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(54) **Fuel injector fixing structure of a fuel injection valve of a common rail of a vehicle**

Befestigungsstruktur einer Kraftstoffeinspritzdüse einer Fahrzeugkraftstoffleiste

Structure de fixation d'injecteur de carburant sur la rampe de carburant d'un véhicule

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Description

TECHNICAL FIELD

[0001] The present invention relates to a fuel rail of a vehicle, and more particularly, to a fuel injector fixing structure of a fuel rail of a vehicle, capable of fixing fuel injectors for injecting fuel into cylinders onto a main pipe of the fuel rail at predetermined intervals by using additional fixing members, so as to sufficiently absorbing a high pressure applied to the fuel injectors when the fuel injectors inject fuel and to appropriately replace the fuel injectors.

BACKGROUND ART

[0002] In general, gasoline engines mainly include indirect multi point injection (MPI) engines and port fuel injection (PFI) engines.

[0003] However, exhaust gas regulations currently tightened to prevent global warming and air pollution may not be satisfied by using only indirect MPI engines.

[0004] In order to satisfy such exhaust gas regulations, gasoline direct injection (GDI) engines capable of directly injecting fuel into engine cylinders as in diesel engines have been developed.

[0005] Although a gasoline indirect MPI engine has a fuel injection pressure of only 4 to 5bar, a GDI engine requires a fuel injection pressure of about 120 to 200bar.

[0006] A GDI engine includes a fuel rail including a plurality of fuel injectors for receiving fuel supplied from a fuel tank and for injecting the fuel.

[0007] Meanwhile, in a GDI engine, since a high fuel pressure and a combustion pressure in combustion chambers of cylinders are directly applied to fuel injectors of a fuel rail when the fuel injectors directly injects fuel into the combustion chambers, the pressures should be absorbed to prevent impacts applied to the fuel injectors toward the fuel rails.

[0008] A conventional fuel rail 10 having the above-described structure is illustrated in FIG. 1.

[0009] As illustrated in FIG. 1, in the conventional fuel rail 10, a plurality of mounting lugs 30 and injector holders 40 are fixed onto a main pipe 20 at predetermined intervals, and fuel injectors 50 are detachably fixed into the injector holders 40, and the pressure applied to fuel injectors 50 is absorbed by damping members 60.

[0010] The mounting lugs 30 and the injector holders 40 are welded and fixed onto an outer surface of the main pipe 20, correspond to the number of cylinders included in an engine, and fix the fuel injectors 50 for injecting fuel into the cylinders.

[0011] The fuel injectors 50 are inserted and fixed into lower portions of the injector holders 40, and each includes an insertion part formed at an upper portion of the fuel injector 50 and inserted into the injector holder 40, and an injection part formed at a lower portion of the fuel injector 50 and for injecting fuel. A connection unit con-

nected to a power source is formed at a side of the fuel injector 50.

[0012] Each of the damping members 60 mainly includes a fixing part surrounding and fixing the fuel injector 50, and damping parts integrally formed at a side of the fixing part, having elasticity, and absorbing the pressures transferred from the fuel injector 50.

[0013] That is, a high pressure generated when the fuel injector 50 injects fuel is absorbed by the damping member 60 such that an impact applied to the fuel injector 50 toward the fuel rail 10 is prevented.

[0014] In the above-described conventional fuel rail 10, the damping member 60 for fixing the fuel injector 50 is fixed onto a body part of the fuel injector 50 before being elastically supported under the injector holder 40, and absorbs a high pressure applied to the fuel injector 50 when the fuel injectors 50 injects fuel.

[0015] However, in order to maintain the form and function of the damping member 60 for preventing an impact caused by a fuel injection pressure and a combustion pressure, a space for fixing the fuel injector 50 onto the main pipe 20 of the fuel rail 10 may be insufficient. As such, when a product is transferred, assembled, removed, or replaced, the fuel injector 50 may be departed from the injector holder 40.

