

Diego Gonzalez

1) Family number: 32323905 (US2005234276A)

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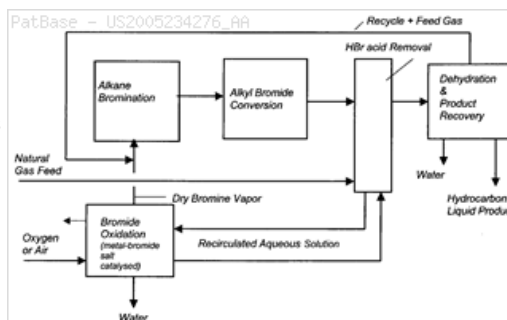
Title: PROCESS FOR CONVERTING GASEOUS ALKANES TO LIQUID HYDROCARBONS

**Abstract:** A process for converting gaseous alkanes to liquid hydrocarbons wherein a gaseous feed containing alkanes is reacted with a dry bromine vapor to form alkyl bromides and hydrobromic acid vapor. The mixture of alkyl bromides and hydrobromic acid are then reacted over a synthetic crystalline alumino-silicate catalyst, such as a ZSM-5 zeolite, at a temperature of from about 150 degrees centigrade to about 400 degrees centigrade so as to form higher molecular weight hydrocarbons and hydrobromic acid vapor. Hydrobromic acid vapor is removed from the higher molecular weight hydrocarbons. A portion of the propane and butane is removed from the higher molecular weight hydrocarbons and reacted with the mixture of alkyl bromides and hydrobromic acid over the synthetic crystalline alumino-silicate catalyst to form C<sub>5</sub> + hydrocarbons.

**Classifications:**

**International (IPC 8-9):** B01J19/00 B01J23/42 B01J29/08 C01B7/09 C01B9/04 C07B37/04 C07B61/00 C07C1/00 C07C1/20 C07C1/26 C07C1/30 C07C1/32 C07C15/00 C07C15/02 C07C17/007 C07C17/013 C07C17/07 C07C17/093 C07C17/10 C07C17/25 C07C17/35 C07C17/37 C07C19/075 C07C2/00 C07C2/02 C07C2/88 C07C5/00 C07C5/44 C07C7/148 C07C9/00 C07C9/08 C07C9/10 C07C9/14 C07H21/04 C09K3/00 C10G29/20 C10G29/26 C10G3/00 C10G50/00 C10G50/02 C10L1/04 C10L1/06 C12N1/20 C12N15/00 (Advanced/Invention); B01J23/42 C07B61/00 C07C1/20 C07C15/00 C07C17/013 C07C17/093 C07C17/25 C07C19/075 C07C2/00 (Advanced/Non-invention); B01J21/12 B01J29/00 C01B7/00 C01B9/00 C07B37/00 C07B61/00 C07C1/00 C07C15/00 C07C17/00 C07C19/00 C07C2/00 C07C5/00 C07C6/08 C07C9/00 C07H21/00 C09K3/00 C10G3/00 C10G50/00 C12N1/20 C12N15/00 (Core/Invention); C07B61/00 (Core/Non-invention); C07C (Subclass/Invention)

**International (IPC 1-7):** B01J21/12 C01B7/09 C01B7/09 C07C1/00 C07C1/20 C07C15/00 C07C2/00 C07C2/02 C07C6/08 C07C19/075 C10G29/02 C10G29/20B C10G29/26 C10G3/00 C10G50/00 C10G50/02 C10L3/10 C10L3/10B2 L01J208/00C2D4L L01J208/02D2B L01J219/00A2B L01J219/00A6J L01J219/00A6L L01J219/00R10H L01J219/00R10J L01J219/00R12 L01J219/00R2 L01J219/00R6D6 L01J219/00R8B L01J219/00R8D L01J219/00R8F L01J219/00R8R L01J29/40 M07C529/08 M07C529/40 M10G300/10D M10G300/10L M10G400/20 M10G400/22  
**US:** 1/1 252/182.3 252/182.300S 422/603 422/603S 422/630 422/630S 423/491 423/491P 423/491S 423/500 423/500S 44/300 570/244 570/252 570/252P 570/252S 570/253 570/253S 570/254 570/254P 585/14 585/16 585/18 585/18P 585/19 585/19S 585/24 585/310 585/310P 585/324 585/324P 585/324S 585/359 585/408 585/422 585/469 585/603 585/641 585/641S 585/642 585/642P 585/649 585/733 585/733S 585/833 585/833S



Family:

| Publication number | Publication date | Application number | Application date |
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#### Priority:

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| US20140255549  | 20140417 |                |          |               |          |

**Probable Assignee:** GTC TECHNOLOGY US LLC

**Assignee(s):** (std): BRICKEY RAYMOND T ; GTC TECHNOLOGY US LLC ; LISEWSKY GREG A ; MARATHAN OIL CO ; MARATHAN OIL COMPANY ; WAYCULIS JOHN J ; MARATHON OIL CO ; MARATHON GTF TECHNOLOGY LTD ; TURNER WILLIAM J ; THOMAS RAPHAEL ; YORK STEPHEN D ; MARATHON GTF TECHNOLOGY LTD ; MARATHON GTF TECH LTD

**Assignee(s):** MARATHON GTF TECHNOLOGY LTD5555 SAN FELIPEHOUSTONTX77056-2799US ; MARATHON OIL CO5555 SAN FELIPEHOUSTONTX77056US ; MARATHON OIL COMPANY ; GTC TECHNOLOGY US LLC500-1001 S. DAIRY ASHFORDHOUSTONTX77077US ; GTC TECHNOLOGY LP

**Inventor(s):** (std): WAYCULIS JOHN J ; BRICKEY RAYMOND T ; LISEWSKY GREG A ; YORK STEPHEN D ; RAPHAEL THOMAS ; TURNER WILLIAM J ; TURNER WILLIAM WILSON ; THOMAS RAPHAEL

**Inventor(s):** JOHN J WAYCULIS ; WILLIAM J TURNER ; WAYCULIS JOHN JUS ; WAYCULIS JOHN

**Agent(s):** DAVIES COLLISON CAVE; DAVIES COLLISON CAVE PTY LTD; MACRAE AND CO; LUZ CLEMENCIA DE PAEZ; MALLALIEU CATHERINE LOUISE ET AL; MALLALIEU CATHERINE LOUISE; LAW OFFICE OF JACK E EBEL; MARATHON OIL CO C O LAW OFFICE OF JACK E EBEL; EBEL JACK E; JACK E; RODNEY F; COREY S; TUMEY LLP

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

## 2) Family number: 42936538 (US2010324801A)

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**Title:** SYSTEM FOR SUPPLY OF LPG/AMMONIA FOR DIRECT-INJECTION PETROL OR DIESEL ENGINES

