        | 19741224         | ZA19740000502      | 19740124         |

**Priority:**

JP19730046371 19730418 JP19730046371U 19730418 US19740431605 19740108  
US19760649019 19760114

**Probable Assignee:** NIPPON STEEL CORP

**Assignee(s):** (std): NIPPON STEEL CORP

**Assignee(s):** NIPPON STEEL CORP TOKIO

**Inventor(s):** (std): ITO Y ; KISARAZU CHIBA JAPAN ; SUZUKI Y ; YOSHITAKE SUZUKI ; YOSHITAKE KISARAZU ; YASUO ITO ET YOSHITAKE SUZUKI ; YASUO ITO ; SUZUKI YOSHITAKE ; ITO YASUO

**Inventor(s):** ITO YASUO SUZUKI ; YOSHITAKE KISARAZU CHIBA

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code  | Event                                       | Details |
|--------------|---------------|-------------|-------|---------------------------------------------|---------|
| AT26974 A    | 19770115      | LSPB        | +     | published / reissued                        |         |
| AT26974 A    | 19790115      | LSRV        | -A1V  | REFUSAL                                     |         |
| AT26974 A    | 19880715      | LSAS        | EEIH  | CHANGE IN THE PERSON OF PATENT OWNER        |         |
| AT26974 A    | 19940515      | LSLE        | -REN  | CEASED DUE TO NON-PAYMENT OF THE ANNUAL FEE |         |
| DE2401145 A1 | 19741031      | LSPB        | +     | published / reissued                        |         |
| DE2401145 B2 | 19800508      | LSPB        | +     | published / reissued                        |         |
| DE2401145 B2 | 19820819      | LSRV        | -8235 | PATENT REFUSED                              |         |
| ES422099 A1  | 19760801      | LSGT        | +     | granted / extensions (spc, cpc, pte)        |         |
| ES445333 A1  | 19770616      | LSGT        | +     | granted / extensions (spc, cpc, pte)        |         |

|               |          |      |       |                                                  |                              |
|---------------|----------|------|-------|--------------------------------------------------|------------------------------|
| ES445333 A1   | 20071116 | LSLE | -FD1A | PATENT LAPSED                                    | EFFECTIVE DATE :<br>19970222 |
| FR2323467 A1  | 19770408 | LSPB | +     | published / reissued                             |                              |
| FR2323467 B1  | 19800627 | LSGT | +     | granted / extensions (spc, cpc, pte)             |                              |
| FR2323467 B1  | 19881125 | LSLE | -ST   | NOTIFICATION OF LAPSE                            |                              |
| FR2323467 B1  | 19940110 | PEXP |       | Calculated Patent Term Expiry                    |                              |
| FR2376712 A1  | 19780804 | LSPB | +     | published / reissued                             |                              |
| FR2376712 B1  | 19820305 | LSGT | +     | granted / extensions (spc, cpc, pte)             |                              |
| FR2376712 B1  | 19881125 | LSLE | -ST   | NOTIFICATION OF LAPSE                            |                              |
| FR2376712 B1  | 19980405 | PEXP |       | Calculated Patent Term Expiry                    |                              |
| GB1454052 A   | 19761027 | LSGT | +     | granted / extensions (spc, cpc, pte)             |                              |
| GB1454052 A   | 19770309 | LSGT | +PS   | PATENT SEALED                                    |                              |
| GB1454052 A   | 19880824 | LSLE | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE |                              |
| GB1454052 A   | 19940104 | PEXP |       | Calculated Patent Term Expiry                    |                              |
| IT1009593 A   | 19761220 | LSGT | +     | granted / extensions (spc, cpc, pte)             |                              |
| IT1009593 A   | 19940128 | PEXP |       | Calculated Patent Term Expiry                    |                              |
| JP50029909 U1 | 19750404 | LSPB | +     | published / reissued                             |                              |
| JP52052895 Y2 | 19771201 | LSPB | +     | published / reissued                             |                              |
| US3952791 A   | 19760427 | LSGT | +     | granted / extensions (spc, cpc, pte)             |                              |
| US4030534 A   | 19770621 | LSGT | +     | granted / extensions (spc, cpc, pte)             |                              |
| ZA7400502 A   | 19741224 | LSGT | +     | granted / extensions (spc, cpc, pte)             |                              |
| ZA7400502 A   | 19900123 | PEXP |       | Calculated Patent Term Expiry                    |                              |

**Title:** VARIABLE STRENGTH MATERIALS FORMED THROUGH RAPID DEFORMATION

**Abstract:** The invention relates to a material (504), having adjacent regions of differing strength and ductility, that has been formed by rapidly deforming a suitable base metal (501) having a banded structure, such as illustratively a previously cold worked low carbon steel alloy, in order to generate a high rate of change in the internal energy of the base metal. This energy change depressed the transformation temperatures of the base metal and induced an allotropic phase transformation to occur therein. Specifically, prior to being deformed, the base metal is maintained at a fairly low temperature, e.g. at or near room temperature. The tooling, preferably rolls, that is used to provide the deformation is maintained at a modestly elevated temperature. Subsequent rapid deformation of the base metal causes an extremely high heating rate to occur at each surface thereof Which, in turn, depresses the upper and lower on heating transformation temperatures at surface regions of the base metal and thereby causes the banded structure of the metal situated in these surface regions to transform into equiaxed grains. If the heating rate is insufficient to raise the temperature of the core of the base metal, which contains banded grains, to a level that causes metal in the core to transform, then the core will retain its banded cold worked structure. Consequently, the transformed surface regions (510, 510') will possess an equiaxed grain structure which provides increased ductility; while the core (511) of the material retains its banded (deformed) grain structure which provides high strength. Hence, the surfaces (512, 512') of the material become soft and ductile while the core possesses considerably higher amounts of hardness, yield and tensile strength than either surface. This material advantageously exhibits both good workability and relatively high strength. Alternatively, if the deformation rate is increased, such as by using small diameter rolls, in order to increase the bulk heating rate of the base metal and the appropriate thickness of the base metal has been chosen, then the entire base metal transforms into equiaxed grains. In this case, the resulting material (404) possesses a ductility and hence workability similar to that of a fully annealed structure.

**Classifications:**

**International (IPC 8-9):** C21D7/13 (Advanced/Invention)

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| IN00249CA1988 A    | 20160902         | IN1988CA00249      | 19880328         |

**Priority:**

IN1988CA00249 19880328

**Probable Assignee:** MRE CORP

**Assignee(s):** MRE CORP

**Inventor(s):** HUGO STANLEY FERGUSON

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code | Event                | Details |
|-----------------|---------------|-------------|------|----------------------|---------|
| IN00249CA1988 A | 20160902      | LSPB        | +    | published / reissued |         |

**Title:** AUSTENITIC ALLOY PIPE AND METHOD FOR PRODUCING THE SAME

**Abstract:** There is provided an austenitic alloy pipe that is durable even if a stress distribution different according to usage environment is applied. The austenitic alloy pipe in accordance with the present invention has a tensile yield strength YSLT of at least 689.1 MPa. The tensile yield strength YSLT, a compressive yield strength YSLC in a pipe axial direction, a tensile yield strength YSCT in a pipe circumferential direction of the alloy pipe, and a compressive yield strength YSCC in the pipe circumferential direction satisfy Formulas (1) to (4).  $0.90 \leq YSLC/YSLT \leq 1.11$  (1)  $0.90 \leq YSCC/YSCT \leq 1.11$  (2)  $0.90 \leq YSCC/YSLT \leq 1.11$  (3)  $0.90 \leq YSCT/YSLT \leq 1.11$  (4)

**Classifications:**

**International (IPC 8-9):** B21B19/04 B21B19/06 B21B3/02 B21C1/00 B21D3/02 C21D6/00 C21D7/02 C21D7/10 C21D8/10 C21D9/08 C21D9/14 C22C19/05 C22C38/00 C22C38/02 C22C38/04 C22C38/42 C22C38/44 C22C38/58 C22F1/10 F16L9/02 (Advanced/Invention); B21B19/06 (Advanced/Non-invention)

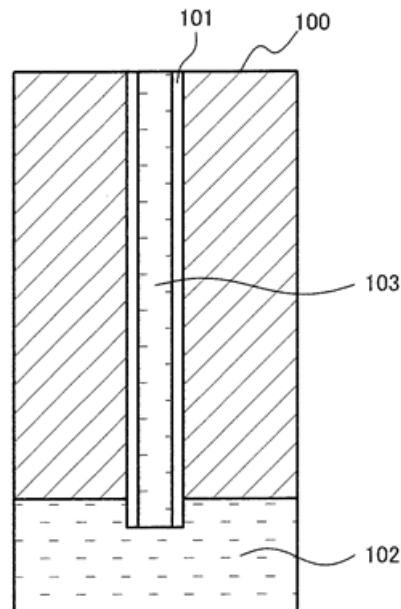
**International (IPC 1-7):** B21B3/02 C21D8/10 C21D9/08 C22C38/00 C22C38/58

**CPC:** F16L9/02 C21D8/10 B21B19/06 C21D8/105 C21D9/08 C21D9/14 C21D2211/001 C22C38/001 C22C38/02 C22C38/04 C22C38/42 C22C38/44 C21D6/004 C21D7/02 C21D7/10 B21D3/02

**European:** C21D8/10 C21D8/10A C21D9/08 C21D9/14 C22C38/00B C22C38/02 C22C38/04 C22C38/42 C22C38/44 L21B19/06 M21D211/00A

**US:** 1/1 148/442 148/707

PatBase - US2014083576\_AA



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| BR112013023620 A2  | 20161206         | BR20131123620      | 20120319         |
| BR112013023620 B1  | 20190326         | BR20131123620      | 20120319         |
| CN103443318 A      | 20131211         | CN201280014939     | 20120319         |
| CN103443318 B      | 20151125         | CN201280014939     | 20120319         |
| EP2690188 A1       | 20140129         | EP20120759950      | 20120319         |
| EP2690188 A4       | 20150624         | EP20120759950      | 20120319         |
| EP2690188 B1       | 20190123         | EP20120759950      | 20120319         |
| ES2711667 T3       | 20190506         | ES20120759950T     | 20120319         |
| JP2012128258 A1    | 20140724         | JP20120530026T     | 20120319         |
| JP5137048 B1       | 20130206         | JP20120530026T     | 20120319         |
| JP5137048 B2       | 20130206         | JP20120530026T     | 20120319         |
| RU2013147418 A     | 20150427         | RU20130147418      | 20120319         |
| RU2552805 C2       | 20150610         | RU20130147418      | 20120319         |
| US2014083576 AA    | 20140327         | US20120006156      | 20120319         |
| US9429254 BB       | 20160830         | US20120006156      | 20120319         |
| WO12128258 A1      | 20120927         | WO2012JP57041      | 20120319         |

**Priority:**

JP20110065895 20110324 EP20120759950 20120319 WO2012JP57041 20120319  
JP20120530026 20120319

**Probable Assignee:** NIPPON STEEL CORP

**Assignee(s):** (std): KURODA KOUICHI ; NIPPON STEEL AND SUMITOMO METAL CORP ; NIPPON STEEL AND SUMITOMO METAL ; NIPPON STEEL AND SUMITOMO METAL CORP ; SAWAWATARI NAOKI ; SUWABE HITOSHI ; SUMITOMO METAL IND ; NIPPON STIL EHND SUMITOMO METAL CORP ; UHEYAMA MASAKI

**Assignee(s):** NIPPON STIL EHND SUMITOMO METAL KOPOREJSHN ; NIPPON STEEL CORP ; SUMITOMO METAL IND LTD ; SUMITOMO METAL INDUSTRIES LTD

**Inventor(s):** (std): SAWAWATARI NAOKI ; SUWABE HITOSHI ; KURODA KOUICHI ; UHEYAMA MASAKI ; SAWAWATARI NAOKI ; SUWABE KHITOSI ; KURODA KOUITI ; UHEYAMA MASAKI ; KOUICHI KURODA ; MASAKI UHEYAMA ; NAOKI SAWAWATARI ; HITOSHI SUWABE

**Agent(s):** JACKSON MARTIN PETER ; J A KEMP ; PONS ANGEL ; UEBA HIDETOSHI ; MATSUYAMA TAKAO ; CLARK AND BRODY ; UEBA HIDETOSHI 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 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 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)**