[0016] EP-A-1 892 408 discloses a holder for fixing an injector to a fuel cup. The holder comprises a bottom portion, a notch of the holder, an injector recess, and at least one elastic element. The notch of the holder is arranged for engaging the notch of the holder to a notch of the fuel cup. The injector recess in the bottom portion of the holder is formed in the bottom portion of the holder for taking in the injector. The injector recess of the holder is formed and arranged in such a way that the holder may be fixed to the injector at the injector recess of the holder by a positive connection. The elastic element is arranged at the bottom portion of the holder for forcing the injector away from the fuel cup.

DETAILED DESCRIPTION OF THE INVENTION

TECHNICAL PROBLEM

[0017] The present invention provides a fuel injector fixing structure of a fuel rail of a vehicle, in which an additional fixing member for fixing a fuel injector is added so as to prevent departure of the fuel injector when the fuel rail is transferred, assembled, removed, and replaced, while the role and function of a damping member for absorbing a high pressure applied to the fuel injector when the fuel injector injects fuel is maintained, thereby easily replacing the fuel injector.

[0018] The present invention also provides a fuel injector fixing structure of a fuel rail of a vehicle, in which a fuel injector is elastically supported by a damping member and then a fixing member is fixed onto the fuel injector through a via hole formed in the damping member, thereby fixing the fuel injector.

[0019] The present invention also provides a fuel injector fixing structure of a fuel rail of a vehicle, in which, when a mounting lug and an injector holder fixed onto a main pipe are connected by a connection unit, a fixing member for fixing a fuel injector is variously modifiable by fixing a portion of the fixing member onto the fuel injector and fixing another portion of the fixing member onto the connection unit.

TECHNICAL SOLUTION

[0020] According to an aspect of the present invention, there is provided a fuel injector fixing structure of a fuel rail of a vehicle, including a main pipe having two ends connected to a plug and an end cap; a plurality of injector holders fixed onto an outer surface of the main pipe at predetermined intervals; a mounting lug disposed adjacent to the injector holder; a fuel injector detachably fixed into the injector holder; a damping member detachably attached to the fuel injector and elastically supporting the fuel injector with respect to the injector holder; and a fixing member for detachably fixing the fuel injector fixing member.

[0021] The fixing member includes a holding part surrounding and attached to an outer surface of the fuel injector; and a fixing part extending upwardly from the holding part and detachably fixed onto the injector holder.

[0022] A fixing groove for fixing the holding part is formed on the outer surface of the fuel injector.

[0023] The holding part may include a departure prevention part engaged with the outer surface of the fuel injector and for preventing departure of the fixing member from the fuel injector.

[0024] The departure prevention part may be formed as an engaging bump protruding toward a center of the holding part at an end portion of the holding part.

[0025] A step portion may be formed on the injector holder, a fixing hole may be formed in the fixing part, and the fixing hole of the fixing part may be engaged with the step portion.

[0026] The damping member includes a fixing ring engaged with an outer surface of the fuel injector; and a supporting part extending from the fixing ring and having an end portion, which is bent and elastically contacted to the injector holder.

[0027] A via hole corresponding to the fixing groove is formed in the fixing ring.

[0028] The fixing member includes a holding part surrounding and attached to an outer surface of the fuel injector; and a fixing part extending upwardly from the holding part and detachably fixed onto a connection unit formed between the injector holder and the mounting lug.

[0029] A protrusion may be formed on the connection unit, and a fixing bump engaged with the protrusions may be formed on the fixing part.

[0030] The holding part may include upper and lower members having elasticity and vertically spaced apart from each other by a predetermined distance, a bent part

may be formed in at least one of the upper and lower members, and, the holding part is inserted into the fixing groove of the fuel injector as the bent part is deformed.

ADVANTAGEOUS EFFECTS

[0031] According to the present invention, since a fuel injector is elastically supported by a damping member and is fixed by an additional fixing member, a high pressure applied to the fuel injector when the fuel injector injects fuel may be absorbed and departure of the fuel injector when a fuel rail is transferred, assembled, removed, or replaced may be prevented while the role and function of the damping member is maintained.

[0032] Also, since engaging bumps are formed on a holding part of a fixing member for surrounding and fixing a fuel injector, departure of the fixing member from the fuel injector may be prevented.