**Abstract:** A system for supply of LPG/ammonia for direct-injection petrol or diesel engines comprises, in combination: an electronic control unit for regulation and control of the strategies (1); a petrol/diesel tank provided on the vehicle (2); a petrol/diesel pump provided on the vehicle (3); one or more supplementary petrol/diesel pumps (4); a petrol/diesel-delivery solenoid valve (5); a petrol/diesel non-return valve (6); an original high-pressure pump of the vehicle (7); an LPG/ammonia pressure regulator (8); an LPG/ammonia-return valve (9); an additional radiator with cooling fan (10); an LPG/ammonia non-return valve (11); an LPG/ammonia tank (12); an LPG/ammonia pump (13); an LPG/ammonia-delivery solenoid valve (14); an LPG/ammonia non-return valve (15); a supplementary LPG/ammonia injector (16); original high-pressure injector rail (17) of the vehicle; an adapter (19) connected to the high-pressure pump (7), which enables circulation and return of the LPG/ammonia to the tank; an original electronic control unit (20) of the vehicle; and a distribution assembly with solenoid valves and/or non-return valves (21), which combines the devices for opening the passage for delivery and return of the LPG/ammonia in the liquid phase, and vice versa, in which with modalities, succession, and times pre-set according to the modalities of operation of the engine with LPG/ammonia or petrol/diesel fuelling, switching of operation of the engine with LPG/ammonia fuelling or petrol/diesel fuelling, arrest of the engine, and modalities requested by the driver, the control unit (1) governs: the petrol/diesel pump (3); the supplementary petrol/diesel pump (4); the petrol/diesel-delivery solenoid valve (5); the LPG/ammonia-return solenoid valve (9); the LPG/ammonia pump (13); the LPG/ammonia-delivery solenoid valve (14); the LPG/ammonia injector (16); a valve for discharge of the LPG/ammonia overpressure (26); a supplementary LPG/ammonia pump (27); and the non-return valves (24), (25) and (28).

#### Classifications:

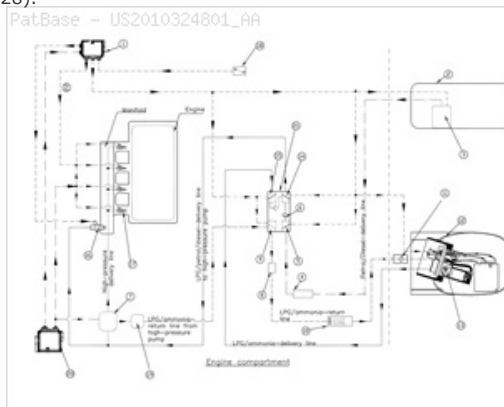
**International (IPC 8-9):** F02B43/00 F02B43/10 F02B47/04 F02D19/06 F02D19/08 F02D19/10 F02D41/00 F02M21/02 F02M43/00 (Advanced/Invention); F02D41/38 F02M37/00 (Advanced/Non-invention); F02B43/00 F02D19/00 F02D41/00 F02D43/00 F02M21/00 F02M21/02 (Core/Invention)

**International (IPC 1-7):** F02D41/00

**CPC:** F02D19/0647 F02D19/0684 Y02T10/36 F02D41/0025 F02B43/10 F02B2275/14 F02D19/066 F02D19/10 F02D2041/389 F02M21/0215 F02M37/0088 Y02T10/123 Y02T10/32 F02D19/0615 F02D19/0644 F02D19/0692 F02D19/0694 F02D19/085

**European:** F02B43/10 F02D19/06R F02D19/10 F02D41/00F F02M21/02 F02M21/02F6 F02M37/00L4 R02B275/14 R02D41/38D R02M37/00T4

**US:** 123/1.00A 123/1A 123/304 123/525 123/526 701/103 701/103P 701/104



**Family:**

| Publication number | Publication date | Application number | Application date |
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**Priority:**

IT2008RM00065 20080206 EP20090707159 20090205 US20090526215 20090205  
US20090845487 20090205 US20090492989 20090205 WO2009IT00036 20090205  
US20130845487 20130318

**Probable Assignee:** ICOMET SPA**Assignee(s):** (std): CIPPITANI LUCIANO ; ICOMET S P A ; ICOMET SPA**Inventor(s):** (std): CIPPITANI LUCIANO ; LUCIANO CIPPITANI**Agent(s):** WRAYS; NORTON ROSE FULBRIGHT CANADA LLP SENCRL SRL; ISARPATENT PATENTANWAELTE  
BEHNISCH BARTH CHARLES HASSA PECKMANN AND PARTNER MBB; SARPI MAURIZIO; MORGADES  
JUAN ANTONIO; YOUNG AND THOMPSON**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI 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 PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV  
SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW**3) Family number: 48345270 (US2012150418A)**

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**Title:** APPARATUS AND METHOD FOR CONTROLLING FUEL INJECTION IN A BI-FUEL VEHICLE RUNNING ON TWO FUELS, I.E. GASOLINE AND LPG

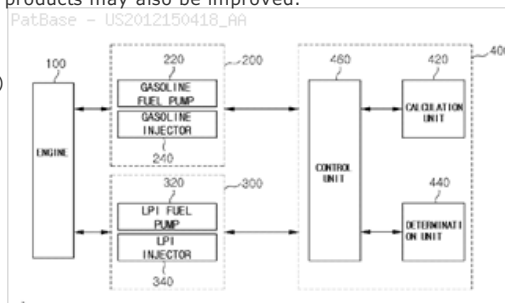
**Abstract:** A method of controlling fuel injection of a bi-fuel vehicle running on gasoline and liquefied petroleum gas (LPG), and more particularly, a method of controlling fuel injection of a bi-fuel vehicle having an engine running on gasoline and LPG, capable of simultaneously controlling supply systems and injectors of fuels and switching the fuels in response to a fuel switch request based on an injection ratio and an injection time of each fuel is provided. Thus, fuels may be switched stably and efficiently, output reduction and exhaust gas increase due to deviation of an air-fuel ratio while switching fuels may be prevented, and fuels may be appropriately switched. Furthermore, mechanical stress generated while switching fuels may be minimized and stable driving may be provided. Accordingly, the reliability of a bi-fuel vehicle simultaneously using gasoline and LPG may be improved and the competitiveness of bi-fuel vehicle products may also be improved.

**Classifications:**

**International (IPC 8-9):** F02D19/06 F02D19/08 F02D41/00  
F02D41/04 F02D41/30 F02M21/02 (Advanced/Invention);  
F02D19/06 F02D41/04 F02D41/30 F02M21/02 (Advanced/Non-invention)  
**CPC:** F02D41/0025 F02D19/061 F02D19/0613 F02D19/0647  
F02D19/0692 F02D19/081 F02D2250/21 F02M21/0287 Y02T10/32  
Y02T10/36

**European:** F02D19/08 F02D19/08C F02D41/00F F02M21/02S14  
R02D250/21

**US:** 1/1 701/103 701/103S 701/104 701/104P

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE602010025103 D1  | 20150716         | DE201060025103T    | 20100729         |
| EP2469058 A2       | 20120627         | EP20100810101      | 20100729         |
| EP2469058 A4       | 20140319         | EP20100810101      | 20100729         |
| EP2469058 B1       | 20150603         | EP20100810101      | 20100729         |
| IN01019DN2012 A    | 20121019         | IN2012DN01019      | 20120203         |
| IN310856 B         | 20190412         | IN2012DN01019      | 20120203         |
| KR101079865 B1     | 20111103         | KR20090076629      | 20090819         |
| KR20110019060 A    | 20110225         | KR20090076629      | 20090819         |
| US2012150418 AA    | 20120614         | US20100391259      | 20100729         |
| US9046049 BB       | 20150602         | US20100391259      | 20100729         |

|               |          |               |          |
|---------------|----------|---------------|----------|
| WO11021793 A2 | 20110224 | WO2010KR05007 | 20100729 |
| WO11021793 A3 | 20110603 | WO2010KR05007 | 20100729 |