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| Patent            | Date recorded | Event group | Code  | Event                                                                           | Details                                                                                                                                                                                            |
|-------------------|---------------|-------------|-------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BR112013023620 A2 | 20180911      | LSES        | B07A  | TECHNICAL EXAMINATION (OPINION): PUBLICATION OF TECHNICAL EXAMINATION (OPINION) |                                                                                                                                                                                                    |
| BR112013023620 A2 | 20190212      | LSGT        | B09A  | DECISION: INTENTION TO GRANT                                                    |                                                                                                                                                                                                    |
| BR112013023620 A2 | 20190326      | LSGT        | +B16A | PATENT OR CERTIFICATE OF ADDITION OF INVENTION GRANTED                          | TEXT : PRAZO DE VALIDADE: 20 (VINTE) ANOS CONTADOS A PARTIR DE 19/03/2012, OBSERVADAS AS CONDICOES LEGAIS.                                                                                         |
| BR112013023620 B1 | 20320319      | PEXP        |       | Calculated Patent Term Expiry                                                   |                                                                                                                                                                                                    |
| CN103443318 A     | 20131211      | LSPB        | +     | published / reissued                                                            |                                                                                                                                                                                                    |
| CN103443318 A     | 20131211      | LSPB        | +C06  | PUBLICATION                                                                     |                                                                                                                                                                                                    |
| CN103443318 A     | 20131211      | LSPB        | PB01  | 公开 (The publication of application)                                             | TEXT : 公开 (DISCLOSURE)                                                                                                                                                                             |
| CN103443318 B     | 20151125      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                            |                                                                                                                                                                                                    |
| CN103443318 B     | 20151125      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL                                                |                                                                                                                                                                                                    |
| CN103443318 B     | 20151125      | LSGT        | +GR01 | 授权 (The grant of patent right)                                                  | TEXT : 授权 (AUTHORIZATION)                                                                                                                                                                          |
| CN103443318 B     | 20190611      | LSAS        | CP01  | 专利权人姓名或者名称的变更 (Change of name of patentee)                                      | TEXT : 专利权人的姓名或者名称、地址的变更 (THE NAME OR ADDRESS OF A PATENTEE) PATENTEE AFTER CHANGE : 日本制铁株式会社 (NIPPON STEEL CORPORATION) PATENTEE BEFORE CHANGE : 新日铁住金株式会社 (NIPPON STEEL AND SUMITOMO METAL CORP) |
| CN103443318 B     | 20190611      | LSAS        | CP01  | CHANGE IN THE NAME OR TITLE OF A PATENT HOLDER                                  |                                                                                                                                                                                                    |
| CN103443318 B     | 20320319      | PEXP        |       | Calculated Patent Term Expiry                                                   |                                                                                                                                                                                                    |
| EP2690188 A1      | 20140129      | LSPB        | +     | published / reissued                                                            |                                                                                                                                                                                                    |
| EP2690188 A1      | 20140129      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                                                   | EFFECTIVE DATE : 20130903                                                                                                                                                                          |
| EP2690188 A4      | 20150624      | LSES        | +RA4  | SUPPLEMENTARY SEARCH REPORT DRAWN UP AND DESPATCHED (CORRECTED)                 | EFFECTIVE DATE : 20150522                                                                                                                                                                          |
| EP2690188 A4      | 20170104      | LSES        | +17Q  | FIRST EXAMINATION REPORT DESPATCHED                                             | EFFECTIVE DATE : 20161205                                                                                                                                                                          |
| EP2690188 A4      | 20180912      | LSGT        | +INTG | INTENTION TO GRANT ANNOUNCED                                                    | EFFECTIVE DATE : 20180815                                                                                                                                                                          |
| EP2690188 A4      | 20181107      | LSGT        | +INTG | INTENTION TO GRANT ANNOUNCED                                                    | EFFECTIVE DATE : 20181010                                                                                                                                                                          |
| EP2690188 B1      | 20190123      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                            |                                                                                                                                                                                                    |
| EP2690188 B1      | 20190123      | LSGT        | REG   | REFERENCE TO A NATIONAL CODE                                                    | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D                                                                                                                                               |
| EP2690188 B1      | 20190131      | LSNP        | REG   | REFERENCE TO A NATIONAL CODE                                                    | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                                                                                                                                 |
| EP2690188 B1      | 20190215      | LSNP        | REG   | REFERENCE TO A NATIONAL CODE                                                    | REF COUNTRY CODE : AT<br>REF LEGAL EVENT CODE : REF<br>REF DOCUMENT NUMBER : 1091507<br>COUNTRY OF REF DOCUMENT                                                                                    |

|              |          |      |       |                                                                                                                      |                                                                                                                                                                                                                            |
|--------------|----------|------|-------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       |                                                                                                                      | : AT<br>KIND CODE OF REF<br>DOCUMENT : T<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20190215                                                                                                                             |
| EP2690188 B1 | 20190220 | LSGT | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                                      | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE :<br>FG4D                                                                                                                                                                    |
| EP2690188 B1 | 20190221 | LSPB | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                                      | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE :<br>R096<br>REF DOCUMENT NUMBER :<br>602012056216<br>COUNTRY OF REF DOCUMENT<br>: DE                                                                                        |
| EP2690188 B1 | 20190430 | LSFE | +PGFP | ANNUAL FEE PAID<br>TO NATIONAL<br>OFFICE<br>[ANNOUNCED<br>FROM NATIONAL<br>OFFICE TO EPO]                            | COUNTRY OF REF DOCUMENT<br>: GB<br>PAYMENT DATE : 20190313<br>YEAR OF FEE PAYMENT : 8                                                                                                                                      |
| EP2690188 B1 | 20190430 | LSFE | +PGFP | ANNUAL FEE PAID<br>TO NATIONAL<br>OFFICE<br>[ANNOUNCED<br>FROM NATIONAL<br>OFFICE TO EPO]                            | COUNTRY OF REF DOCUMENT<br>: DE<br>PAYMENT DATE : 20190305<br>YEAR OF FEE PAYMENT : 8                                                                                                                                      |
| EP2690188 B1 | 20190506 | LSGT | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                                      | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE :<br>FG2A<br>REF DOCUMENT NUMBER :<br>2711667<br>COUNTRY OF REF DOCUMENT<br>: ES<br>KIND CODE OF REF<br>DOCUMENT : T3<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20190506  |
| EP2690188 B1 | 20190531 | LSFE | +PGFP | ANNUAL FEE PAID<br>TO NATIONAL<br>OFFICE<br>[ANNOUNCED<br>FROM NATIONAL<br>OFFICE TO EPO]                            | COUNTRY OF REF DOCUMENT<br>: FR<br>PAYMENT DATE : 20190213<br>YEAR OF FEE PAYMENT : 8                                                                                                                                      |
| EP2690188 B1 | 20190531 | LSFE | +PGFP | ANNUAL FEE PAID<br>TO NATIONAL<br>OFFICE<br>[ANNOUNCED<br>FROM NATIONAL<br>OFFICE TO EPO]                            | COUNTRY OF REF DOCUMENT<br>: AT<br>PAYMENT DATE : 20190226<br>YEAR OF FEE PAYMENT : 8                                                                                                                                      |
| EP2690188 B1 | 20190531 | LSFE | +PGFP | ANNUAL FEE PAID<br>TO NATIONAL<br>OFFICE<br>[ANNOUNCED<br>FROM NATIONAL<br>OFFICE TO EPO]                            | COUNTRY OF REF DOCUMENT<br>: SE<br>PAYMENT DATE : 20190311<br>YEAR OF FEE PAYMENT : 8                                                                                                                                      |
| EP2690188 B1 | 20190628 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>[ANNOUNCED VIA<br>POSTGRANT<br>INFORMATION<br>FROM NATIONAL<br>OFFICE TO EPO] | COUNTRY OF REF DOCUMENT<br>: NL<br>NOTIFICATION OF LAPSE :<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 : 20190123 |
| EP2690188 B1 | 20190731 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>[ANNOUNCED VIA<br>POSTGRANT<br>INFORMATION<br>FROM NATIONAL<br>OFFICE TO EPO] | COUNTRY OF REF DOCUMENT<br>: NO<br>NOTIFICATION OF LAPSE :<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 : 20190423 |
| EP2690188 B1 | 20190731 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>[ANNOUNCED VIA<br>POSTGRANT<br>INFORMATION<br>FROM NATIONAL<br>OFFICE TO EPO] | COUNTRY OF REF DOCUMENT<br>: FI<br>NOTIFICATION OF LAPSE :<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 : 20190123 |
| EP2690188 B1 | 20190731 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>[ANNOUNCED VIA<br>POSTGRANT<br>INFORMATION<br>FROM NATIONAL                   | COUNTRY OF REF DOCUMENT<br>: PT<br>NOTIFICATION OF LAPSE :<br>LAPSE BECAUSE OF FAILURE<br>TO SUBMIT A TRANSLATION<br>OF THE DESCRIPTION OR TO<br>PAY THE FEE WITHIN THE                                                    |

|                 |          |      |       |                                                                                                                      |                                                                                                                                                                                                                            |
|-----------------|----------|------|-------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       | OFFICE TO EPO]                                                                                                       | PREScribed TIME-LIMIT<br>LAPSED DATE : 20190523                                                                                                                                                                            |
| EP2690188 B1    | 20190731 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>[ANNOUNCED VIA<br>POSTGRANT<br>INFORMATION<br>FROM NATIONAL<br>OFFICE TO EPO] | COUNTRY OF REF DOCUMENT<br>: PL<br>NOTIFICATION OF LAPSE :<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 : 20190123 |
| EP2690188 B1    | 20190731 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE<br>[ANNOUNCED VIA<br>POSTGRANT<br>INFORMATION<br>FROM NATIONAL<br>OFFICE TO EPO] | COUNTRY OF REF DOCUMENT<br>: LT<br>NOTIFICATION OF LAPSE :<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 : 20190123 |
| EP2690188 B1    | 20190731 | LSFE | +PGFP | ANNUAL FEE PAID<br>TO NATIONAL<br>OFFICE<br>[ANNOUNCED<br>FROM NATIONAL<br>OFFICE TO EPO]                            | COUNTRY OF REF DOCUMENT<br>: IT<br>PAYMENT DATE : 20190430<br>YEAR OF FEE PAYMENT : 8                                                                                                                                      |
| EP2690188 B1    | 20190731 | LSFE | +PGFP | ANNUAL FEE PAID<br>TO NATIONAL<br>OFFICE<br>[ANNOUNCED<br>FROM NATIONAL<br>OFFICE TO EPO]                            | COUNTRY OF REF DOCUMENT<br>: ES<br>PAYMENT DATE : 20190401<br>YEAR OF FEE PAYMENT : 8                                                                                                                                      |
| EP2690188 B1    | 20190731 | LSFE | +PGFP | ANNUAL FEE PAID<br>TO NATIONAL<br>OFFICE<br>[ANNOUNCED<br>FROM NATIONAL<br>OFFICE TO EPO]                            | COUNTRY OF REF DOCUMENT<br>: CZ<br>PAYMENT DATE : 20190228<br>YEAR OF FEE PAYMENT : 8                                                                                                                                      |
| EP2690188 B1    | 20320319 | PEXP |       | Calculated Patent<br>Term Expiry                                                                                     |                                                                                                                                                                                                                            |
| ES2711667 T3    | 20190506 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                                           |                                                                                                                                                                                                                            |
| ES2711667 T3    | 20320319 | PEXP |       | Calculated Patent<br>Term Expiry                                                                                     |                                                                                                                                                                                                                            |
| JP2012128258 A1 | 20140724 | LSPB | +     | published /<br>reissued                                                                                              |                                                                                                                                                                                                                            |
| JP2012128258 A1 | 20190516 | LSAS | S533  | WRITTEN REQUEST<br>FOR<br>REGISTRATION OF<br>CHANGE OF NAME                                                          | TEXT : JAPANESE<br>INTERMEDIATE CODE:<br>R313533                                                                                                                                                                           |
| JP2012128258 A1 | 20190524 | LSAS | R350  | WRITTEN<br>NOTIFICATION OF<br>REGISTRATION OF<br>TRANSFER                                                            | TEXT : JAPANESE<br>INTERMEDIATE CODE: R350                                                                                                                                                                                 |
| JP5137048 B1    | 20130206 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                                           |                                                                                                                                                                                                                            |
| JP5137048 B1    | 20121011 | LSGT | +A01  | 特許査定書 (Decision<br>of patent grant)                                                                                  |                                                                                                                                                                                                                            |
| JP5137048 B1    | 20121113 | LSFE | R100  | 特許料納付書 (Patent<br>fee payment<br>form)                                                                               |                                                                                                                                                                                                                            |
| JP5137048 B1    | 20121122 | LSGT | +R150 | 特許証 (Patent<br>certificate)                                                                                          |                                                                                                                                                                                                                            |
| JP5137048 B1    | 20151022 | LSFE | R20   | 特許料納付書 (Patent<br>fee payment<br>form)                                                                               |                                                                                                                                                                                                                            |
| JP5137048 B1    | 20151027 | LSFE | R2501 | 年金領収書 (一括)<br>(Pension receipt<br>(bulk))                                                                            |                                                                                                                                                                                                                            |
| JP5137048 B1    | 20161020 | LSFE | R20   | 特許料納付書 (Patent<br>fee payment<br>form)                                                                               |                                                                                                                                                                                                                            |
| JP5137048 B1    | 20161025 | LSFE | R2501 | 年金領収書 (一括)<br>(Pension receipt<br>(bulk))                                                                            |                                                                                                                                                                                                                            |
| JP5137048 B1    | 20171019 | LSFE | R20   | 特許料納付書 (Patent<br>fee payment<br>form)                                                                               |                                                                                                                                                                                                                            |
| JP5137048 B1    | 20171024 | LSFE | R2501 | 年金領収書 (一括)<br>(Pension receipt<br>(bulk))                                                                            |                                                                                                                                                                                                                            |