[0033] Furthermore, when a mounting lug and an injector holder are connected by a connection unit and are integrally fixed onto a main pipe, a fixing member for fixing a fuel injector may be variously modified by fixing a portion of the fixing member onto the fuel injector and fixing another portion of the fixing member onto the connection unit.

DESCRIPTION OF THE DRAWINGS

[0034]

FIG. 1 is a perspective view of a conventional fuel rail. FIG. 2 is a perspective view showing a fuel injector fixing structure of a fuel rail of a vehicle, according to an embodiment of the present invention.

FIG. 3 is an exploded perspective view of a main portion of FIG. 2.

FIG. 4 is a perspective view of a fixing member in the fuel injector fixing structure illustrated in FIG. 2. FIG. 5 is a perspective view of another fixing member in the fuel injector fixing structure illustrated in FIG. 2. FIG. 6 is a side cross-sectional view showing a fixed state of the fixing member in the fuel injector fixing structure illustrated in FIG. 5.

FIG. 7 is a perspective view of the fixing member in the fuel injector fixing structure illustrated in FIG. 5. FIG. 8 is a perspective view of another fixing member in the fuel injector fixing structure illustrated in FIG. 5.

MODE OF THE INVENTION

[0035] Hereinafter, the present invention will be described in detail by explaining embodiments of the invention with reference to the attached drawings. In the drawings, the thicknesses of lines or the sizes of elements may be exaggerated for clarity and convenience of explanation. Also, the terms used in the specification are defined in consideration of functions used in the present invention, and can be changed according to the intent or

conventionally used methods of operators and users. Accordingly, definitions of the terms should be understood on the basis of the entire description of the present specification.

[0036] FIG. 2 is a perspective view showing a fuel injector fixing structure of a fuel rail 100 of a vehicle, according to an embodiment of the present invention. FIG. 3 is an exploded perspective view of a main portion of FIG. 2. FIG. 4 is a perspective view of a fixing member 700 in the fuel injector fixing structure illustrated in FIG. 2.

[0037] As illustrated in FIGS. 2, 3, and 4, the fuel rail 100 includes a main pipe 200, injector holders 300, mounting lugs 400, fuel injectors 500, damping members 600, and fixing members 700.

[0038] The main pipe 200 has a through hole (not shown) formed along a length direction of the main pipe 200, and includes one end fixed to a plug 210 to be connected to a fuel supply pipe and another end fixed to an end cap 220 for blocking one end of the through hole.

[0039] A plurality of injector holders 300 for detachably fixing the fuel injectors 500 to be described below are formed on an outer surface of the main pipe 200 at predetermined intervals so as to be connected to the through hole.

[0040] That is, connection holes connected to the through hole are formed in the outer surface of the main pipe 200, the injector holder 300 is fixed around the connection hole, and thus fuel in the main pipe 200 is supplied to the fuel injector 500 through the injector holder 300.

[0041] Also, the mounting lug 400 for fixing the fuel rail 100 to an engine or a component around the engine is fixed adjacent to the injector holder 300.

[0042] Here, the injector holder 300 and the mounting lug 400 are fixed on the outer surface of the main pipe 200 by using a laser welding or arc welding method. The laser welding or arc welding method for fixing the injector holder 300 and the mounting lug 400 is well known, and thus will not be described in detail here.

[0043] The injector holder 300 includes an open lower part into which the fuel injector 500 is detachably inserted and fixed, and has a side via hole connected to the connection hole of the main pipe 200 so as to allow fuel in the main pipe 200 to be supplied to the fuel injector 500 through the injector holder 300.

[0044] The fuel injector 500 internally includes various components such as a valve and a valve operating means in order to receive fuel supplied from the main pipe 200 and to inject the fuel into a cylinder. The internal structure of the fuel injector 500 is well known, and thus will not be described in detail here.

[0045] The fuel injector 500 mainly includes an insertion part 510 inserted and fixed into the lower part of the injector holder 300, a body part 520 integrally formed with the insertion part 510 and including various components for injecting fuel, and an injection part 530 formed under the body part 520 and exposed toward a combustion chamber of the cylinder in order to inject fuel.