**Priority:**

KR20090076629 20090819 EP20100810101 20100729 WO2010KR05007 20100729

**Probable Assignee:** KEFICO CORP

**Assignee(s):** (std): CHOI HU RAK ; JEON BYUNG CHUN ; KANG JI WON ; KEFICO CO LTD ; KEFICO CORP

**Assignee(s):** KEFICO CORP GUNPO SI

**Inventor(s):** (std): JEON BYUNG CHUN ; KANG JI WON ; CHOI HU RAK

**Agent(s):** SCHOPPE ZIMMERMANN STOECKELER ZINKLER SCHENK AND PARTNER MBB PATENTANWALTE;  
STOECKELER FERDINAND; KNOBBE MARTENS OLSON AND BEAR LLP; KIM WON SIK

**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 KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW  
MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV  
SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

**4) Family number: 40782880 (US2009312935A)**

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**Title:** METHOD AND APPARATUS FOR SUPPLYING FUEL OF LPG CAR HAVING LPI SYSTEM

**Abstract:** Disclosed is method and apparatus for supplying fuel of LPG car having LPI system. More particularly, the present invention generates a gas fuel injection signal based on a gasoline fuel injection signal and directly injects LPG fuel within a fuel tank to a combustion chamber using the generated gas fuel injection signal to drive an engine. Therefore, an engine can be easily changed, the manufacturing cost of a dual car of LPG and gasoline can be reduced, and the manufacturing process thereof can be simplified.

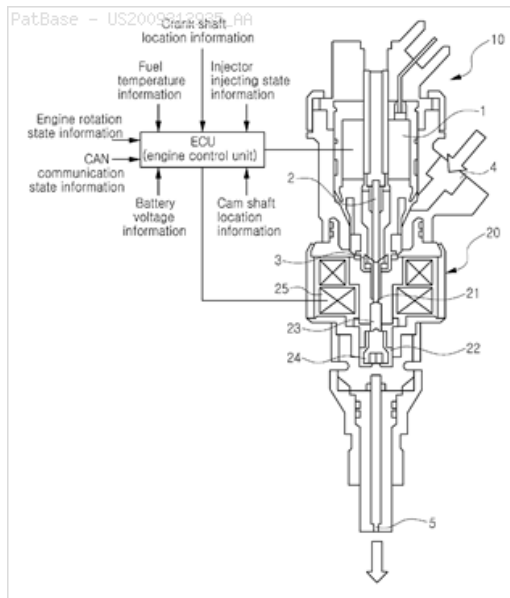
**Classifications:**

**International (IPC 8-9):** F02D19/02 F02D19/06 F02D29/02  
F02D41/00 F02D41/20 F02D41/30 F02D45/00 F02M21/00 F02M21/02  
F02M43/04 F02M51/06 F02M61/16 (Advanced/Invention);  
F02D19/02 F02D41/20 F02M21/02 F02M51/06  
F02M61/16 (Advanced/Non-invention);  
F02D19/00 F02D29/02 F02D41/20 F02D41/30 F02D45/00 F02M21/00  
F02M21/02 F02M51/06 F02M61/00 (Core/Invention)

**CPC:** F02D41/20 F02M21/0263 F02D19/024 F02M21/0254  
F02M21/0266 F02M21/0278 F02D19/061 F02D19/0628 F02D19/0647  
F02D19/0694 F02D41/0027 F02D2400/11 F02M43/04 Y02T10/36  
F02D41/34 F02D2041/202 F02M51/06 Y02T10/44 Y02T10/32  
F02M21/0242 F02M61/16

**European:** F02D19/06 F02D19/06E2 F02D41/00F2 F02D41/20  
F02M21/02 F02M21/02S10 R02D400/11 R02M43/04

**US:** 123/445 123/445S 701/103 701/103P



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU2007268402 AA    | 20071206         | AU20070268402      | 20070531         |
| AU2007268402 BB    | 20121101         | AU20070268402      | 20070531         |
| CN101506506 A      | 20090812         | CN200780026618     | 20070531         |
| CN101506506 B      | 20110615         | CN200780026618     | 20070531         |
| EP2029882 A1       | 20090304         | EP20070746793      | 20070531         |
| EP2029882 A4       | 20180404         | EP20070746793      | 20070531         |
| EP2029882 B1       | 20190522         | EP20070746793      | 20070531         |
| JP2009539022 T2    | 20091112         | JP20090513062T     | 20070531         |
| KR100725702 B1     | 20070607         | KR20060049557      | 20060601         |
| KR100749246 B1     | 20070813         | KR20060085361      | 20060905         |
| KR100756188 B1     | 20070905         | KR20060108384      | 20061103         |
| US2009312935 AA    | 20091217         | US20070303109      | 20070531         |
| US7949460 BB       | 20110524         | US20070303109      | 20070531         |
| WO07139358 A1      | 20071206         | WO2007KR02646      | 20070531         |

**Priority:**

KR20060049557 20060601 KR20060085361 20060905 KR20060106863 20061031  
KR20060107288 20061101 KR20060108384 20061103 KR20060135050 20061227  
WO2007KR02646 20070531

**Probable Assignee:** SIEMENS AUTOMOTIVE SYSTEMS CO LTD

**Assignee(s):** (std): CONTINENTAL AUTOMOTIVE SYSTEMS CO LTD ; SIEMENS AUTOMOTIVE SYSTEMS CO ; MIN YOUNG KI  
; SONG JIN WOO ; JUNG JAE MIN ; PARK YOUNG JOO ; SIEMENS AUTOMOTIVE SYSTEMS CO LTD ; AN  
JEONG HOON ; CHOO EUN SIK ; CONTINENTAL AUTOMOTIVE SYSTEMS

**Assignee(s):** CONTINENTAL AUTOMOTIVE SYSTEMS CO ; CONTINENTAL AUTOMOTIVE SYSTEMS CORP

**Inventor(s):** (std): AN JEONG HOON ; PARK YOUNG JOO ; JUNG JAE MIN ; YOUNG JOO PARK ; JEONG HOON AN ; EUN SIK  
CHOO ; JIN WOO SONG ; JAE MIN JUNG ; YOUNG KI MIN ; MIN YOUNG KI ; SONG JIN WOO ; CHOO  
EUN SIK

**Agent(s):** MADDERNS PATENT AND TRADE MARK ATTORNEYS; MADDERNS PTY LTD; MERRIFIELD SARAH

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

##### 5) Family number: 42594420 (US2010131178A)

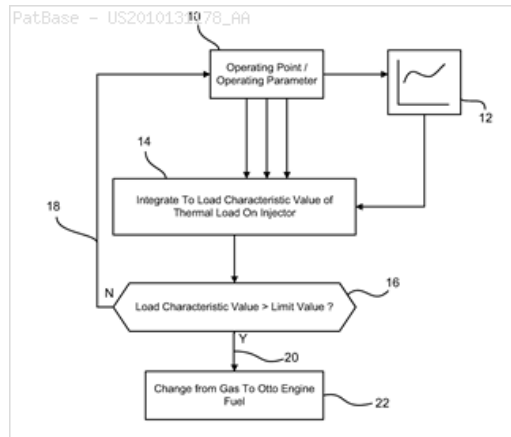
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**Title:** METHOD OF OPERATING AN INTERNAL COMBUSTION ENGINE

**Abstract:** A method relates to operating an internal combustion engine in the form of an Otto engine, especially of a motor vehicle. Otto engine fuel (i.e., carburetor fuel, spark ignition engine fuel), such as gasoline or ethanol (E85), are directly injected into at least one combustion chamber of the internal combustion engine with at least one fuel injector. Optionally, instead of injecting ignition spark engine fuel or in addition, the internal combustion engine is operated with gas, especially CNG (compressed natural gas) or LPG (liquefied petroleum gas). During operation of the internal combustion engine with gas only, the engine is automatically switched to the operation with spark ignition engine fuel for a predetermined period, or the engine is switched to the operation with spark ignition engine fuel in addition to the operation with gas, in such a manner that a predetermined quantity of the carburetor fuel flows through the at least one fuel injector. The engine is then automatically switched back to the operation with gas only.