|                 |          |      |         |                                                                               |                                                                                                                                                                                                                                                                    |
|-----------------|----------|------|---------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP5137048 B1    | 20181018 | LSFE | R20     | 特許料納付書 (Patent fee payment form)                                              |                                                                                                                                                                                                                                                                    |
| JP5137048 B1    | 20181023 | LSFE | R2501   | 年金領収書 (一括) (Pension receipt (bulk))                                           |                                                                                                                                                                                                                                                                    |
| JP5137048 B1    | 20190516 | LSAS | R313533 | 表示変更登録申請書 (住所) (Display change registration application (name))               |                                                                                                                                                                                                                                                                    |
| JP5137048 B1    | 20190524 | LSAS | R350    | 移転登録済通知書 (Transfer registered notice)                                         |                                                                                                                                                                                                                                                                    |
| JP5137048 B1    | 20320319 | PEXP |         | Calculated Patent Term Expiry                                                 |                                                                                                                                                                                                                                                                    |
| JP5137048 B2    | 20130206 | LSGT | +       | granted / extensions (spc, cpc, pte)                                          |                                                                                                                                                                                                                                                                    |
| JP5137048 B2    | 20121002 | LSGT | +TRDD   | DECISION OF GRANT OR REJECTION WRITTEN                                        |                                                                                                                                                                                                                                                                    |
| JP5137048 B2    | 20121010 | LSGT | +A01    | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | TEXT : JAPANESE INTERMEDIATE CODE: A01 EFFECTIVE DATE : 20121009                                                                                                                                                                                                   |
| JP5137048 B2    | 20121011 | LSGT | +A01    | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | TEXT : JAPANESE INTERMEDIATE CODE: A01                                                                                                                                                                                                                             |
| JP5137048 B2    | 20121115 | LSFE | +A61    | FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)                         | TEXT : JAPANESE INTERMEDIATE CODE: A61 EFFECTIVE DATE : 20121106                                                                                                                                                                                                   |
| JP5137048 B2    | 20121122 | LSGT | +R150   | CERTIFICATE OF PATENT OR REGISTRATION OF UTILITY MODEL                        | TEXT : JAPANESE INTERMEDIATE CODE: R150                                                                                                                                                                                                                            |
| JP5137048 B2    | 20121126 | LSFE | +FPAY   | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                  | YEAR OF FEE PAYMENT : 3                                                                                                                                                                                                                                            |
| JP5137048 B2    | 20320319 | PEXP |         | Calculated Patent Term Expiry                                                 |                                                                                                                                                                                                                                                                    |
| RU2013147418 A  | 20150427 | LSPB | +       | published / reissued                                                          |                                                                                                                                                                                                                                                                    |
| RU2552805 C2    | 20150610 | LSGT | +       | granted / extensions (spc, cpc, pte)                                          |                                                                                                                                                                                                                                                                    |
| RU2552805 C2    | 20190710 | LSAS | PD4A    | CORRECTION OF NAME OF PATENT OWNER                                            |                                                                                                                                                                                                                                                                    |
| RU2552805 C2    | 20320319 | PEXP |         | Calculated Patent Term Expiry                                                 |                                                                                                                                                                                                                                                                    |
| US2014083576 AA | 20140327 | LSPB | +       | published / reissued                                                          |                                                                                                                                                                                                                                                                    |
| US2014083576 AA | 20160810 | LSGT | STCF    | INFORMATION ON STATUS: PATENT GRANT                                           | TEXT : PATENTED CASE                                                                                                                                                                                                                                               |
| US9429254 BB    | 20160830 | LSGT | +       | granted / extensions (spc, cpc, pte)                                          |                                                                                                                                                                                                                                                                    |
| US9429254 BB    | 20130919 | LSAS | AS      | ASSIGNMENT                                                                    | PARTYTYPE : OWNER<br>OWNER : NIPPON STEEL & SUMITOMO METAL CORPORATION, JAPAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:SAWAWATARI, NAOKI; KURODA, KOUICHI; SUWABE, HITOSHI; AND OTHERS;<br>REEL/FRAME:031240/0728<br>EFFECTIVE DATE : 20130729 |
| US9429254 BB    | 20151005 | LSES | NFA1    | Non Final Action Mailed                                                       |                                                                                                                                                                                                                                                                    |
| US9429254 BB    | 20160727 | LSFE | +PPV1   | Publications -- Issue Fee Payment Verified                                    |                                                                                                                                                                                                                                                                    |

|               |          |      |      |                                              |                                                                                                                                                                                                       |
|---------------|----------|------|------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US9429254 BB  | 20160810 | LSGT | PAT1 | Patented Case                                |                                                                                                                                                                                                       |
| US9429254 BB  | 20190514 | LSAS | AS   | ASSIGNMENT                                   | PARTYTYPE : OWNER<br>OWNER : NIPPON STEEL CORPORATION, JAPAN<br>OLDPARTY : CHANGE OF NAME; ASSIGNOR:NIPPON STEEL & SUMITOMO METAL CORPORATION;<br>REEL/FRAME:049257/0828<br>EFFECTIVE DATE : 20190401 |
| US9429254 BB  | 20330202 | PEXP |      | Calculated Patent Term Expiry (PTA 320 days) |                                                                                                                                                                                                       |
| WO12128258 A1 | 20120927 | LSPB | +    | published / reissued                         |                                                                                                                                                                                                       |
| WO12128258 A1 | 20120702 | LSNP | ENP  | ENTRY INTO THE NATIONAL PHASE IN:            | REF DOCUMENT NUMBER : 2012530026<br>COUNTRY OF REF DOCUMENT : JP<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) :                                                                            |
| WO12128258 A1 | 20130919 | LSNP | +WWE | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE  | REF DOCUMENT NUMBER : 14006156<br>COUNTRY OF REF DOCUMENT : US                                                                                                                                        |
| WO12128258 A1 | 20130924 | LSNE | NENP | NON-ENTRY INTO THE NATIONAL PHASE IN:        | REF COUNTRY CODE : DE                                                                                                                                                                                 |
| WO12128258 A1 | 20131024 | LSNP | ENP  | ENTRY INTO THE NATIONAL PHASE IN:            | REF DOCUMENT NUMBER : 2013147418<br>COUNTRY OF REF DOCUMENT : RU<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) :                                                                            |
| WO12128258 A1 | 20161206 | LSNP | ENP  | ENTRY INTO THE NATIONAL PHASE IN:            | REF DOCUMENT NUMBER : 112013023620<br>COUNTRY OF REF DOCUMENT : BR<br>KIND CODE OF REF DOCUMENT : A2<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20130916                                            |

**Title:** A METHOD FOR PRODUCING A MATERIAL AND AN APPARATUS FOR THE SAME

**Abstract:** This invention relates to a method for producing micro-domain graphitic materials by use of a plasma process, and to novel micro-conical graphitic materials. By micro-domain graphitic materials we mean fullerenes, carbon nanotubes, open conical carbon structures (also named micro-cones), preferably flat graphitic sheets, or a mixture of two or all of these. The novel carbon material is open carbon micro-cone, with total disclination degrees 60 degrees and/or 120 degrees, corresponding to cone angles of respectively 112.9 degrees and/or 83.6 degrees.

**Classifications:**

**International (IPC 8-9):** B29C70/58 (Advanced/Invention)

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| IN00250CA1988 A    | 20160902         | IN1988CA00250      | 19880328         |

**Priority:**

IN1988CA00250 19880328

**Probable Assignee:** MRE CORP

**Assignee(s):** MRE CORP

**Inventor(s):** HUGO STANLEY FERGUSON

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code | Event                | Details |
|-----------------|---------------|-------------|------|----------------------|---------|
| IN00250CA1988 A | 20160902      | LSPB        | +    | published / reissued |         |

**Title:** Method and apparatus for forming confectionery product

**Abstract:** A method and apparatus for making a shaped confectionery product of Bingham plastic rheology by cold extrusion wherein particles of the confectionery product are fed between counter-rotating form rolls having depressions corresponding to the desired product shape. The particles are compacted and compressed between the form rolls and fuse together to exit with a thin web of material interconnecting the shaped confectionery product. The release of the product from the roll surface is aided by induced differential motion between the rolls.

**Classifications:**

**International (IPC 8-9):** A23G1/20 A23G3/02

B30B11/16 (Advanced/Invention);

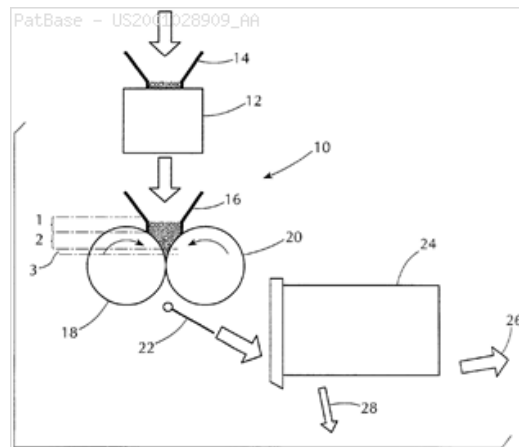
A23G1/04 A23G3/02 B30B11/00 (Core/Invention)

**International (IPC 1-7):** A01J1/00 A22C5/00 A23G1/00 A23G1/20 A23G3/02 A23P1/00 B29C43/24

**CPC:** A23G1/205 A23G1/207 A23G3/0252 A23G3/0289 B30B11/16 A23G3/02 A23G1/20 B30B11/1

**European:** A23G1/20M8 A23G1/20M8T A23G3/02M8 A23G3/02M8T B30B11/16

**US:** 425/223 425/237 425/294 425/363 426/285 426/512 426/660



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU200119582 A1     | 20010618         | AU20010019582      | 20001211         |
| AU200119582 A5     | 20010618         | AU20010019582D     | 20001211         |
| AU782099 B2        | 20050630         | AU20010019582      | 20001211         |
| BRPI0016357 A      | 20030624         | BR2000PI16357      | 20001211         |
| BRPI0016357 B1     | 20170328         | BR2000PI16357      | 20001211         |
| CA2394402 AA       | 20020613         | CA20002394402      | 20001211         |
| CA2394402 C        | 20110322         | CA20002394402      | 20001211         |
| CN1231133 C        | 20051214         | CN20008018353      | 20001211         |
| CN1423525 A        | 20030611         | CN20008018353      | 20001211         |
| DE10085299 B3      | 20190131         | DE20001085299      | 20001211         |
| DE10085299 T       | 20030508         | DE20001085299T     | 20001211         |
| DE10085299 T1      | 20030508         | DE20001085299T     | 20001211         |
| GB200214015 A0     | 20020731         | GB20020014015      | 20001211         |
| GB2373167 A1       | 20020918         | GB20020014015      | 20001211         |
| GB2373167 B2       | 20040218         | GB20020014015      | 20001211         |
| JP2003515355 T2    | 20030507         | JP20010542765T     | 20001211         |
| JP4249416 B2       | 20090402         | JP20010542765T     | 20001211         |
| PL209619 B1        | 20110930         | PL20000356458      | 20001211         |
| PL356458 A1        | 20040628         | PL20000356458      | 20001211         |
| RU2002118707 A     | 20041210         | RU20020118707      | 20001211         |
| RU2264121 C2       | 20051120         | RU20020118707      | 20001211         |
| US2001028909 AA    | 20011011         | US20010875190      | 20010607         |
| US6270826 BA       | 20010807         | US19990459474      | 19991213         |
| US6764293 BB       | 20040720         | US20010875190      | 20010607         |
| WO0141583 A1       | 20010614         | WO2000US33470      | 20001211         |

**Priority:**

US19990459474 19991213 WO2000US33470 20001211 US20010875190 20010607

**Probable Assignee:** MARS INC

**Assignee(s):** (std): AUSTIN MALCOLM ALBERT ; BRANDT ROBERT OTTO ; JONES AUBREY ELMO ; MARS INC ; KRITZER EMIL ANTHONY ; PETERSON RAY LOUIS ; KASHULINES PETER THOMAS

**Assignee(s):** KASHULINES PETER THOMAS JR ; JONES AUBREY ELMO JR ; BRANDT ROBERT OTTO JR

**Inventor(s):** (std): KEHSH JULAJNZ PITER TOMAS ML ; OSTIN MAL KOL M AL BERT ; KRITZER EHMIL EHNTONI ; BRANDT ROBERT OTTO ML ; DZHOUNZ OBRI EHLMO ML ; PETERSON REHJ LUIS ; KASHULINES PETER THOMAS ; BRANDT ROBERT OTTO ; JONES AUBREY ELMO ; EMIL A KRITZER ; JR PETER T KASHULINES EMIL A KRITZER JR ROBERT O B ; JR PETER T KASHULINES ; ROBERT OTTO BRANDT JR ; EMIL ANTHONY KRITZER ; PETER THOMAS KASHULINES JR ; MALCOLM ALBERT AUSTIN ; JR ROBERT O BRANDT ; AUBREY ELMO JONES JR ; RAY LOUIS PETERSON ; JONES JR AUBREY ELMO ; BRANDT JR ROBERT OTTO ; KASHULINES JR PETER THOMAS ; PETERSON RAY LOUIS ; AUSTIN MALCOLM ALBERT ; KRITZER EMIL ANTHONY ; BRANDT JR ROBERT O ; KRITZER EMIL A ; KASHULINES JR PETER T ; PETERSON JR PETER T KASHULINES ; JONES AUBREY ELMO JR ; BRANDT ROBERT OTTO JR ; KASHULINES PETER THOMAS JR

**Inventor(s):** JR PETER T KASHULINES EMIL A KRITZER JR ROBERT ; KRITZER EHMIL' EHNTONI ; KEHSH'JULAJNZ PITER TOMAS ML ; OSTIN MAL'KOL'M AL'BERT

**Agent(s):** WATERMARK INTELLECTUAL PROPERTY PTY LTD; WATERMARK PATENT AND TRADE MARKS ATTORNEYS; BERESKIN AND PARR; BERESKIN AND PARR LLP SENCRL SRL; CASSAN MACLEAN; CASSAN MACLEAN IP AGENCY INC

**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 CR CU CY CZ DE DK DM DZ 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 MZ 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 UZ VN YU ZA ZW