[0046] The fuel injector 500 is supported under the in-

jector holder 300 by the damping member 600 that holds the body part 520 and absorbs a high pressure generated when the fuel injector 500 injects fuel, and is completely fixed by the fixing member 700 that surrounds and fixes an outer circumference of the body part 520 and is engaged and fixed onto the injector holder 300.

[0047] That is, the fuel injector 500 is formed in such a way that a high pressure generated when the fuel injector 500 injects fuel is absorbed by the damping member 600 and that departure of the fuel injector 500 from the injector holder 300 is prevented by the fixing member 700.

[0048] Here, the damping member 600 includes a fixing ring 610 engaged with an outer surface of the fuel injector 500, and a supporting part 620 extending upwardly from the fixing ring 610 and including upper portions bent and elastically contacted to the injector holder 300.

[0049] The damping member 600 may be formed of an elastic material capable of absorbing an impact caused by a high pressure generated when the fuel injector 500 injects fuel, while the supporting parts 620 elastically contacted to the injector holder 300 and supported under the injector holder 300 are bent due to the impact and then are restored to their original state.

[0050] Also, the fixing member 700 includes a holding part 710 surrounding and attached to the outer surface of the fuel injector 500, and a fixing part 720 extending upwardly from the holding part 710 and detachably fixed onto the injector holder 300.

[0051] The holding part 710 is formed in a "C" shape having a side opening, is engaged around an outer surface of the body part 520 of the fuel injector 500, and includes a departure prevention part 730 engaged with the outer surface of the fuel injector 500, i.e., the body part 520, so as to prevent departure of the holding part 710, at end portions of the holding part 710.

[0052] Here, the departure prevention part 730 is formed as an engaging bump at the end portion of the holding part 710, and the engaging bumps are formed by partially cutting the end portion of the holding part 710 so as to protrude toward the center of the holding part 710.

[0053] Also, the holding part 710 is formed in a ring shape having an opening, and includes cuts 711 formed at the end portions of the holding part 710, and the engaging bumps formed at end portions of the cuts 711 and protruding toward the center of the holding part 710.

[0054] Furthermore, the fixing part 720 extends upwardly from the holding part 710, has an almost "□"-shaped fixing hole, and is engaged with a step portion 310 formed on the injector holder 300.

[0055] The step portion 310 of the injector holder 300 may be formed between a flat part 311 formed by vertically cutting a portion of the injector holder 300, and a curved part 312 remaining at a lower portion of the injector holder 300 to a certain height.

[0056] Also, the holding part 710 of the fixing member

700 is inserted and fixed into a fixing groove 540 formed on the body part 520 of the fuel injector 500. The fixing groove 540 is connected to a via hole 611 formed in the fixing ring 610 of the damping member 600, when the fixing member 700 is fixed onto the body part 520.

[0057] Meanwhile, the via hole 611 is formed in the fixing ring 610 of the damping member 600 such that the holding part 710 of the fixing member 700 is fixed onto the body part 520 by the fixing ring 610 while the fixing ring 610 of the damping member 600 is fixed onto the body part 520 of the fuel injector 500.

[0058] That is, the fuel injector 500 is formed in such a way that the holding part 710 of the fixing member 700 is passed through the via hole 611 of the damping member 600 and is inserted and fixed into the fixing groove 540 of the body part 520 while the damping member 600 is fixed onto the body part 520 and supports the fuel injector 500 with respect to the injector holder 300.

[0059] As described above, since the holding part 710 of the fixing member 700 is fixed into the fixing groove 540 of the fuel injector 500 through the via hole 611 formed in the fixing ring 610 of the damping member 600 fixed onto the body part 520, departure of the damping member 600 from the fuel injector 500 is prevented.

[0060] Alternatively, the fixing ring 610 of the damping member 600 may be formed to surround and fix a lower portion of the fixing groove 540 of the fuel injector 500.

[0061] Meanwhile, FIG. 5 shows a fuel injector fixing structure of the fuel rail 100 when the injector holder 300 and the mounting lug 400 are connected to each other by a connection unit 350, according to another embodiment of the present invention.