**Classifications:**

**International (IPC 8-9):** F02B13/00 F02D19/02 F02D19/06  
F02D19/08 F02D19/10 F02D41/00 F02D45/00 (Advanced/Invention);  
F02B13/00 (Advanced/Non-invention);  
F02B13/00 F02D19/00 F02D41/00 F02D45/00 (Core/Invention)  
**CPC:** F02D41/0027 F02D19/0605 F02D19/0621 F02D19/0647  
F02D19/0689 F02D19/0694 F02D19/081 F02D19/084 Y02T10/36  
**European:** F02D19/06 F02D19/06C2 F02D19/08 F02D41/00F2  
**US:** 123/575 123/575S 701/103 701/103P



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AT513123 E         | 20110715         | AT20080735206T     | 20080412         |
| DE102007025076 A1  | 20081204         | DE200710025076     | 20070530         |
| DE502008003876 D1  | 20110728         | DE200850003876T    | 20080412         |
| EP2165063 A1       | 20100324         | EP20080735206      | 20080412         |
| EP2165063 B1       | 20110615         | EP20080735206      | 20080412         |
| RU2009149364 A     | 20110710         | RU20090149364      | 20080412         |
| RU2442903 C2       | 20120220         | RU20090149364      | 20080412         |
| US2010131178 AA    | 20100527         | US20090627561      | 20091130         |
| US7853397 BB       | 20101214         | US20090627561      | 20091130         |
| WO08145228 A1      | 20081204         | WO2008EP02922      | 20080412         |

**Priority:**

DE200710025076 20070530 EP20080735206 20080412 WO2008EP02922 20080412

**Probable Assignee:** VOLKSWAGEN GROUP

**Assignee(s):** (std): FOL KSVAGEN AKTSIENGEZELL SHAFT ; POTT EKKEHARD ; THEOBALD JOERG ; VOLKSWAGEN AG ; VOLKSWAGEN GROUP

**Assignee(s):** VOLKSWAGEN AKTIENGESELLSCHAFT

**Inventor(s):** (std): THEOBALD JOERG ; POTT EKKEHARD ; POTT EHKKEKHARD ; TEOBAL D JORG

**Inventor(s):** TEOBALD JORG

**Agent(s):** LERNER GREENBERG STEMER LLP; LAURENCE A; WERNER H; RALPH E; VOLKSWAGEN AKTIENGESELLSCHAFT

**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 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 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

##### 6) Family number: 622404 (BR8207269A)

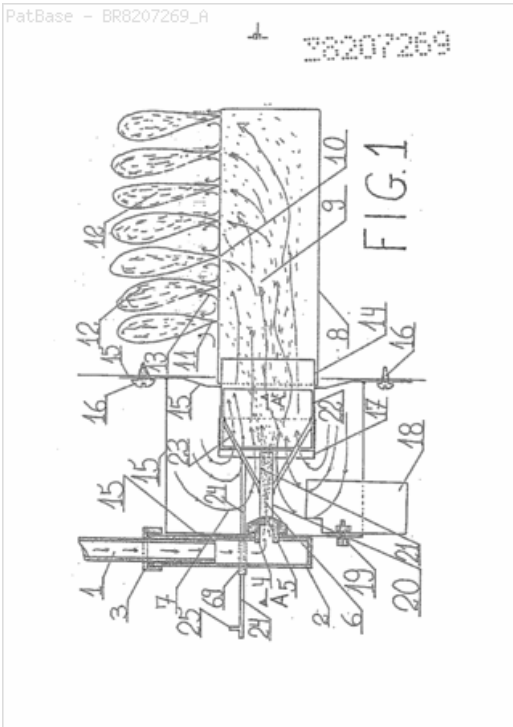
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**Title:** INTERCAMBIADOR GLP-METANO EM FORNOS HEATER LPG-METHANE IN OVENS (Machine translation)

**Abstract:** Source: BR8207269A [PT] i . # . . . . # . . . . . ss \ ss . ss . : . . . . . ftss ftss . ; ss \*\*\*\* \* » RESUMO DE INVENCAO A patente de invencao do "INTERCAMBIADOR GLP-METANO EM POFN06" refere se a dispositivos que permitem num mesmo aparelho a gas (forno,fogao, fornalha,etc) efetuar tanto a combustao de GLP quanto a combustao de "metano11 (em variaveis composicoes, como "biogas" e "gas natural"igeolo gico e sintetico) num queimador padrao adaptado para queima de GLP, e obtendo-se em ambos os casos potencias termicas equivalentes e confous tao adequada. Pelo orificio injetor,adaptado para GLP,a pressao de in jecao de "metano" e aproximadamente igual a pressao de injecao de GLP vezes a densidade relativa do "metano" ao GLP e vezes o quadrado do quociente do poder calorifico inferior volumetrico (kcal/m) do GLP - pelo correspondente do "metano", e tal pressao deve,em queimadores do mes ticos, ser inferior a 2 psig (usual e a faixa de 0,5 a 1,5 psig). De ve-se rever o projeto dos queimadores de GLP ou usar "propano",para - se ter orificios injetores de maior diametro e melhor "aeracao prima- ria" arrastada,e deve-se manter no "metano" componentes como etano,bu