## Legal status (INPADOC)

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| Patent         | Date recorded | Event group | Code  | Event                                                                           | Details                                                                   |
|----------------|---------------|-------------|-------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| AU200119582 A1 | 20010618      | LSPB        | +     | published / reissued                                                            |                                                                           |
| AU782099 B2    | 20050630      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                            |                                                                           |
| AU782099 B2    | 20201211      | PEXP        |       | Calculated Patent Term Expiry                                                   |                                                                           |
| BRPI0016357 A  | 20030624      | LSPB        | +     | published / reissued                                                            |                                                                           |
| BRPI0016357 A  | 20120403      | LSSES       | B07A  | TECHNICAL EXAMINATION (OPINION): PUBLICATION OF TECHNICAL EXAMINATION (OPINION) |                                                                           |
| BRPI0016357 A  | 20120925      | LSSES       | B07A  | TECHNICAL EXAMINATION (OPINION): PUBLICATION OF TECHNICAL EXAMINATION (OPINION) |                                                                           |
| BRPI0016357 A  | 20130319      | LSRV        | B09B  | DECISION: REFUSAL                                                               | TEXT : INDEFIRO O PEDIDO DE ACORDO COM O(S) ARTIGO(S) 80, 13 E 25 DA LPI. |
| BRPI0016357 A  | 20140715      | LSAL        | B12B  | APPEAL: APPEAL AGAINST REFUSAL                                                  |                                                                           |
| BRPI0016357 A  | 20170328      | LSGT        | +B16A | PATENT OR CERTIFICATE OF ADDITION OF INVENTION GRANTED                          |                                                                           |
| BRPI0016357 B1 | 20201211      | PEXP        |       | Calculated Patent Term Expiry                                                   |                                                                           |
| CA2394402 AA   | 20020613      | LSPB        | +     | published / reissued                                                            |                                                                           |
| CA2394402 AA   | 20051212      | LSSES       | +EEER | EXAMINATION REQUEST                                                             |                                                                           |
| CA2394402 C    | 20110322      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                            |                                                                           |
| CA2394402 C    | 20201211      | PEXP        |       | Calculated Patent Term Expiry                                                   |                                                                           |
| CN1231133 C    | 20051214      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                            |                                                                           |
| CN1231133 C    | 20051214      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL                                                |                                                                           |
| CN1231133 C    | 20190129      | LSAS        | TR01  | TRANSFER OF PATENT RIGHT                                                        |                                                                           |
| CN1231133 C    | 20201211      | PEXP        |       | Calculated Patent Term Expiry                                                   |                                                                           |
| CN1423525 A    | 20030611      | LSPB        | +     | published / reissued                                                            |                                                                           |
| CN1423525 A    | 20030611      | LSPB        | +C06  | PUBLICATION                                                                     |                                                                           |
| DE10085299 B3  | 20190131      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                            |                                                                           |
| DE10085299 B3  | 20201211      | PEXP        |       | Calculated Patent Term Expiry                                                   |                                                                           |
| DE10085299 T   | 20030508      | LSPB        | +     | published / reissued                                                            |                                                                           |
| DE10085299 T1  | 20030508      | LSPB        | +     | published / reissued                                                            |                                                                           |
| DE10085299 T1  | 20080124      | LSSES       | +8110 | REQUEST FOR EXAMINATION PARAGRAPH 44                                            |                                                                           |
| DE10085299 T1  | 20120123      | LSSES       | R016  | RESPONSE TO EXAMINATION COMMUNICATION                                           |                                                                           |
| DE10085299 T1  | 20141202      | LSSES       | R016  | RESPONSE TO EXAMINATION COMMUNICATION                                           |                                                                           |

|                 |          |      |       |                                                                               |                                                                      |
|-----------------|----------|------|-------|-------------------------------------------------------------------------------|----------------------------------------------------------------------|
| DE10085299 T1   | 20160202 | LSES | R016  | RESPONSE TO EXAMINATION COMMUNICATION                                         |                                                                      |
| DE10085299 T1   | 20181017 | LSGT | +R018 | GRANT DECISION BY EXAMINATION SECTION/EXAMINING DIVISION                      |                                                                      |
| GB2373167 A1    | 20020918 | LSPB | +     | published / reissued                                                          |                                                                      |
| GB2373167 B2    | 20040218 | LSGT | +     | granted / extensions (spc, cpc, pte)                                          |                                                                      |
| GB2373167 B2    | 20201211 | PEXP |       | Calculated Patent Term Expiry                                                 |                                                                      |
| JP2003515355 T2 | 20030507 | LSPB | +     | published / reissued                                                          |                                                                      |
| JP2003515355 T2 | 20040506 | LSRE | A524  | WRITTEN SUBMISSION OF COPY OF AMENDMENT UNDER SECTION 19 (PCT)                | TEXT : JAPANESE INTERMEDIATE CODE: A524<br>EFFECTIVE DATE : 20040430 |
| JP2003515355 T2 | 20071207 | LSES | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION                                   | TEXT : JAPANESE INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20071206 |
| JP2003515355 T2 | 20071219 | LSES | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION                                   | TEXT : JAPANESE INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20071206 |
| JP2003515355 T2 | 20080709 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                           | TEXT : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20080708 |
| JP2003515355 T2 | 20081021 | LSRE | A521  | WRITTEN AMENDMENT                                                             | TEXT : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20081020 |
| JP2003515355 T2 | 20081106 | LSRE | A521  | WRITTEN AMENDMENT                                                             | TEXT : JAPANESE INTERMEDIATE CODE: A821<br>EFFECTIVE DATE : 20081008 |
| JP2003515355 T2 | 20081205 | LSGT | +TRDD | DECISION OF GRANT OR REJECTION WRITTEN                                        |                                                                      |
| JP2003515355 T2 | 20081216 | LSGT | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | TEXT : JAPANESE INTERMEDIATE CODE: A01<br>EFFECTIVE DATE : 20081216  |
| JP2003515355 T2 | 20081218 | LSGT | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | TEXT : JAPANESE INTERMEDIATE CODE: A01                               |
| JP2003515355 T2 | 20090122 | LSFE | +A61  | FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)                         | TEXT : JAPANESE INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20090115  |
| JP2003515355 T2 | 20090123 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                  | YEAR OF FEE PAYMENT : 3                                              |
| JP2003515355 T2 | 20090123 | LSGT | +R150 | CERTIFICATE OF PATENT OR REGISTRATION OF UTILITY MODEL                        | TEXT : JAPANESE INTERMEDIATE CODE: R150                              |
| JP4249416 B2    | 20090402 | LSGT | +     | granted / extensions (spc, cpc, pte)                                          |                                                                      |
| JP4249416 B2    | 20090120 | LSFE | R100  | 特許料納付書 (Patent fee payment form)                                              |                                                                      |
| JP4249416 B2    | 20120105 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                              |                                                                      |
| JP4249416 B2    | 20120110 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                  | YEAR OF FEE PAYMENT : 4                                              |
| JP4249416 B2    | 20121227 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                  | YEAR OF FEE PAYMENT : 4                                              |
| JP4249416 B2    | 20130108 | LSFE | +R250 | 年金領収書, 年金領収書                                                                  |                                                                      |

|                 |          |      |       |                                                     |                                                                                                                                                                                                                                                                    |
|-----------------|----------|------|-------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       | (分納) (Pension receipt, annuity receipt (scheduled)) |                                                                                                                                                                                                                                                                    |
| JP4249416 B2    | 20140109 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                    |                                                                                                                                                                                                                                                                    |
| JP4249416 B2    | 20140114 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                              | TEXT : JAPANESE INTERMEDIATE CODE: R250                                                                                                                                                                                                                            |
| JP4249416 B2    | 20150108 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                    |                                                                                                                                                                                                                                                                    |
| JP4249416 B2    | 20150113 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                              | TEXT : JAPANESE INTERMEDIATE CODE: R250                                                                                                                                                                                                                            |
| JP4249416 B2    | 20160104 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                    |                                                                                                                                                                                                                                                                    |
| JP4249416 B2    | 20160112 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                              | TEXT : JAPANESE INTERMEDIATE CODE: R250                                                                                                                                                                                                                            |
| JP4249416 B2    | 20170105 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                    |                                                                                                                                                                                                                                                                    |
| JP4249416 B2    | 20170110 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                              | TEXT : JAPANESE INTERMEDIATE CODE: R250                                                                                                                                                                                                                            |
| JP4249416 B2    | 20180104 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                    |                                                                                                                                                                                                                                                                    |
| JP4249416 B2    | 20180116 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                              | TEXT : JAPANESE INTERMEDIATE CODE: R250                                                                                                                                                                                                                            |
| JP4249416 B2    | 20190110 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                    |                                                                                                                                                                                                                                                                    |
| JP4249416 B2    | 20190115 | LSFE | +R250 | RECEIPT OF ANNUAL FEES                              | TEXT : JAPANESE INTERMEDIATE CODE: R250                                                                                                                                                                                                                            |
| JP4249416 B2    | 20201211 | PEXP |       | Calculated Patent Term Expiry                       |                                                                                                                                                                                                                                                                    |
| PL209619 B1     | 20110930 | LSGT | +     | granted / extensions (spc, cpc, pte)                |                                                                                                                                                                                                                                                                    |
| PL356458 A1     | 20040628 | LSPB | +     | published / reissued                                |                                                                                                                                                                                                                                                                    |
| RU2002118707 A  | 20041210 | LSPB | +     | published / reissued                                |                                                                                                                                                                                                                                                                    |
| RU2264121 C2    | 20051120 | LSGT | +     | granted / extensions (spc, cpc, pte)                |                                                                                                                                                                                                                                                                    |
| RU2264121 C2    | 20201211 | PEXP |       | Calculated Patent Term Expiry                       |                                                                                                                                                                                                                                                                    |
| US2001028909 AA | 20011011 | LSPB | +     | published / reissued                                |                                                                                                                                                                                                                                                                    |
| US2001028909 AA | 20040701 | LSGT | STCF  | INFORMATION ON STATUS: PATENT GRANT                 | TEXT : PATENTED CASE                                                                                                                                                                                                                                               |
| US6270826 BA    | 20010807 | LSGT | +     | granted / extensions (spc, cpc, pte)                |                                                                                                                                                                                                                                                                    |
| US6270826 BA    | 20000908 | LSAS | AS    | ASSIGNMENT                                          | PARTYTYPE : OWNER<br>OWNER : MARS INCORPORATED, VIRGINIA<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:KASHULINES, PETER T., JR.; JONES, AUBREY E., JR.; PETERSON, RAY LOUIS;<br>REEL/FRAME:011080/0482;<br>SIGNING DATES FROM 19991102 TO 19991115 |
| US6270826 BA    | 20000908 | LSAS | AS    | ASSIGNMENT                                          | PARTYTYPE : OWNER<br>OWNER : MARS INCORPORATED, VIRGINIA<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:AUSTIN, MALCOLM ALBERT;<br>REEL/FRAME:011080/0363<br>EFFECTIVE DATE : 19991206                                                                |
| US6270826 BA    | 20000908 | LSAS | AS    | ASSIGNMENT                                          | PARTYTYPE : OWNER<br>OWNER : MARS INCORPORATED, VIRGINIA<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:BRANDT, ROBERT OTTO JR.;                                                                                                                      |

|              |          |      |       |                                                      |                                                                                                                                                                                                                                                                                                     |
|--------------|----------|------|-------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       |                                                      | REEL/FRAME:011080/0485<br>EFFECTIVE DATE : 19991115                                                                                                                                                                                                                                                 |
| US6270826 BA | 20000908 | LSAS | AS    | ASSIGNMENT                                           | PARTYTYPE : OWNER<br>OWNER : MARS<br>INCORPORATED, VIRGINIA<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:KRITZER, EMIL;<br>REEL/FRAME:011080/0570<br>EFFECTIVE DATE : 19991117                                                                                                    |
| US6270826 BA | 20010719 | LSGT | PAT1  | Patented Case                                        |                                                                                                                                                                                                                                                                                                     |
| US6270826 BA | 20010719 | LSGT | STCF  | INFORMATION ON<br>STATUS: PATENT<br>GRANT            | TEXT : PATENTED CASE                                                                                                                                                                                                                                                                                |
| US6270826 BA | 20050111 | LSFE | +FPAY | FEE PAYMENT                                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                                                             |
| US6270826 BA | 20060207 | LSRE | CC    | CERTIFICATE OF<br>CORRECTION                         |                                                                                                                                                                                                                                                                                                     |
| US6270826 BA | 20090107 | LSFE | +FPAY | FEE PAYMENT                                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                                                             |
| US6270826 BA | 20130109 | LSFE | +FPAY | FEE PAYMENT                                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                                                                                            |
| US6270826 BA | 20191213 | PEXP |       | Calculated Patent<br>Term Expiry                     |                                                                                                                                                                                                                                                                                                     |
| US6764293 BB | 20040720 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)           |                                                                                                                                                                                                                                                                                                     |
| US6764293 BB | 20040701 | LSGT | PAT1  | Patented Case                                        |                                                                                                                                                                                                                                                                                                     |
| US6764293 BB | 20071231 | LSFE | +FPAY | FEE PAYMENT                                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                                                             |
| US6764293 BB | 20111221 | LSFE | +FPAY | FEE PAYMENT                                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                                                             |
| US6764293 BB | 20141207 | LSAS | AS    | ASSIGNMENT                                           | PARTYTYPE : OWNER<br>OWNER : MARS,<br>INCORPORATED, VIRGINIA<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:BRANDT, ROBERT<br>OTTO, JR.; KASHULINES, PETER<br>T., JR.; JONES, AUBREY E., JR.;<br>AND OTHERS; SIGNING DATES<br>FROM 19991102 TO 19991117;<br>REEL/FRAME:034411/0482 |
| US6764293 BB | 20141207 | LSAS | AS    | ASSIGNMENT                                           | PARTYTYPE : OWNER<br>OWNER : MARS,<br>INCORPORATED, VIRGINIA<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:AUSTIN, MALCOLM<br>ALBERT;<br>REEL/FRAME:034411/0490<br>EFFECTIVE DATE : 19991206                                                                                       |
| US6764293 BB | 20160106 | LSFE | +FPAY | FEE PAYMENT                                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                                                                                            |
| US6764293 BB | 20220118 | PEXP |       | Calculated Patent<br>Term Expiry (PTA<br>225 days)   |                                                                                                                                                                                                                                                                                                     |
| WO0141583 A1 | 20010614 | LSPB | +     | published /<br>reissued                              |                                                                                                                                                                                                                                                                                                     |
| WO0141583 A1 | 20020613 | LSNP | ENP   | ENTRY INTO THE<br>NATIONAL PHASE<br>IN:              | REF DOCUMENT NUMBER : 2001<br>542765<br>COUNTRY OF REF DOCUMENT :<br>JP<br>KIND CODE OF REF DOCUMENT :<br>A<br>DESIGNATED STATE(S) :                                                                                                                                                                |
| WO0141583 A1 | 20020613 | LSNP | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE | REF DOCUMENT NUMBER :<br>19582/01<br>COUNTRY OF REF DOCUMENT :<br>AU                                                                                                                                                                                                                                |
| WO0141583 A1 | 20020613 | LSNP | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE | REF DOCUMENT NUMBER :<br>2394402<br>COUNTRY OF REF DOCUMENT :<br>CA                                                                                                                                                                                                                                 |
| WO0141583 A1 | 20020618 | LSNP | ENP   | ENTRY INTO THE<br>NATIONAL PHASE<br>IN:              | REF DOCUMENT NUMBER :<br>200214015<br>COUNTRY OF REF DOCUMENT :<br>GB<br>KIND CODE OF REF DOCUMENT :<br>A<br>DESIGNATED STATE(S) :                                                                                                                                                                  |

|              |          |      |      |                                                           |                                                                                                                                          |
|--------------|----------|------|------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| WO0141583 A1 | 20020712 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE      | REF DOCUMENT NUMBER :<br>008183538<br>COUNTRY OF REF DOCUMENT :<br>CN                                                                    |
| WO0141583 A1 | 20020715 | LSNP | ENP  | ENTRY INTO THE<br>NATIONAL PHASE<br>IN:                   | REF DOCUMENT NUMBER : 2002<br>2002118707<br>COUNTRY OF REF DOCUMENT :<br>RU<br>KIND CODE OF REF DOCUMENT :<br>A<br>DESIGNATED STATE(S) : |
| WO0141583 A1 | 20021017 | LSWD | REG  | REFERENCE TO<br>NATIONAL CODE                             | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : 8642                                                                                     |
| WO0141583 A1 | 20030129 | LSNE | -122 | EP: PCT<br>APPLICATION NON-<br>ENTRY IN EUROPEAN<br>PHASE | REF COUNTRY CODE : WO                                                                                                                    |
| WO0141583 A1 | 20030508 | LSNP | +WWE | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE      | REF DOCUMENT NUMBER :<br>10085299<br>COUNTRY OF REF DOCUMENT :<br>DE                                                                     |
| WO0141583 A1 | 20051013 | LSGT | +WWG | WIPO<br>INFORMATION:<br>GRANT IN NATIONAL<br>OFFICE       | REF DOCUMENT NUMBER :<br>19582/01<br>COUNTRY OF REF DOCUMENT :<br>AU                                                                     |