tano,propano,etc,eliminando-se gases inertes como OOetc.O "INTER CAMBIADOR GLP-METANO EM F0FN06" consiste de dispositivos que se man- tem na regio de aspiracao/arraste do "ar primario",proximo ao orifi- cio in jetor de gas,e cujas paredes sao de espessura minima e rigidas, para economia de material e minima interferencia no fluxo gasoso,e in clui um "tubo dissipador" geralmente solidario a uma "haste guia"e/ou a uma "estrutura guia".Quando se queima "metano" o "tubo dissipador" deve encostar no bujao ou tanpao que contem o "furo in jetor",de sorte que o veloz jato de "metano" seja dissipado no interior do "tubo dis- sipador ",e isso se garante octn o auxilio da "haste guia" e/ou da "es- trutura guia".Para queimar GLP distancia-se ao maximo o "tubo dissipe dor" do "furo injetar" de GLP,isso ocm auxilio da "haste guia",e esta pode ser comandada manualmente ou mecanicamente (remotamente) para fi car tanto na posicao de queima de GLP ou de "metano" e similares. As- sim se pode intercanfoiar automaticamente "gases nao inter cambiaveis". **Machine translation: I** ..... ss \ ss . .:: ..... ' ft ss ft ss.;; ss ss ss ss ss ss ss» SUMMARY of INVENTION patent of invention of the "HEATER LPG-METHANE in P0FN06" refers to devices that allow a same gas appliance (furnace, stove, furnace, etc) to make both the LPG as IC IC "metano11 (compositions such as variables" biogas "and" natural gas "igeolo and insektitsidov) in a standard burner adapted for combustion of LPG, and thus in both cases potential bag equivalent and confous as appropriate. By the gun hole, adapted to LPG, the pressure in jecao of "methane" and approximately equal to LPG injection pressure times the relative density of "methane" to LPG and times the square of the ratio of the lower heat capacity volumetrico power (kcal/m) of LPG-by the corresponding "methane", and such pressure must, in mes burners, be less than the 2 psig (usual and the range of 0.5 to 1.5 psig). To see if you review the design of LPG burners or use "propane", to have bigger injectors holes diameter and best aeracao "prima", and must be maintained in the "methane" components such as ethane, propane, tano bu, etc, by eliminating inert gases as OOetc. The "INTER GLP-CHANGER METHANE in F0FN06" consists of devices that if man-has in the region of aspiration/drag the "primary air" close to orifi-cio in gas jetor, and whose walls are of minimum thickness and strict, and material-saving interference in gaseous flow, minima and in a tube "sink" includes usually sympathetic to a "Guide stem" and/or a "structure" tab. When Burns "methane" "sink" tube should touch the bujao or tanpao containing "hole in jetor", so that the fast Jet "methane" is dissipated within the "dis-sipador tube", and it ensures the aid of octn "Guide stem" and/or "s-curve". To burn LPG distances itself at MAX the "pain" of "dispel tube hole injecting" that LPG com help "guide rod", and this can be controlled manually or mechanically (remotely) to fi car both in the position of burning LPG or methane "" and the like. The Yes you can automatically intercanfoiar "gas not inter cambiaveis".

**Classifications:**  
**International (IPC 8-9):** F23C1/00 F24C3/00 (Advanced/Invention);  
F23C1/00 F24C3/00 (Core/Invention)  
**International (IPC 1-7):** F23C1/00 F24C3/00



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| BR8207269 A        | 19840724         | BR19820007269      | 19821210         |

**Priority:**

BR19820007269 19821210

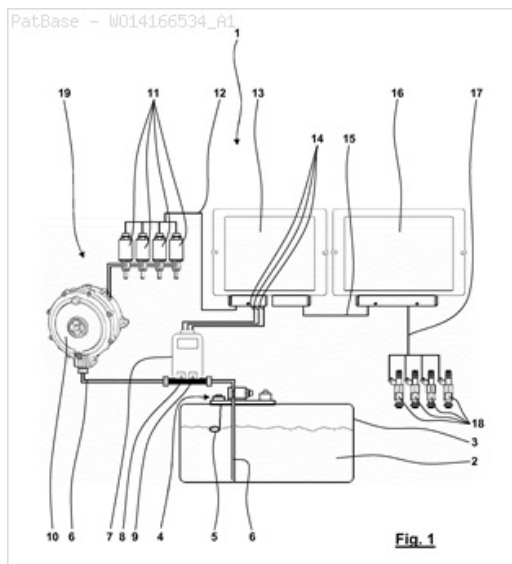
**Probable Assignee:** CELSO SAVELLI GOMES  
**Assignee(s):** (std): CELSO SAVELLI GOMES  
**Inventor(s):** (std): CELSO SAVELLI GOMES ; GOMES CELSO SAVELLI

**7) Family number: 57579416 (WO14166534A1)** © PatBase

**Title:** GAS MIXTURE DETECTION MODULE FOR LIQUEFIED GAS FOR MOTOR VEHICLES

**Abstract:** A device (1) and a method are used to determine the mixing ratio of a liquefied gas mixture (2), in particular autogas (LPG). The gas mixture (2) is intended for combustion in an engine (19) and is fed to the engine from a gas tank (3). A temperature sensor (8) measures the temperature of the liquefied gas mixture (2). A pressure sensor (9) is used to measure the pressure of the gas mixture (2) in the gas tank (3). The measured values of the temperature and of the pressure are fed to a gas mixture detection module (7) connected to the temperature sensor (8) and to the pressure sensor (9). From the measured values of the temperature and of the pressure, the gas mixture detection module (7) determines the current mixing ratio of the gas mixture (2) on the basis of saturation vapour pressure curves (20) for various mixing ratios of the gas mixture (2). The gas control unit (13) is controlled as a function of the current mixing ratio of the gas mixture (2) in order to ensure optimal combustion during the gas combustion operation without the petrol combustion operation being negatively affected.

**Classifications:**  
**International (IPC 8-9):** F02D19/02 F02D19/06 F02D41/00  
F02M21/02 (Advanced/Invention)  
**CPC:** F02D19/026 F02D41/0025 F02D41/0027 F02M21/0215  
F02D19/0626 F02D19/0647 F02D2200/0602 F02D2200/0606  
F02D2200/0612 Y02T10/32 Y02T10/36



#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| EP2984320 A1       | 20160217         | EP20130715685      | 20130410         |
| WO14166534 A1      | 20141016         | WO2013EP57499      | 20130410         |

#### Priority:

WO2013EP57499 20130410

**Probable Assignee:** INTEC AG

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

**Inventor(s):** (std): GIEGER WERNER

**Agent(s):** REHBERG HUEPPE AND PARTNER

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

#### 8) Family number: 54272638 (DE102012100115B4)

© PatBase

**Title:** GASGEMISCHERKENNUNGSMODUL FUER FLUESSIGGAS FUER KRAFTFAHRZEUGE UND ZUGEOERIGES VERFAHREN

**Abstract:** Source: DE102012100115B4 [DE] Eine Vorrichtung (1) und ein Verfahren dienen zur Bestimmung des Mischungsverhaeltnisses eines fluessigen Gasgemisches (2), insbesondere Autogas (LPG). Das Gasgemisch (2) ist fuer die Verbrennung in einem Motor (19) bestimmt und wird diesem aus einem Gastank (3) zugefuehrt wird. Ein Temperatursensor (8) misst die Temperatur des fluessigen Gasgemisches (2). Ein Drucksensor (9) dient zum Messen des Drucks des Gasgemisches (2) in dem Gastank (3). Einem mit dem Temperatursensor (8) und dem Drucksensor (9) verbundenen Gasgemischerkennungsmodul (7) werden die gemessenen Werte der Temperatur und des Drucks zugefuehrt. Das Gasgemischerkennungsmodul (7) bestimmt daraus aufgrund von Saettigungsdampfdruckkurven (20) fuer verschiedene Mischungsverhaeltnisse des Gasgemisches (2) das aktuelle Mischungsverhaeltnis des Gasgemisches (2). In Abhaengigkeit von dem aktuellen Mischungsverhaeltnis des Gasgemisches (2) wird das Gassteuergeraet (13) zur Sicherstellung einer optimalen Verbrennung im Gasverbrennungsbetrieb geregelt, ohne dass der Benzinverbrennungsbetrieb negativ beeinflusst wird.