**Title:** AUTOMATIC SHAPING METHOD FOR PRODUCTION OF HIVE-LIKE VENETIAN BLINDS

**Abstract:** An automatic shaping method for production of hive-like Venetian blinds being preset in width and full length, draping length (or folds thereof) beforehand via an electric equipment is consisted of several operation steps. First, half-produced hive-like slats of said blind are formed in the first sealing step of high frequency welding after two roller fabrics of the same width sent out separately via **roller shafts** are met at a material-feeding wheel, and then sealed at both corresponding edges thereof and printed with decoration patterns thereon via an ultrasonic wave device. Second, the step of glue-applying, said half-produced hive-like slats are applied with thermal **molten** glue at the bottom side thereof according to the pre-set draping length thereof before an automatic detection unit sensors out the defectives for a cutting device to exclude the defectives thereof and divide said half-produced hive-like slats at a pre-set length. Third, each piece of said cut half-produced hive-like slats, sent into a guide groove of a housing unit, is pressed downwards via an automatic pressing board to be piled on top of the prior hive-like slat sent in before and stuck thereto via said thermal **molten** glue to form a hive-like blind. After being laminated into the present draping length or folds thereof, said hive-like slats are sent out from the bottom side of said housing unit to obtain a hive-like Venetian blind with decoration patterns disposed at both lateral edges thereon.

**Classifications:**

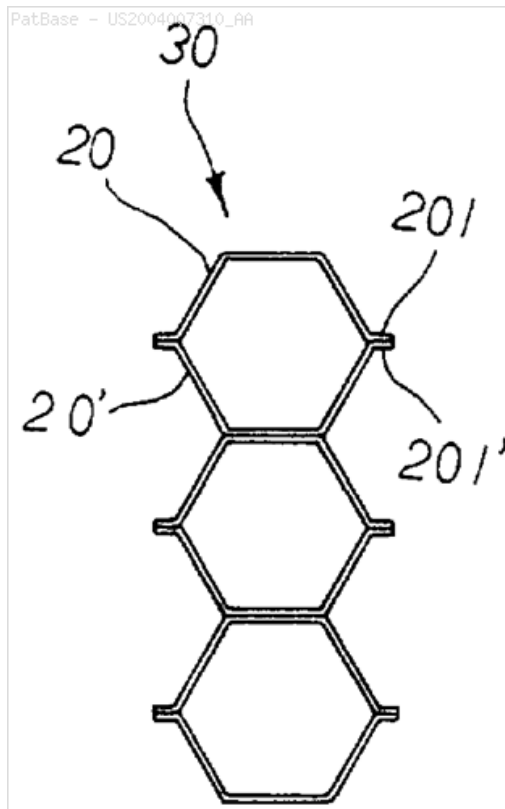
**International (IPC 8-9):** E06B3/48 E06B9/262 (Advanced/Invention); E06B9/26 (Core/Invention)

**International (IPC 1-7):** B32B3/00 E06B3/48

**CPC:** B29C65/04 B29C65/08 B29C66/1122 B29C2793/0027 B29L2031/7192 E06B2009/2627 Y10T156/1003 E06B9/262 B29C66/305 B29C66/432 B29C66/437 B29C66/438 B29C65/081 B29C65/085 B29C66/8322 B29C66/83415 B29C65/4815

**European:** B29C66/305 B29C66/437 B29C66/50 E06B9/262 L29C65/04 L29C65/08 L29C66/1122 L29C66/43 L29C793/00C L29L31/7192 P06B9/262C

**US:** 156/197 156/197S 156/70 156/70P 156/73.1 156/73.100S

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| TW513514 B         | 20021211         | TW20020111008      | 20020524         |
| US2004007310 AA    | 20040115         | US20020190571      | 20020709         |

**Priority:**

TW20020111008 20020524 US20020190571 20020709

**Probable Assignee:**

CHING FENG BLINDS IND CO LTD

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

CHING FENG BLINDS IND CO LTD

**Assignee(s):**

CHING FENG BLINDS IND CO

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

HSU PEY SON

**Legal status (INPADOC)**

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| Patent     | Date recorded | Event group | Code  | Event                                                    | Details |
|------------|---------------|-------------|-------|----------------------------------------------------------|---------|
| TW513514 B | 20021211      | LSGT        | +     | granted / extensions (spc, cpc, pte)                     |         |
| TW513514 B | 20030415      | LSGT        | +GD4A | ISSUE OF PATENT CERTIFICATE FOR GRANTED INVENTION PATENT |         |
| TW513514 B | 20080911      | LSLE        | -MM4A | ANNULMENT OR LAPSE OF PATENT DUE TO NON-PAYMENT OF FEES  |         |
| TW513514 B | 20220524      | PEXP        |       | Calculated Patent Term Expiry                            |         |

|                 |          |      |       |                                                           |                                                                                                                                                                                                              |
|-----------------|----------|------|-------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2004007310 AA | 20040115 | LSPB | +     | published /<br>reissued                                   |                                                                                                                                                                                                              |
| US2004007310 AA | 20020709 | LSAS | AS    | ASSIGNMENT                                                | PARTYTYPE : OWNER<br>OWNER : CHING FENG BLINDS<br>IND. CO., LTD., TAIWAN<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:HSU, PEY-SON;<br>REEL/FRAME:013087/0472<br>EFFECTIVE DATE : 20020508 |
| US2004007310 AA | 20070107 | LSWD | -ABD3 | Abandoned --<br>Failure to Respond<br>to an Office Action |                                                                                                                                                                                                              |

**Title:** IMPROVED RECIPROCATING DEVICES

**Abstract:** The disclosure relates to fluid working devices including reciprocating internal combustion engines, compressors and pumps. A number of arrangements for pistons and cylinders of unconventional configuration are described, mostly intended for use in reciprocating internal combustion IC engines operating without cooling. Included are toroidal combustion or working chambers, some with fluid flow through the core of the toroid, pistons reciprocating between pairs of working chambers, tensile valve actuation, tensile links between piston and crankshaft, energy absorbing piston - crank links, crankshafts supported on gas bearings, cylinders rotating in housings, injectors having components reciprocate or rotate during fuel delivery. In some embodiments pistons may rotate while reciprocating. High temperature exhaust emissions systems are described, including those containing filamentary material, as are procedures for reducing emissions during cold start by means of valves at reaction volume exit. Compound engines having the new engines as a reciprocating stage are described. Improved vehicles, aircraft, marine craft and transmissions adapted to receive or be linked to the improved IV engines are also disclosed.

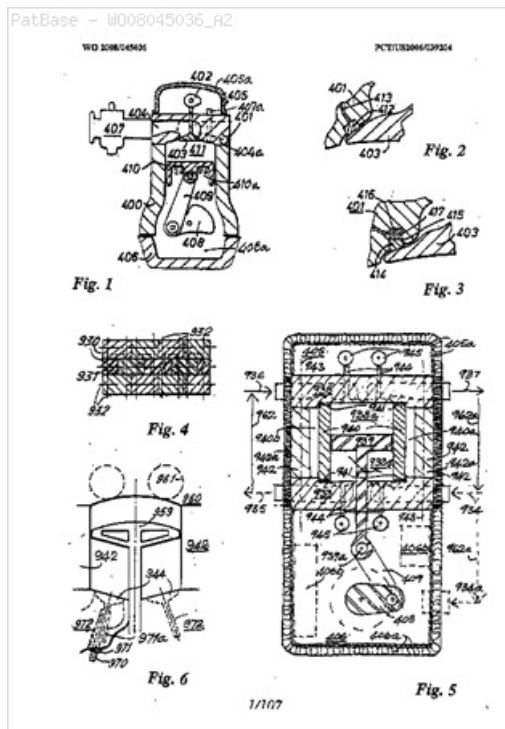
**Classifications:**

**International (IPC 8-9):** B63B1/10 F01B F01P3/02 F02B F02B77/11 F02F3/00 F02F7/00 (Advanced/Invention); F01B1/10 F02B75/00 (Advanced/Non-invention); F01P3/02 F02B77/11 F02F3/00 F02F7/00 (Core/Invention)

**International (IPC 1-7):** F01P3/02

**CPC:** F01B1/10 F02B75/002 B63H21/14 Y02T70/5209 Y02T70/5218 Y02T70/5281 Y02T90/46

**European:** F01B1/10 F01P3/02 F02B75/00B

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AP200904853 A0     | 20090630         | AP20090004853      | 20061005         |
| AU2006349461 AA    | 20080417         | AU20060349461      | 20061005         |
| AU2006349461 BB    | 20140403         | AU20060349461      | 20061005         |
| AU2014203584 AA    | 20140717         | AU20140203584      | 20140630         |
| AU2014203584 BB    | 20161117         | AU20140203584      | 20140630         |
| BRPI0622106 A2     | 20111220         | BR2006PI22106      | 20061005         |
| EP2069619 A2       | 20090617         | EP20060825584      | 20061005         |
| EP2535258 A2       | 20121219         | EP20120005377      | 20061005         |
| EP2594763 A2       | 20130522         | EP20120005378      | 20061005         |
| EP2594763 A3       | 20130911         | EP20120005378      | 20061005         |
| HK1185646 A1       | 20140221         | HK20130113077      | 20131122         |
| IN02517CN2009 A    | 20100402         | IN2009CN02517      | 20090505         |
| WO08045036 A2      | 20080417         | WO2006US39204      | 20061005         |
| WO08045036 A3      | 20080821         | WO2006US39204      | 20061005         |

**Priority:**

AU20060349461 20061005 WO2006US39204 20061005 EP20060825584 20061005  
 EP20120005378 20061005 AU20140203584 20140630

**Probable Assignee:** HINDERKS M V

**Assignee(s):** (std): HINDERKS M V ; HINDERKS MITJA

**Assignee(s):** HINDERKS MITJA VICTOR ; MITJA HINDERKS ; MITJA VICTOR HINDERKS

**Inventor(s):** (std): HINDERKS MITJA VICTOR

**Inventor(s):** MITJA VICTOR HINDERKS ; HINDERKS MITJA

**Agent(s):** WATERMARK PATENT AND TRADE MARKS ATTORNEYS; HINDERKS MITJA; HALFORDS IP; LAHRTZ FRITZ; WENPING AND CO

**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 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 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)**

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| Patent          | Date recorded | Event group | Code  | Event                                                                                             | Details                                                                                                                    |
|-----------------|---------------|-------------|-------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| AU2006349461 AA | 20080417      | LSPB        | +     | published / reissued                                                                              |                                                                                                                            |
| AU2006349461 BB | 20140403      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                              |                                                                                                                            |
| AU2006349461 BB | 20140731      | LSGT        | +FGA  | LETTERS PATENT SEALED OR GRANTED (STANDARD PATENT)                                                |                                                                                                                            |
| AU2006349461 BB | 20261005      | PEXP        |       | Calculated Patent Term Expiry                                                                     |                                                                                                                            |
| AU2014203584 AA | 20140717      | LSPB        | +     | published / reissued                                                                              |                                                                                                                            |
| AU2014203584 AA | 20170316      | LSGT        | +FGA  | LETTERS PATENT SEALED OR GRANTED (STANDARD PATENT)                                                |                                                                                                                            |
| AU2014203584 BB | 20161117      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                              |                                                                                                                            |
| AU2014203584 BB | 20340630      | PEXP        |       | Calculated Patent Term Expiry                                                                     |                                                                                                                            |
| BRPI0622106 A2  | 20120403      | LSRV        | -B11A | DISMISSAL ACC. ART.33 OF IPL - EXAMINATION NOT REQUESTED WITHIN 36 MONTHS OF FILING               |                                                                                                                            |
| BRPI0622106 A2  | 20120807      | LSES        | B04C  | REQUEST FOR EXAMINATION: REINSTATEMENT - ARTICLE 33, SOLELY PARAGRAPH, OF INDUSTRIAL PROPERTY LAW |                                                                                                                            |
| EP2069619 A2    | 20090617      | LSPB        | +     | published / reissued                                                                              |                                                                                                                            |
| EP2069619 A2    | 20090617      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                                                                     | EFFECTIVE DATE : 20090330                                                                                                  |
| EP2069619 A2    | 20100811      | LSES        | +17Q  | FIRST EXAMINATION REPORT DESPATCHED                                                               | EFFECTIVE DATE : 20100713                                                                                                  |
| EP2069619 A2    | 20170914      | LSRV        | REG   | REFERENCE TO A NATIONAL CODE                                                                      | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R003                                                                       |
| EP2069619 A2    | 20171018      | LSAS        | RAP1  | RIGHTS OF AN APPLICATION TRANSFERRED                                                              | PARTYTYPE : OWNER<br>OWNER : HINDERKS, MITJA VICTOR                                                                        |
| EP2069619 A2    | 20171108      | LSRV        | -18R  | APPLICATION REFUSED                                                                               | EFFECTIVE DATE : 20170914                                                                                                  |
| EP2535258 A2    | 20121219      | LSPB        | +     | published / reissued                                                                              |                                                                                                                            |
| EP2535258 A2    | 20130703      | LSDW        | -18D  | APPLICATION DEEMED TO BE WITHDRAWN                                                                | EFFECTIVE DATE : 20130124                                                                                                  |
| EP2594763 A2    | 20130522      | LSPB        | +     | published / reissued                                                                              |                                                                                                                            |
| EP2594763 A3    | 20140827      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                                                                     | EFFECTIVE DATE : 20140716                                                                                                  |
| EP2594763 A3    | 20171018      | LSES        | +17Q  | FIRST EXAMINATION REPORT DESPATCHED                                                               | EFFECTIVE DATE : 20170918                                                                                                  |
| EP2594763 A3    | 20171025      | LSAS        | RAP1  | RIGHTS OF AN APPLICATION TRANSFERRED                                                              | PARTYTYPE : OWNER<br>OWNER : HINDERKS, MITJA VICTOR                                                                        |
| HK1185646 A1    | 20140221      | LSPB        | +     | published / reissued                                                                              |                                                                                                                            |
| IN02517CN2009 A | 20100402      | LSPB        | +     | published / reissued                                                                              |                                                                                                                            |
| WO08045036 A2   | 20080417      | LSPB        | +     | published / reissued                                                                              |                                                                                                                            |
| WO08045036 A3   | 20090330      | LSNP        | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                                                       | REF DOCUMENT NUMBER : 2006825584<br>COUNTRY OF REF DOCUMENT : EP                                                           |
| WO08045036 A3   | 20090402      | LSNP        | ENP   | ENTRY INTO THE NATIONAL PHASE IN:                                                                 | REF DOCUMENT NUMBER : 2009531365<br>COUNTRY OF REF DOCUMENT : JP<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) : |
| WO08045036 A3   | 20090407      | LSNE        | NENP  | NON-ENTRY INTO THE NATIONAL                                                                       | REF COUNTRY                                                                                                                |

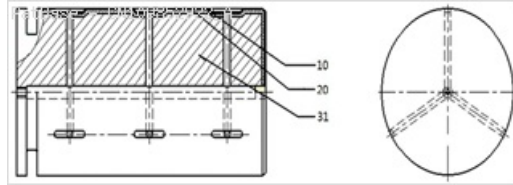
|               |          |      |      | PHASE IN:                                   | CODE : DE                                                                                                                                                     |
|---------------|----------|------|------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WO08045036 A3 | 20090407 | LSNP | +WWE | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE | REF DOCUMENT NUMBER : 12009500658<br>COUNTRY OF REF DOCUMENT : PH                                                                                             |
| WO08045036 A3 | 20090504 | LSNP | +WWE | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE | REF DOCUMENT NUMBER : 2006349461<br>COUNTRY OF REF DOCUMENT : AU                                                                                              |
| WO08045036 A3 | 20090504 | LSNP | +WWE | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE | REF DOCUMENT NUMBER : 576695<br>COUNTRY OF REF DOCUMENT : NZ                                                                                                  |
| WO08045036 A3 | 20090505 | LSNP | +WWE | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE | REF DOCUMENT NUMBER : 2517/CHENP/2009<br>COUNTRY OF REF DOCUMENT : IN                                                                                         |
| WO08045036 A3 | 20090528 | LSNP | ENP  | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : 2006349461<br>COUNTRY OF REF DOCUMENT : AU<br>DATE OF REF DOCUMENT : 20061005<br>KIND CODE OF REF DOCUMENT : A<br>DESIGNATED STATE(S) : |
| WO08045036 A3 | 20090821 | LSNE | NENP | NON-ENTRY INTO THE NATIONAL PHASE IN:       | REF COUNTRY CODE : JP                                                                                                                                         |
| WO08045036 A3 | 20111220 | LSNP | ENP  | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : PI0622106<br>COUNTRY OF REF DOCUMENT : BR<br>KIND CODE OF REF DOCUMENT : A2<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20090402       |

**Title:** One kind of PC beams bearing hinge shaft, roller corrosion resistant treatment process (Machine translation)

**Abstract:** Source: CN109852922A **Machine translation:** The present disclosure relates to a PC beams bearing hinge shaft, roller corrosion resistant treatment process, the process comprising the steps of: Pc beams bearing hinge shaft, **roller shaft** inside and outside surface cleaning treatment; The pre-heat treatment: At a temperature of 200 to 450 degrees centigrade air resistance furnace preheated 30 ~ 100min; Liquid ion nitriding treatment: The  $CNO^{-1}$  ion mass fraction of 28% to 40% in the **molten** salt heating stages heating; The passivation oxide treatment: At a temperature of 200 to 400 degrees centigrade in the salt bath furnace treatment 10 ~ 40min; Low temperature aging treatment: At a temperature of 150 to 200 degrees centigrade air resistance furnace for 3 ~ 5 hours. The present disclosure provides a process can be PC beam bearing hinge shaft, **roller shaft** wear performance improved 4 ~ 6 times, corrosion resistance increased by 5 to 10 times.

**Classifications:**

**International (IPC 8-9):** C23C8/58 C23C8/80 (Advanced/Invention)



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN109852922 A      | 20190607         | CN201811606214     | 20181227         |

**Priority:**

CN201811606214 20181227

**Probable Assignee:** CASTING AND FORGING CO LTD SHAANXI IRON HORSE

**Assignee(s):** CASTING AND FORGING CO LTD SHAANXI IRON HORSE

**Legal status (INPADOC)**

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| Patent        | Date recorded | Event group | Code | Event                | Details |
|---------------|---------------|-------------|------|----------------------|---------|
| CN109852922 A | 20190607      | LSPB        | +    | published / reissued |         |
| CN109852922 A | 20190607      | LSPB        | PB01 | PUBLICATION          |         |

**Title:** DURABLE GRAPHITE CONNECTOR AND METHOD FOR MANUFACTURING THEREOF

**Abstract:** An article comprising a graphite part coated with a pyrolytic graphite (pG) for increased mechanical strength of at least 25 percent over an uncoated graphite part. In connector applications for use in a semiconductor processing assembly such as a heater, the pG coated component is overcoated with at least a protective layer of an electrically insulating material, and wherein part of the pG coated graphite part is exposed (uncoated with the protective layer) for providing electrical connections to the assembly.

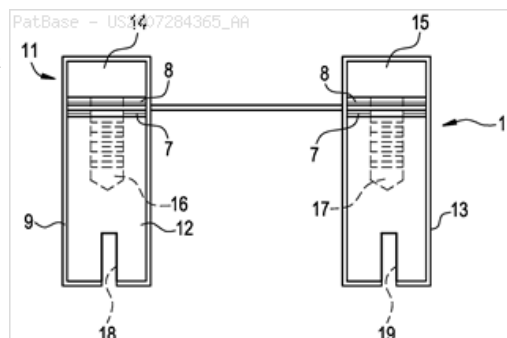
**Classifications:**

**International (IPC 8-9):** C04B41/50 C04B41/89 C23C16/46 H01L21/00 H01L21/02 H01L21/67 H01L21/683 H01L21/687 H05B3/02 H05B3/14 H05B3/16 H05B3/74 (Advanced/Invention); C23C16/00 H01L21/00 H01L21/683 H01L21/687 H05B3/14 (Advanced/Non-invention); C04B41/89 C23C16/46 H01L21/02 H01L21/67 H05B3/02 H05B3/14 H05B3/68 (Core/Invention)

**CPC:** H01L21/68714 C04B41/009 C04B41/52 C04B41/89 H05B3/145 H05B3/265

**European:** C04B41/00V C04B41/52 C04B41/89 H01L21/687S H05B3/14G H05B3/26C

**US:** 118/725 118/728 219/443.1 219/444.1 219/540 219/543 219/544 219/546 219/548 219/553 338/248 338/249 392/407 392/432

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN101085708 A      | 20071212         | CN200610064742     | 20061130         |
| CN101085708 B      | 20121114         | CN200610064742     | 20061130         |
| DE102006056990 A1  | 20071213         | DE200610056990     | 20061130         |
| JP2007335831 A2    | 20071227         | JP20060323722      | 20061130         |
| KR20070118203 A    | 20071214         | KR20060120215      | 20061130         |
| US2007284365 AA    | 20071213         | US20060549101      | 20061012         |
| US7420143 BB       | 20080902         | US20060549101      | 20061012         |

**Priority:**

US20060804447P 20060611 US20060549101 20061012

**Probable Assignee:** MOMENTIVE PERFORMANCE MATERIALS INC

**Assignee(s):** (std): MOMENTIVE PERFORMANCE MAT INC ; GEN ELECTRIC

**Assignee(s):** GENERAL ELECTRIC COMPANY ; MOMENTIVE PERFORMANCE MATERIALS INC ; JPMORGAN CHASE BANK NA ; BOKF NA SUCCESSOR COLLATERAL AGENT AS ; BNP PARIBAS ADMINISTRATIVE AGENT AS ; CITIBANK NA ADMINISTRATIVE AGENT AS ; KOOKMIN BANK NEW YORK BRANCH ADMINISTRATIVE AGENT AS ; BANK OF NEW YORK MELLON TRUST CO ; BANK OF NEW YORK MELLON TRUST CO NA ; BANK OF NEW YORK MELLON TRUST CO NA COLLATERAL AGENT AS ; BANK OF NEW YORK MELLON TRUST CO NA COLLATERAL TRU ; BANK OF NEW YORK MELLON TRUST CO NA COLLATERAL TRUSTEE AS ; GENERAL ELECTRIC CO

**Inventor(s):** (std): HEJL TIMOTHY J ; LONGWORTH DOUGLAS ALAN ; LIU XIANG ; LU ZHONG HAO ; HEIL TIMOTHY J ; LONGWORTH DOUGLAS A ; ZHONG HAO LU ; XIANG LIU ; ALAN LONGWORTH DOUGLAS

**Agent(s):** MOMENTIVE PERFORMANCE MATERIALS INC QUARTZ C O DILWORTH AND BARRESE LLP; VICARI DOMINICK G; DOMINICK G

**Legal status (INPADOC)**

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| Patent            | Date recorded | Event group | Code  | Event                                                              | Details                      |
|-------------------|---------------|-------------|-------|--------------------------------------------------------------------|------------------------------|
| CN101085708 A     | 20071212      | LSPB        | +     | published / reissued                                               |                              |
| CN101085708 A     | 20071212      | LSPB        | +C06  | PUBLICATION                                                        |                              |
| CN101085708 B     | 20121114      | LSGT        | +     | granted / extensions (spc, cpc, pte)                               |                              |
| CN101085708 B     | 20121114      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL                                   |                              |
| CN101085708 B     | 20261130      | PEXP        |       | Calculated Patent Term Expiry                                      |                              |
| DE102006056990 A1 | 20071213      | LSPB        | +     | published / reissued                                               |                              |
| DE102006056990 A1 | 20140220      | LSDW        | -R005 | APPLICATION DEEMED WITHDRAWN DUE TO FAILURE TO REQUEST EXAMINATION | EFFECTIVE DATE : 20131203    |
| JP2007335831 A2   | 20071227      | LSPB        | +     | published / reissued                                               |                              |
| JP2007335831 A2   | 20071011      | LSRE        | A521  | WRITTEN                                                            | TEXT : JAPANESE INTERMEDIATE |

|                 |          |      |       |                                                      |                                                                                                                                                                                                                                                                                                                    |
|-----------------|----------|------|-------|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       | AMENDMENT                                            | CODE: A523<br>EFFECTIVE DATE : 20071010                                                                                                                                                                                                                                                                            |
| JP2007335831 A2 | 20091015 | LSES | +A621 | WRITTEN<br>REQUEST FOR<br>APPLICATION<br>EXAMINATION | TEXT : JAPANESE INTERMEDIATE<br>CODE: A621<br>EFFECTIVE DATE : 20091014                                                                                                                                                                                                                                            |
| JP2007335831 A2 | 20100130 | LSRE | A521  | WRITTEN<br>AMENDMENT                                 | TEXT : JAPANESE INTERMEDIATE<br>CODE: A523<br>EFFECTIVE DATE : 20100129                                                                                                                                                                                                                                            |
| JP2007335831 A2 | 20120619 | LSES | -A131 | NOTIFICATION<br>OF REASONS<br>FOR REFUSAL            | TEXT : JAPANESE INTERMEDIATE<br>CODE: A131<br>EFFECTIVE DATE : 20120618                                                                                                                                                                                                                                            |
| JP2007335831 A2 | 20121113 | LSRV | -A02  | DECISION OF<br>REFUSAL                               | TEXT : JAPANESE INTERMEDIATE<br>CODE: A02<br>EFFECTIVE DATE : 20121112                                                                                                                                                                                                                                             |
| KR20070118203 A | 20071214 | LSPB | +     | published /<br>reissued                              |                                                                                                                                                                                                                                                                                                                    |
| KR20070118203 A | 20111129 | LSES | A201  | REQUEST FOR<br>EXAMINATION                           |                                                                                                                                                                                                                                                                                                                    |
| KR20070118203 A | 20130227 | LSES | -E902 | NOTIFICATION<br>OF REASON<br>FOR REFUSAL             |                                                                                                                                                                                                                                                                                                                    |
| KR20070118203 A | 20130801 | LSRV | -E601 | DECISION TO<br>REFUSE<br>APPLICATION                 |                                                                                                                                                                                                                                                                                                                    |
| US2007284365 AA | 20071213 | LSPB | +     | published /<br>reissued                              |                                                                                                                                                                                                                                                                                                                    |
| US2007284365 AA | 20080813 | LSGT | STCF  | INFORMATION<br>ON STATUS:<br>PATENT<br>GRANT         | TEXT : PATENTED CASE                                                                                                                                                                                                                                                                                               |
| US7420143 BB    | 20080902 | LSGT | +     | granted /<br>extensions<br>(spc, cpc,<br>pte)        |                                                                                                                                                                                                                                                                                                                    |
| US7420143 BB    | 20061012 | LSAS | AS    | ASSIGNMENT                                           | PARTYTYPE : OWNER<br>OWNER : GENERAL ELECTRIC<br>COMPANY, NEW YORK<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:LONGWORTH,<br>DOUGLAS ALAN; HEJL, TIMOTHY J;<br>LU, ZHONG-HAO; AND OTHERS;<br>REEL/FRAME:018383/0704<br>EFFECTIVE DATE : 20061012                                               |
| US7420143 BB    | 20070921 | LSAS | AS    | ASSIGNMENT                                           | PARTYTYPE : OWNER<br>OWNER : MOMENTIVE<br>PERFORMANCE MATERIALS INC.,<br>CONNECTICUT<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNOR:GENERAL ELECTRIC<br>COMPANY;<br>REEL/FRAME:019857/0538<br>EFFECTIVE DATE : 20070911                                                                            |
| US7420143 BB    | 20080813 | LSGT | PAT1  | Patented Case                                        |                                                                                                                                                                                                                                                                                                                    |
| US7420143 BB    | 20090701 | LSAS | AS    | ASSIGNMENT                                           | PARTYTYPE : OWNER<br>OWNER : THE BANK OF NEW YORK<br>MELLON TRUST COMPANY, N.A., A<br>OLDPARTY : SECURITY AGREEMENT;<br>ASSIGNORS:MOMENTIVE<br>PERFORMANCE MATERIALS, INC.;<br>JUNIPER BOND HOLDINGS I LLC;<br>JUNIPER BOND HOLDINGS II LLC;<br>AND OTHERS;<br>REEL/FRAME:022902/0461<br>EFFECTIVE DATE : 20090615 |
| US7420143 BB    | 20120302 | LSFE | +FPAY | FEE PAYMENT                                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                                                                                            |
| US7420143 BB    | 20120531 | LSAS | AS    | ASSIGNMENT                                           | PARTYTYPE : OWNER<br>OWNER : BANK OF NEW YORK<br>MELLON TRUST COMPANY, N.A.,<br>THE,<br>OLDPARTY : SECURITY AGREEMENT;<br>ASSIGNOR:MOMENTIVE<br>PERFORMANCE MATERIALS INC;<br>REEL/FRAME:028344/0208<br>EFFECTIVE DATE : 20120525                                                                                  |
| US7420143 BB    | 20130403 | LSAS | AS    | ASSIGNMENT                                           | PARTYTYPE : OWNER<br>OWNER : BANK OF NEW YORK<br>MELLON TRUST COMPANY, N.A.,<br>THE,                                                                                                                                                                                                                               |