#### Classifications:

**International (IPC 8-9):** G01N33/22 (Advanced/Invention)

**CPC:** G01N33/225



1323

## GIEGER WERNER

F02D41/0027 F02D2200/0611 Y02T10/36

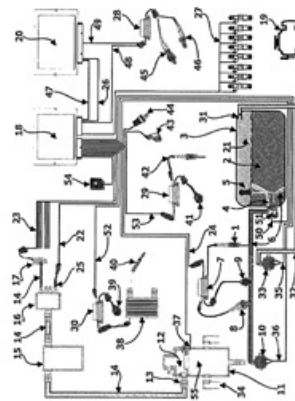


Fig. 1

29/33

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE202016102762 U1  | 20180104         | DE201620102762U    | 20160524         |

**Priority:**

DE201620102762U 20160524

**Probable Assignee:**

LPG SUISSE AG

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

LPG SUISSE AG

**10) Family number: 31950085 (US2005112020A)**

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**Title:** ULTRASONIC AND SONIC ODORIZING SYSTEMS

**Abstract:** A system is shown for injecting a chemical, such as an odorant, from a chemical supply into a fluid containing system such as a natural gas pipeline or an LPG pipeline. A tank of odorant is maintained under a positive pressure which exceeds that of the pipeline. An injection conduit communicates the odorant tank with the pipeline. A precise control flow valve, located within the injection conduit, meters odorant to be injected into the pipeline. An ultrasonic measuring unit allows the odorant to be metered on a drop wise basis with drops of chemical being counted as they pass through the flow valve into the injection conduit and into the natural gas pipeline. The ultrasonic measuring unit also allows steady state flow conditions to be measured accurately. A sonic measuring unit can also be utilized in low flow situations.

**Classifications:**

**International (IPC 8-9):** B01J7/00 G05D11/13 (Advanced/Invention); B01J7/00 G05D11/00 (Core/Invention)

**International (IPC 1-7):** B01J7/00

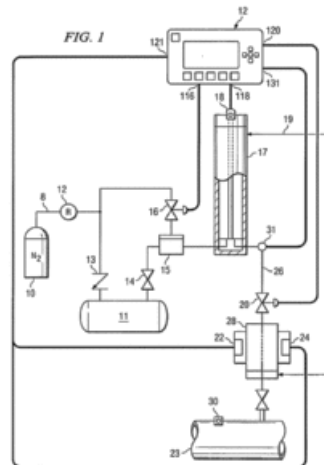
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**European:** G05D11/13B2

**US:** 137/605 137/9 137/98 422/306 422/4 48/195 73/861.28 73/861.41

PatBase - US2005112020\_AA

Patent Application Publication May 26, 2005 Sheet 1 of 2 US 2005/0112020 A1

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2005112020 AA    | 20050526         | US20040990629      | 20041117         |

**Priority:**

US20030524118P 20031121 US20040990629 20041117

**Probable Assignee:** LINC ENERGY SYSTEMS INC

**Assignee(s):** (std): ZECK MARK

**Assignee(s):** ZECK SYSTEMS MANAGEMENT LLC ; LINC ENERGY SYSTEMS INC ; SENTRY EQUIPMENT CORP ; ZECK FAMILY LLC

**Inventor(s):** (std): ZECK MARK

**Agent(s):** CHARLES D GUNTER JR WHITAKER CHALK SWINDLE AND SAWYER LLP; GUNTER JR CHARLES D; CHARLES D

**11) Family number: 34242736** (US2007044774A)

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**Title:** LPI ENGINE SYSTEM

**Abstract:** Disclosed herein is an LPI engine system. The LPI engine system of the present invention directly injects LPG fuel under high pressure into an intake system of an engine through an injector and precisely controls the injection rate of LPG fuel through the control of the injector, thus improving the fuel consumption ratio and power performance of a vehicle, enhancing the startability of the vehicle in the winter, and making maintenance addressing the buildup of tar after combustion unnecessary. Furthermore, in the LPI engine system of the present invention, the injector, which adjusts the injection rate of LPG fuel into the intake system of the engine, includes a path shutoff part which functions to controls an LPG fuel injection path depending on an operational state of the engine, thus preventing LPG fuel from leaking into the intake system of the engine through the injector when the engine is in an ignition OFF state.

**Classifications:**

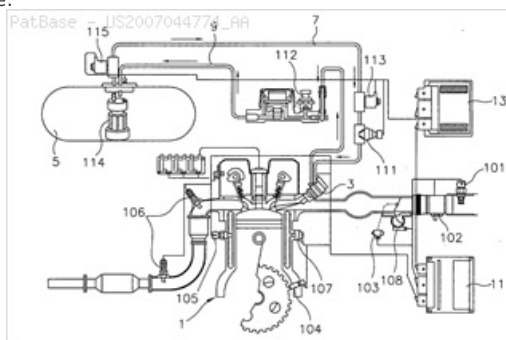
**International (IPC 8-9):** C12Q F02B43/00 F02D19/02 F02D33/00 F02D41/32 F02D41/34 F02D45/00 F02M21/02 F02M51/00 (Advanced/Invention); F02D45/00 F02M21/02 G06F7/00 (Advanced/Non-invention); F02B43/00 F02D19/00 F02D33/00 F02D41/32 F02D41/34 F02D45/00 F02M21/02 F02M51/00 (Core/Invention); G06F7/00 (Core/Non-invention)

**International (IPC 1-7):** C12Q

**CPC:** F02D19/024 F02D19/025 F02D19/027 F02M21/0212 F02M21/0242 F02M21/0245 F02M21/0254 F02M21/026 F02B43/12 F02M51/061 Y02T10/32

**European:** F02B43/12 F02M21/02 F02M21/02S10 R02M51/06B

**US:** 123/478 123/478S 123/527 701/104



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU2006201756 AA    | 20070315         | AU20060201756      | 20060427         |
| AU2006201756 BB    | 20071101         | AU20060201756      | 20060427         |
| CN100570135 C      | 20091216         | CN200610066614     | 20060413         |
| CN1924325 A        | 20070307         | CN200610066614     | 20060413         |
| IN01040DE2006 A    | 20070803         | IN2006DE01040      | 20060424         |
| IN292067 B         | 20180126         | IN2006DE01040      | 20060424         |
| ITMI20060792 A1    | 20070228         | IT2006MI00792      | 20060421         |
| JP2007064201 A2    | 20070315         | JP20060084645      | 20060327         |
| JP4185531 B2       | 20081126         | JP20060084645      | 20060327         |
| KR100747210 B1     | 20070807         | KR20050080177      | 20050830         |
| KR20070028668 A    | 20070313         | KR20050080177      | 20050830         |
| NL1031658 A1       | 20070301         | NL20061031658      | 20060421         |
| NL1031658 C        | 20120612         | NL20061031658      | 20060421         |
| NL1031658 C2       | 20120612         | NL20061031658      | 20060421         |
| US2007044774 AA    | 20070301         | US20050299380      | 20051208         |
| US7182073 BA       | 20070227         | US20050299380      | 20051208         |

**Priority:**

KR20050080177 20050830 US20050299380 20051208

**Probable Assignee:** HYUNDAI MOTOR CO

**Assignee(s):** (std): FRANZOSI ROBERTO ; HYUNDAI MOTOR CO LTD ; KIM DEOK RYOL

**Assignee(s):** HYUNDAI MOTOR COMPANY ; HYUNDAI MOTOR CO

**Inventor(s):** (std): KIM DEOK RYOL ; KIM DEOG YEOR ; RYOL KIM DEOK

**Inventor(s):** DEOK RYOL KIM

**Agent(s):** HODGKINSON MCINNES PATENTS; IP SOLVED ANZ PTY LTD; MORGAN LEWIS AND BOCKIUS LLP (SF)

**12) Family number: 40768485** (JP2007247639A)

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**Title:** LPI GAS INJECTOR SYSTEM, FUEL LEAKAGE PREVENTIVE METHOD USING THE SAME, AND STARTING FAILURE PREVENTIVE METHOD

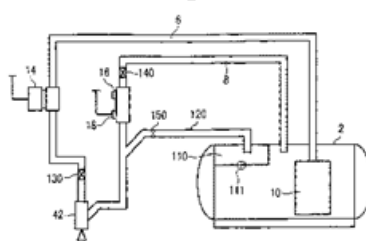
**Abstract:** PROBLEM TO BE SOLVED: To provide an LPI gas injector system capable of improving startability and reducing exhaust gas, and a starting failure preventing method using the system. SOLUTION: The LPI gas injector system for injecting LPG fuel in a fuel cylinder through a gas injector in a high pressure liquid state includes the fuel cylinder, the gas injector, a fuel supply line, a fuel return line, a fuel pump, a multi-valve, a shut-off valve, a fuel pressure regulator, a pressure sensor, a temperature sensor, a cooling water temperature sensor, and an intake air temperature sensor, and is further provided with a bypass line, and an auxiliary fuel cylinder. A fuel supply line valve, a fuel return line valve, and a bypass line valve selectively opening or closing the respective lines are arranged in the fuel supply line, the fuel return line, and the bypass

line.

**Classifications:**

**International (IPC 8-9):** F02D19/02 F02D33/00 F02D41/06  
F02D41/22 F02D41/34 F02D45/00 F02M21/02 F02M21/08 F02M37/00  
F02M37/10 F02N11/08 (Advanced/Invention);  
F02D19/02 F02D41/22 F02M21/02 (Advanced/Non-invention);  
F02D19/00 F02D33/00 F02D41/22 F02D45/00 F02M21/00 F02M21/02  
F02M37/00 F02M37/08 F02N11/08 (Core/Invention)  
**International (IPC 1-7):** C12Q  
**CPC:** Y02T10/34 Y02T10/40 Y02T10/32 Y02T10/123 F02D19/025  
F02D19/022 F02D19/027 F02M21/0242 F02M21/0293

PatBase - JP2007247639\_A2



**Family:**

| Publication number | Publication date | Application number | Application date |
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| AU2006201749 AA    | 20071004         | AU20060201749      | 20060427         |
| AU2006201749 BB    | 20081204         | AU20060201749      | 20060427         |
| CN100472056 C      | 20090325         | CN200610075746     | 20060426         |
| CN101037978 A      | 20070919         | CN200610075746     | 20060426         |
| IN01044DE2006 A    | 20070928         | IN2006DE01044      | 20060424         |
| ITMI20060851 A1    | 20070917         | IT2006MI00851      | 20060428         |
| JP2007247639 A2    | 20070927         | JP20060122084      | 20060426         |
| JP4355713 B2       | 20091104         | JP20060122084      | 20060426         |
| KR100747240 B1     | 20070807         | KR20060024263      | 20060316         |
| NL1031694 A1       | 20070918         | NL20061031694      | 20060426         |
| NL1031694 C        | 20111201         | NL20061031694      | 20060426         |
| NL1031694 C2       | 20111201         | NL20061031694      | 20060426         |

**Priority:**

KR20060024263 20060316

**Probable Assignee:** HYUNDAI MOTOR CO LTD  
**Assignee(s):** (std): FRANZOSI ROBERTO ; HYUNDAI MOTOR CO LTD  
**Assignee(s):** HYUNDAI MOTOR COMPANY ; HYUNDAI MOTOR CO  
**Inventor(s):** (std): JIN CHAE SEUNG ; CHAE SEUNG JIN  
**Inventor(s):** SEUNG JIN CHAE  
**Agent(s):** HODGKINSON MCINNES PATENTS; IP SOLVED ANZ PTY LTD

**13) Family number: 1612792 (DE2641048A1)**

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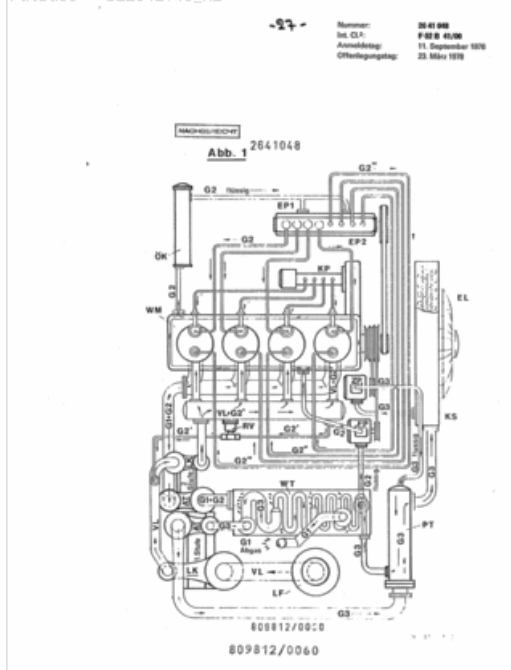
**Title:** MULTI-CYLINDER POLYTROPIC IC ENGINE - HAS VOLATILE LIQ. INJECTED INTO CYLINDER WITH SUBSEQUENT HEAT RECOVERY FROM EXHAUST VIA CONDENSER

**Abstract:** Liquified gas is injected under high pressure into the cylinder during the expansion stage. This recovers some of the heat by flash evaporation and removes the heat from the hot exhaust gas. The gas mixture so obtained is passed through an expansion turbine and finally enters a condenser. The gas is reliquified and recycled by a gear pump and metering pump. The condenser is fed by a compressed gas, which expands during the condensation process. This drives a further turbine. The expanded gas is recycled and some is fed to an air condenser and is returned as liquid. The combined scheme improves the overall thermal efficiency of work obtained per unit of input fuel.