|              |          |      |       |             |                                                                                                                                                                                                                                                                                                                                            |
|--------------|----------|------|-------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       |             | OLDPARTY : PATENT SECURITY AGREEMENT; ASSIGNOR:MOMENTIVE PERFORMANCE MATERIALS INC.; REEL/FRAME:030185/0001 EFFECTIVE DATE : 20121116                                                                                                                                                                                                      |
| US7420143 BB | 20130429 | LSAS | AS    | ASSIGNMENT  | PARTYTYPE : OWNER<br>OWNER : JPMORGAN CHASE BANK, N.A., NEW YORK<br>OLDPARTY : SECURITY AGREEMENT; ASSIGNOR:MOMENTIVE PERFORMANCE MATERIALS INC.; REEL/FRAME:030311/0343 EFFECTIVE DATE : 20130424                                                                                                                                         |
| US7420143 BB | 20141027 | LSAS | AS    | ASSIGNMENT  | PARTYTYPE : OWNER<br>OWNER : THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., A<br>OLDPARTY : SECURITY INTEREST; ASSIGNOR:MOMENTIVE PERFORMANCE MATERIALS INC.; REEL/FRAME:034066/0662 EFFECTIVE DATE : 20141024                                                                                                                           |
| US7420143 BB | 20141027 | LSAS | AS    | ASSIGNMENT  | PARTYTYPE : OWNER<br>OWNER : THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., A<br>OLDPARTY : SECURITY INTEREST; ASSIGNOR:MOMENTIVE PERFORMANCE MATERIALS INC.; REEL/FRAME:034066/0570 EFFECTIVE DATE : 20141024                                                                                                                           |
| US7420143 BB | 20141030 | LSAS | AS    | ASSIGNMENT  | PARTYTYPE : OWNER<br>OWNER : MOMENTIVE PERFORMANCE MATERIALS INC., NEW YORK<br>OLDPARTY : TERMINATION AND RELEASE OF SECURITY INTEREST IN PATENT RIGHTS; ASSIGNOR:THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A.; REEL/FRAME:034113/0331 EFFECTIVE DATE : 20141024                                                                        |
| US7420143 BB | 20141030 | LSAS | AS    | ASSIGNMENT  | PARTYTYPE : OWNER<br>OWNER : MOMENTIVE PERFORMANCE MATERIALS INC., NEW YORK<br>OLDPARTY : TERMINATION AND RELEASE OF SECURITY INTEREST IN PATENT RIGHTS; ASSIGNOR:THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A.; REEL/FRAME:034113/0252 EFFECTIVE DATE : 20141024                                                                        |
| US7420143 BB | 20150306 | LSAS | AS    | ASSIGNMENT  | PARTYTYPE : OWNER<br>OWNER : BOKF, NA, AS SUCCESSOR COLLATERAL AGENT, OKLAHOMA<br>OLDPARTY : NOTICE OF CHANGE OF COLLATERAL AGENT - ASSIGNMENT OF SECURITY INTEREST IN INTELLECTUAL PROPERTY; ASSIGNOR:THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A. AS COLLATERAL AGENT; REEL/FRAME:035136/0457 EFFECTIVE DATE : 20150302               |
| US7420143 BB | 20150306 | LSAS | AS    | ASSIGNMENT  | PARTYTYPE : OWNER<br>OWNER : BOKF, NA, AS SUCCESSOR COLLATERAL AGENT, OKLAHOMA<br>OLDPARTY : NOTICE OF CHANGE OF COLLATERAL AGENT - ASSIGNMENT OF SECURITY INTEREST IN INTELLECTUAL PROPERTY - SECOND LIEN; ASSIGNOR:THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A. AS COLLATERAL AGENT; REEL/FRAME:035137/0263 EFFECTIVE DATE : 20150302 |
| US7420143 BB | 20160302 | LSFE | +FPAY | FEE PAYMENT | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                                                                                                                    |
| US7420143 BB | 20190515 | LSAS | AS    | ASSIGNMENT  | PARTYTYPE : OWNER<br>OWNER : MOMENTIVE PERFORMANCE MATERIALS INC., NEW YORK<br>OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:BOKF, NA; REEL/FRAME:049194/0085 EFFECTIVE DATE : 20190515                                                                                                                                                    |
| US7420143 BB | 20190515 | LSAS | AS    | ASSIGNMENT  | PARTYTYPE : OWNER<br>OWNER : MOMENTIVE PERFORMANCE MATERIALS INC., NEW YORK                                                                                                                                                                                                                                                                |

|              |          |      |    |                                              |                                                                                                                                                                                                                                                                       |
|--------------|----------|------|----|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |    |                                              | OLDPARTY : RELEASE BY SECURED PARTY; ASSIGNOR:BOKF, NA; REEL/FRAME:049249/0271 EFFECTIVE DATE : 20190515                                                                                                                                                              |
| US7420143 BB | 20190605 | LSAS | AS | ASSIGNMENT                                   | PARTYTYPE : OWNER<br>OWNER : BNP PARIBAS, AS ADMINISTRATIVE AGENT, NEW YORK<br>OLDPARTY : FIRST LIEN TERM LOAN PATENT AGREEMENT;<br>ASSIGNOR:MOMENTIVE PERFORMANCE MATERIALS INC.;<br>REEL/FRAME:049387/0782<br>EFFECTIVE DATE : 20190515                             |
| US7420143 BB | 20190605 | LSAS | AS | ASSIGNMENT                                   | PARTYTYPE : OWNER<br>OWNER : KOOKMIN BANK, NEW YORK BRANCH, AS ADMINISTRATIVE A<br>OLDPARTY : SECOND LIEN TERM LOAN PATENT AGREEMENT;<br>ASSIGNOR:MOMENTIVE PERFORMANCE MATERIALS INC.;<br>REEL/FRAME:049388/0220<br>EFFECTIVE DATE : 20190515                        |
| US7420143 BB | 20190605 | LSAS | AS | ASSIGNMENT                                   | PARTYTYPE : OWNER<br>OWNER : CITIBANK, N.A., AS ADMINISTRATIVE AGENT, NEW YORK<br>OLDPARTY : ABL PATENT AGREEMENT;<br>ASSIGNORS:MOMENTIVE PERFORMANCE MATERIALS INC.;<br>MOMENTIVE PERFORMANCE MATERIALS GMBH;<br>REEL/FRAME:049388/0252<br>EFFECTIVE DATE : 20190515 |
| US7420143 BB | 20270503 | PEXP |    | Calculated Patent Term Expiry (PTA 203 days) |                                                                                                                                                                                                                                                                       |

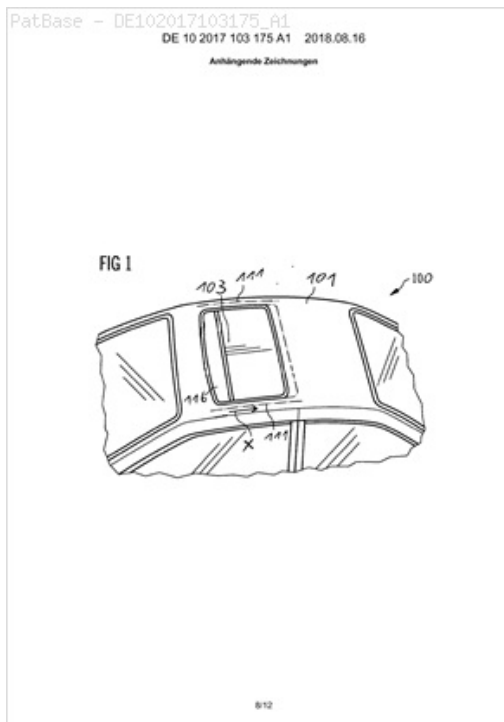
**Title:** HALTEANORDNUNG FÜR EIN ROLLO FÜR EIN FAHRZEUGDACH, ROLLOSYSTEM SOWIE VERFAHREN ZUM HERSTELLEN EINER HALTEANORDNUNG FÜR EIN ROLLO

**Abstract:** Source: DE102017103175A1 [DE] Eine Halteanordnung für ein Rollo (103) für ein Fahrzeugdach (101) weist auf:- ein Lagerelement (104) zum Halten einer Rollwelle (105) des Rollos (103),- ein Führungselement (106) zum Führen eines Randbereichs (107) des Rollos (103), wobei das Lagerelement (104) und das Führungselement (106) separat zueinander hergestellte Bauteile sind,- eine Schweissverbindung (108), die das Lagerelement (104) und das Führungselement (106) miteinander verbindet.

**Classifications:**

**International (IPC 8-9):** B60J1/20 B60J7/00 B60J7/02 B60J7/043 E06B9/50 (Advanced/Invention)

**CPC:** B60J7/0015 B60J1/2063



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN108437763 A      | 20180824         | CN201810153215     | 20180209         |
| DE102017103175 A1  | 20180816         | DE201710103175     | 20170216         |

**Priority:**

DE201710103175 20170216

**Probable Assignee:** WEBASTO SE

**Assignee(s):** (std): WEBASTO SE

**Inventor(s):** (std): VASILE MARIUS ALBAN ; ALBAN VASILE MARIUS

**Legal status (INPADOC)**

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| Patent            | Date recorded | Event group | Code  | Event                                 | Details |
|-------------------|---------------|-------------|-------|---------------------------------------|---------|
| CN108437763 A     | 20180824      | LSPB        | +     | published / reissued                  |         |
| CN108437763 A     | 20180824      | LSPB        | PB01  | PUBLICATION                           |         |
| DE102017103175 A1 | 20180816      | LSPB        | +     | published / reissued                  |         |
| DE102017103175 A1 | 20170216      | LSES        | +R012 | REQUEST FOR EXAMINATION VALIDLY FILED |         |
| DE102017103175 A1 | 20180328      | LSES        | R016  | RESPONSE TO EXAMINATION COMMUNICATION |         |

**Title:** APPARATUS FOR SHIELDING MOTEN METAL FROM HOT POT

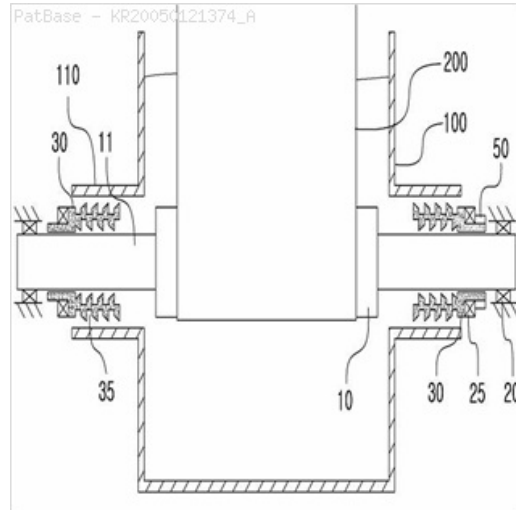
**Abstract:** Source: KR101090821B **Machine translation:** The present invention relates to a shield that prevents the **molten** metal is filled with the plating bath of the side wall and the **molten** metal is flowing out of the gap between the **roll shaft** passing through the plating bath, rotatably coupled to the roll-axis side circumference Located in the gap in the state, the sleeve having a groove on the inner surface and outer surface, and by rotating the sleeve comprises a power unit that prevents the **molten** metal is flowing out of the gap. The roller axis shield plating bath of the present invention made as described above is able to effectively block the **molten** metal to become discharged in accordance with the roll around the axis.