**Classifications:**

**International (IPC 8-9):** F01K27/00 F02B41/00  
F02G5/04 (Advanced/Invention);  
F02B3/06 (Advanced/Non-invention);  
F01K27/00 F02B41/00 F02G5/00 (Core/Invention);  
F02B3/00 (Core/Non-invention)  
**International (IPC 1-7):** F01K27/00 F02B41/00 F02G5/04  
**CPC:** F02G5/04 F01K27/00 F02B3/06 F02B41/00 Y02T10/14  
Y02T10/166  
**European:** F01K27/00 F02B41/00 F02G5/04 R02B3/06

PatBase - DE2641048\_A1



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
|--------------------|------------------|--------------------|------------------|

**Priority:**

DE19762641048 19760911

**Probable Assignee:** HUEBNER HANS JUERGEN ING GRAD

**Assignee(s):** (std): HUEBNER HANS JUERGEN ING GRAD

**Assignee(s):** HUEBNER HANS JUERGEN ING

**Inventor(s):** (std): HUEBNER HANS JUERGEN ING GRAD

**Inventor(s):** HUEBNER HANS JUERGEN ING

**14) Family number: 34324175 (JP2007064206A)**

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**Title:** LEAKAGE SENSING METHOD OF INJECTOR FOR LPI VEHICLE

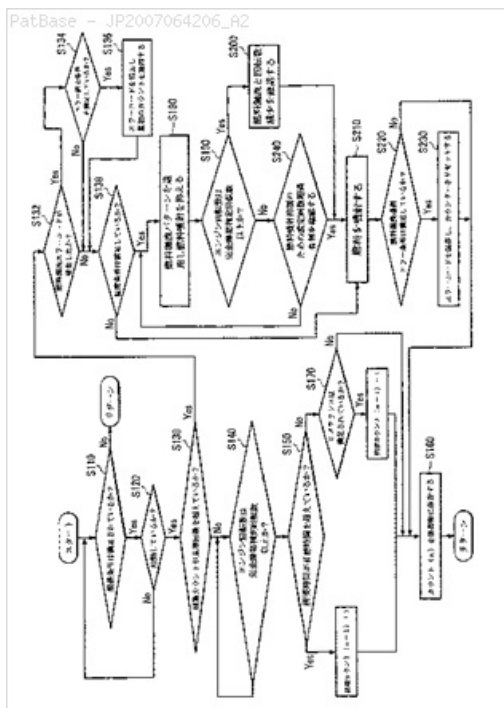
**Abstract:** PROBLEM TO BE SOLVED: To provide a leakage sensing method of an injector for an LPI (liquefied petroleum gas injection) vehicle capable of accurately determining the failure cause of starting by satisfying exhaust regulation by restraining an increase in a hydrocarbon discharge quantity. SOLUTION: This leakage sensing method of the injector for the LPI vehicle finally restrains injection with an integral frequency as a reference by integrating a counter one by one every time when starting required time exceeds target time in a starting delay by fuel leakage of an LPI engine and a reducing pattern of unburnt hydrocarbon HC.

**Classifications:**

**International (IPC 8-9):** F02D19/02 F02D33/00 F02D41/00 F02D41/06 F02D41/22 F02D41/34 F02D45/00 F02M21/02 F02M65/00 F02N11/08 (Advanced/Invention); F02D45/00 (Advanced/Non-invention); F02D19/00 F02D33/00 F02D41/06 F02D41/22 F02D41/34 F02D45/00 F02M21/02 F02N11/08 (Core/Invention)

**International (IPC 1-7):** C12Q

**CPC:** Y02T10/40 Y02T10/32 F02D41/222 F02D19/025 F02D2041/225



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU2006201754 AA    | 20070315         | AU20060201754      | 20060427         |
| AU2006201754 BB    | 20080214         | AU20060201754      | 20060427         |
| CN100441845 C      | 20081210         | CN200610075747     | 20060426         |
| CN1924326 A        | 20070307         | CN200610075747     | 20060426         |
| IN01043DE2006 A    | 20070803         | IN2006DE01043      | 20060424         |
| ITMI20060838 A1    | 20070228         | IT2006MI00838      | 20060427         |
| JP2007064206 A2    | 20070315         | JP20060122710      | 20060426         |
| KR100716361 B1     | 20070511         | KR20050080136      | 20050830         |
| KR20070028639 A    | 20070313         | KR20050080136      | 20050830         |
| NL1031701 A1       | 20070301         | NL20061031701      | 20060426         |
| NL1031701 C        | 20110719         | NL20061031701      | 20060426         |
| NL1031701 C2       | 20110719         | NL20061031701      | 20060426         |

**Priority:**

KR20050080136 20050830

**Probable Assignee:** HYUNDAI MOTOR CO LTD

**Assignee(s):** (std): FRANZOSI ROBERTO ; HYUNDAI MOTOR CO LTD

**Assignee(s):** HYUNDAI MOTOR COMPANY ; HYUNDAI MOTOR CO

**Inventor(s):** (std): JIK LEE WOO ; LEE WOO JIK

**Inventor(s):** WOO JIK LEE

**Agent(s):** HODGKINSON MCINNES PATENTS; IP SOLVED ANZ PTY LTD

**15) Family number: 55126873 (US2014060496A)**

© PatBase

**Title:** SYSTEM AND METHOD FOR CONTROLLING LPG PUMP AND FUEL SUPPLYING SYSTEM OF LPI ENGINE USING THEREOF

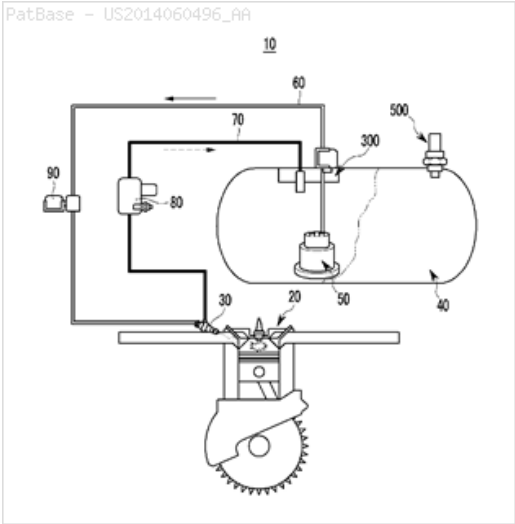
**Abstract:** A method of controlling a liquefied petroleum gas (LPG) fuel pump may include driving a motor of the LPG fuel pump with a voltage of a predetermined duty, measuring a driving speed of the motor, changing the predetermined duty of the motor so that the measured driving speed of the motor reaches a target speed when the measured driving speed of the motor may be not equal to the target speed, measuring pressure of an LPG bombe and pressure of an injector, and changing the target speed when a first difference between the measured pressure of the LPG bombe and the measured pressure of the injector may be not maintained as a first predetermined value.

**Classifications:**

**International (IPC 8-9):** F02B43/00 F02D1/06 F02D19/02 F02D41/38 F02M21/02 F02M37/00 F02M37/08 F02M51/04 (Advanced/Invention)

**CPC:** F02D41/3082 F02M21/0212 F02D41/0027 F02D2041/2027 F02D2200/0602 F02D2250/31 Y02T10/32 F02M51/04

**US:** 123/497



**Family:**

| Publication number  | Publication date | Application number | Application date |
|---------------------|------------------|--------------------|------------------|
| ■ CN103670735 A     | 20140326         | CN201210576476     | 20121226         |
| ■ DE102012113084 A1 | 20140306         | DE201210113084     | 20121224         |
| ■ JP2014051965 A2   | 20140320         | JP20120260028      | 20121128         |
| ■ KR101326851 B1    | 20131111         | KR20120098870      | 20120906         |
| ■ US2014060496 AA   | 20140306         | US20120708817      | 20121207         |

**Priority:**

KR20120098870 20120906

**Probable Assignee:** HYUNDAI MOTOR CO

**Assignee(s):** (std): HYUNDAI MOTOR CO CO LTD ; HYUNDAI MOTOR CO LTD

**Assignee(s):** HYUNDAI MOTOR COMPANY ; HYUNDAI MOTOR COMPANY CO LTD ; HYUNDAI MOTOR CO

**Inventor(s):** (std): HAM CHANG HO ; CHOI PIL SEON ; CHANG HO HAM ; PIL SEON CHOI