**Classifications:**

**International (IPC 8-9):** C23C2/00 (Advanced/Invention);  
C23C2/00 (Advanced/Non-invention);  
C23C2/00 (Core/Invention)

**International (IPC 1-7):** C23C2/00

**CPC:** C23C2/003 B05C3/132 C23C2/30 C23C2/40



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| KR101090821 B1     | 20111208         | KR20040046485      | 20040622         |
| KR20050121374 A    | 20051227         | KR20040046485      | 20040622         |

**Priority:**

KR20040046485 20040622

**Probable Assignee:** POSCO

**Assignee(s):** (std): POHANG IRON AND STEEL CO ; POSCO

**Inventor(s):** (std): SHIN HYEON JONG ; KIM SANG JOON

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                             | Details                                            |
|-----------------|---------------|-------------|-------|---------------------------------------------------|----------------------------------------------------|
| KR101090821 B1  | 20111208      | LSGT        | +     | granted / extensions (spc, cpc, pte)              |                                                    |
| KR101090821 B1  | 20141201      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20141202<br>YEAR OF FEE PAYMENT : 4 |
| KR101090821 B1  | 20161122      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20161123<br>YEAR OF FEE PAYMENT : 6 |
| KR101090821 B1  | 20171128      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20171129<br>YEAR OF FEE PAYMENT : 7 |
| KR101090821 B1  | 20240622      | PEXP        |       | Calculated Patent Term Expiry                     |                                                    |
| KR20050121374 A | 20051227      | LSPB        | +     | published / reissued                              |                                                    |
| KR20050121374 A | 20090622      | LSSES       | A201  | REQUEST FOR EXAMINATION                           |                                                    |
| KR20050121374 A | 20110516      | LSSES       | -E902 | NOTIFICATION OF REASON FOR REFUSAL                |                                                    |
| KR20050121374 A | 20111121      | LSGT        | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT |                                                    |
| KR20050121374 A | 20111201      | LSGT        | +GRNT | WRITTEN DECISION TO GRANT                         |                                                    |

**Title:** BEARING SEALS AND BEARING AND SEAL ASSEMBLIES

**Abstract:** A bearing seal suitable for sealing a bearing system (18) under extremely abrasive and damp conditions. The seal assembly (22) includes a metal casing (36) received in a housing (26) which defines a small annular gap (34) relative to a shaft (16) supported by the bearing system (18). The seal assembly (22) includes a first seal (42) and a second seal (48) spaced apart to define an annular space (60). The assembly (22) is provided with a plurality of passages (64/66) circumferentially spaced apart from one another. Upon pumping grease (76) under pressure into the bearing system, grease is forced to flow through the passages (64/66) whereby the annular gap (34) is filled with grease throughout substantially the entire circumference thereof. The mass of grease retained in the annular gap (34) serves as a barrier against water and abrasive particles. A bearing and seal assembly (10) is also disclosed.

**Classifications:**

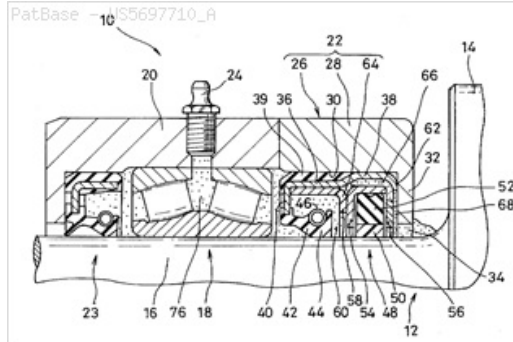
**International (IPC 8-9):** B21B31/07 B22D11/128 F16C33/76 F16C33/78 F16J15/00 F16J15/16 F16J15/32 (Advanced/Invention); B21B31/00 B22D11/128 F16C33/76 F16J15/00 F16J15/16 F16J15/32 (Core/Invention)

**International (IPC 1-7):** B22D11/128 F16C33/72 F16C33/78 F16J15/32

**CPC:** F16C33/7896 F16C33/805 F16J15/3252 B21B31/078 F16C33/6622 F16J15/002 F16J15/164 F16C2322/12 F16C19/38 F16C23/086

**European:** F16C33/78

**US:** 384/473 384/474 384/477 384/484 384/488

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN1068100 C        | 20010704         | CN19961019220      | 19961019         |
| CN1155633 A        | 19970730         | CN19961019220      | 19961019         |
| JP2004263876 A2    | 20040924         | JP20040118805      | 20040414         |
| JP3845483 B2       | 20061115         | JP19960297674      | 19961018         |
| JP3941792 B2       | 20070704         | JP20040118805      | 19961018         |
| JP9170663 A2       | 19970630         | JP19960297674      | 19961018         |
| US5697710 A        | 19971216         | US19960733764      | 19961018         |

**Priority:**

JP19950297849 19951020 JP19960297674 19961018 JP20040118805 20040414

**Probable Assignee:** NOK CORP

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

**Inventor(s):** (std): IIDA YOSHIMI ; KAWABATA HIDEO

**Inventor(s):** YOSHIMI IIDA ; HIDEO KAWABATA

**Agent(s):** SERA KAZUNOBU; WAKUTA JUN ICHI

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                                          | Details                                                              |
|-----------------|---------------|-------------|-------|----------------------------------------------------------------|----------------------------------------------------------------------|
| CN1068100 C     | 20010704      | LSGT        | +     | granted / extensions (spc, cpc, pte)                           |                                                                      |
| CN1068100 C     | 19970730      | LSPB        | +C06  | PUBLICATION                                                    |                                                                      |
| CN1068100 C     | 20010704      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL                               |                                                                      |
| CN1068100 C     | 20161123      | LSWD        | -EXPY | TERMINATION OF PATENT RIGHT OR UTILITY MODEL                   |                                                                      |
| CN1068100 C     | 20161019      | PEXP        |       | Calculated Patent Term Expiry                                  |                                                                      |
| CN1155633 A     | 19970730      | LSPB        | +     | published / reissued                                           |                                                                      |
| JP2004263876 A2 | 20040924      | LSPB        | +     | published / reissued                                           |                                                                      |
| JP3845483 B2    | 20061115      | LSGT        | +     | granted / extensions (spc, cpc, pte)                           |                                                                      |
| JP3845483 B2    | 20040218      | LSRV        | -A02  | DECISION OF REFUSAL                                            | TEXT : JAPANESE INTERMEDIATE CODE: A02<br>EFFECTIVE DATE : 20040217  |
| JP3845483 B2    | 20040416      | LSRE        | A521  | WRITTEN AMENDMENT                                              | TEXT : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20040415 |
| JP3845483 B2    | 20040423      | LSAL        | A911  | TRANSFER OF RECONSIDERATION BY EXAMINER BEFORE APPEAL (ZENCHI) | TEXT : JAPANESE INTERMEDIATE CODE: A911<br>EFFECTIVE DATE : 20040422 |
| JP3845483 B2    | 20040524      | LSAL        | -A912 | REMOVAL OF RECONSIDERATION                                     | TEXT : JAPANESE INTERMEDIATE CODE: A912                              |

|              |          |      |       |                                                                               |                                                                      |
|--------------|----------|------|-------|-------------------------------------------------------------------------------|----------------------------------------------------------------------|
|              |          |      |       | BY EXAMINER BEFORE APPEAL (ZENCHI)                                            | EFFECTIVE DATE : 20040521                                            |
| JP3845483 B2 | 20060727 | LSGT | +A01  | 特許査定書 (Decision of patent grant)                                              |                                                                      |
| JP3845483 B2 | 20060822 | LSFE | R100  | 特許料納付書 (Patent fee payment form)                                              |                                                                      |
| JP3845483 B2 | 20060824 | LSFE | +A61  | FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)                         | TEXT : JAPANESE INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20060821  |
| JP3845483 B2 | 20060825 | LSGT | +R150 | CERTIFICATE OF PATENT OR REGISTRATION OF UTILITY MODEL                        | TEXT : JAPANESE INTERMEDIATE CODE: R150                              |
| JP3845483 B2 | 20090723 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                              |                                                                      |
| JP3845483 B2 | 20090728 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                  | YEAR OF FEE PAYMENT : 4                                              |
| JP3845483 B2 | 20100722 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                  | YEAR OF FEE PAYMENT : 4                                              |
| JP3845483 B2 | 20100907 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                  | YEAR OF FEE PAYMENT : 5                                              |
| JP3845483 B2 | 20110721 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                              |                                                                      |
| JP3845483 B2 | 20110726 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                  | YEAR OF FEE PAYMENT : 6                                              |
| JP3845483 B2 | 20120712 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                  | YEAR OF FEE PAYMENT : 6                                              |
| JP3845483 B2 | 20120717 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)                  | YEAR OF FEE PAYMENT : 7                                              |
| JP3845483 B2 | 20130718 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                              |                                                                      |
| JP3845483 B2 | 20130723 | LSFE | R2501 | 年金領収書 (一括) (Pension receipt (bulk))                                           |                                                                      |
| JP3845483 B2 | 20140717 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                              |                                                                      |
| JP3845483 B2 | 20140722 | LSFE | R2501 | 年金領収書 (一括) (Pension receipt (bulk))                                           |                                                                      |
| JP3845483 B2 | 20150723 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                                              |                                                                      |
| JP3845483 B2 | 20150728 | LSFE | R2501 | 年金領収書 (一括) (Pension receipt (bulk))                                           |                                                                      |
| JP3845483 B2 | 20160825 | LSLE | -LAPS | CANCELLATION BECAUSE OF NO PAYMENT OF ANNUAL FEES                             |                                                                      |
| JP3845483 B2 | 20161018 | PEXP |       | Calculated Patent Term Expiry                                                 |                                                                      |
| JP3941792 B2 | 20070704 | LSGT | +     | granted / extensions (spc, cpc, pte)                                          |                                                                      |
| JP3941792 B2 | 20061122 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                           | TEXT : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20061121 |
| JP3941792 B2 | 20070113 | LSRE | A521  | WRITTEN AMENDMENT                                                             | TEXT : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20070112 |
| JP3941792 B2 | 20070307 | LSGT | +TRDD | DECISION OF GRANT OR REJECTION WRITTEN                                        |                                                                      |
| JP3941792 B2 | 20070314 | LSGT | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | TEXT : JAPANESE INTERMEDIATE CODE: A01<br>EFFECTIVE DATE : 20070313  |
| JP3941792 B2 | 20070315 | LSGT | +A01  | 特許査定書 (Decision of patent grant)                                              |                                                                      |

|              |          |      |       |                                                                |                                                                                                                                                                                                            |
|--------------|----------|------|-------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP3941792 B2 | 20070315 | LSFE | R1001 | 特許料納付書 (包括納付)<br>(Patent fee payment form (inclusive payment)) |                                                                                                                                                                                                            |
| JP3941792 B2 | 20070412 | LSFE | +A61  | FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)          | TEXT : JAPANESE INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20070326                                                                                                                                        |
| JP3941792 B2 | 20070413 | LSGT | +R150 | CERTIFICATE OF PATENT OR REGISTRATION OF UTILITY MODEL         | TEXT : JAPANESE INTERMEDIATE CODE: R150                                                                                                                                                                    |
| JP3941792 B2 | 20100311 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)   | YEAR OF FEE PAYMENT : 3                                                                                                                                                                                    |
| JP3941792 B2 | 20100316 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)   | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                    |
| JP3941792 B2 | 20110310 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                               |                                                                                                                                                                                                            |
| JP3941792 B2 | 20110315 | LSFE | R2501 | 年金領収書 (一括)<br>(Pension receipt (bulk))                         |                                                                                                                                                                                                            |
| JP3941792 B2 | 20120308 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                               |                                                                                                                                                                                                            |
| JP3941792 B2 | 20120313 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)   | YEAR OF FEE PAYMENT : 6                                                                                                                                                                                    |
| JP3941792 B2 | 20130314 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)   | YEAR OF FEE PAYMENT : 6                                                                                                                                                                                    |
| JP3941792 B2 | 20130319 | LSFE | +FPAY | RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)   | YEAR OF FEE PAYMENT : 7                                                                                                                                                                                    |
| JP3941792 B2 | 20140313 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                               |                                                                                                                                                                                                            |
| JP3941792 B2 | 20140318 | LSFE | R2501 | 年金領収書 (一括)<br>(Pension receipt (bulk))                         |                                                                                                                                                                                                            |
| JP3941792 B2 | 20150312 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                               |                                                                                                                                                                                                            |
| JP3941792 B2 | 20150317 | LSFE | R2501 | 年金領収書 (一括)<br>(Pension receipt (bulk))                         |                                                                                                                                                                                                            |
| JP3941792 B2 | 20160407 | LSFE | R20   | 特許料納付書 (Patent fee payment form)                               |                                                                                                                                                                                                            |
| JP3941792 B2 | 20161018 | LSLE | -EXPY | CANCELLATION BECAUSE OF COMPLETION OF TERM                     |                                                                                                                                                                                                            |
| JP3941792 B2 | 20240414 | PEXP |       | Calculated Patent Term Expiry                                  |                                                                                                                                                                                                            |
| JP9170663 A2 | 19970630 | LSPB | +     | published / reissued                                           |                                                                                                                                                                                                            |
| US5697710 A  | 19971216 | LSGT | +     | granted / extensions (spc, cpc, pte)                           |                                                                                                                                                                                                            |
| US5697710 A  | 19970130 | LSAS | AS    | ASSIGNMENT                                                     | PARTYTYPE : OWNER<br>OWNER : NOK CORPORATION, JAPAN<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:IIDA, YOSHIMI;<br>KAWABATA, HIDEO;<br>REEL/FRAME:008326/0939<br>EFFECTIVE DATE : 19961008 |
| US5697710 A  | 19971110 | LSGT | PAT1  | Patented Case                                                  |                                                                                                                                                                                                            |
| US5697710 A  | 19971110 | LSGT | STCF  | INFORMATION ON STATUS: PATENT GRANT                            | TEXT : PATENTED CASE                                                                                                                                                                                       |
| US5697710 A  | 20010524 | LSFE | +FPAY | FEE PAYMENT                                                    | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                    |
| US5697710 A  | 20050517 | LSFE | +FPAY | FEE PAYMENT                                                    | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                    |
| US5697710 A  | 20090520 | LSFE | +FPAY | FEE PAYMENT                                                    | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                   |
| US5697710 A  | 20161018 | PEXP |       | Calculated Patent Term Expiry                                  |                                                                                                                                                                                                            |