[0062] As illustrated in FIG. 5, the injector holder 300 and the mounting lug 400 are connected by the connection unit 350, and protrusions 351 are formed at two sides of the connection unit 350.

[0063] If the connection unit 350 is formed between the injector holder 300 and the mounting lug 400, as illustrated in FIG. 6, another fixing member 700' is used to fix the fuel injector 500 to the connection unit 350.

[0064] As illustrated in FIG. 7, the fixing member 700' includes a holding part 710' surrounding and attached to the fuel injector 500, and a fixing part 720' extending upwardly from the holding part 710' and fixed to the connection unit 350 formed between the injector holder 300 and the mounting lug 400.

[0065] Here, the holding part 710' of the fixing member 700' is the same as the holding part 710 of the fixing member 700 illustrated in FIG. 4, and thus will not be described in detail here.

[0066] The fixing part 720' is formed in a "U" shape having a top opening, and includes fixing bumps 721' formed at an upper portion of the fixing part 720' so as to be engaged and fixed onto the protrusions 351 formed at a lower portion of the connection unit 350.

[0067] That is, the fuel injector 500 may be completely fixed by engaging the fixing bumps 721' of the fixing part 720' of the fixing member 700' onto the protrusions 351

while the holding part 710' of the fixing member 700' is engaged onto the body part 520.

[0068] Also, as illustrated in FIG. 8, a holding part 710" of a fixing member 700" includes upper and lower members 711" and 712" having elasticity, facing each other, and vertically spaced apart from each other by a predetermined distance. A bent part 713" is formed in one of the upper and lower members 711" and 712", and the holding part 710" is inserted into the fixing groove 540 of the fuel injector 500 as the bent part 713" is deformed. Here, as a fixing part 720", the fixing part 720' of the fixing member 700 or the fixing part 720' of the fixing member 700' may be selected and used.

[0069] Operation of the above-described fuel rail 100 will now be described in brief.

[0070] Initially, the end cap 220 and the plug 210 are individually fixed onto two ends of the main pipe 200 of the fuel rail 100 by using a brazing method. Here, the brazing method for fixing the end cap 220 and the plug 210 onto the main pipe 200 will not be described in detail here.

[0071] Then, a plurality of injector holders 300 and a plurality of mounting lugs 400 are welded and fixed onto an outer surface of the main pipe 200.

[0072] After that, the insertion part 510 of the fuel injector 500 is inserted into an open lower portion of the injector holder 300. Then, the fixing ring 610 of the damping member 600 is placed under the injection part 530 of the fuel injector 500 and then is raised to be fixed around the body part 520 of the fuel injector 500 such that the supporting parts 620 of the damping member 600 contact and are supported under the injector holder 300.

[0073] Here, the fuel injector 500 may also be fixed into the injector holder 300 after the damping member 600 is fixed onto the fuel injector 500.

[0074] As described above, since the fuel injector 500 is elastically supported by the damping member 600, an impact applied to the fuel injector 500 toward the main pipe 200 due to a high pressure generated when the fuel injector 500 injects fuel may be efficiently reduced and prevented.

[0075] Then, the fuel injector 500 is fixed by the fixing member 700 and thus is detachably and completely fixed into the injector holder 300.

[0076] That is, the fuel injector 500 is completely fixed by inserting and fixing the holding part 710 of the fixing member 700 into the fixing groove 540 of the fuel injector 500, and then engaging the fixing part 720 of the fixing member 700 with the step portion 310 of the injector holder 300.

[0077] As such, since the fuel injector 500 is completely fixed into the injector holder 300 by the additional fixing member 700, departure of the fuel injector 500 from the injector holder 300 when the fuel rail 100 is used, transferred, assembled, or replaced may be prevented.

[0078] While the present invention has been particularly shown and described with reference to exemplary embodiments thereof, it will be understood by one of or-

dinary skill in the art that various changes in form and details may be made therein without departing from the spirit and scope of the present invention as defined by the following claims.

Claims

1. A fuel injector fixing structure of a fuel rail of a vehicle, comprising:

a main pipe (200) having two ends connected to a plug (210) and an end cap (220);
 a plurality of injector holders (300) fixed onto an outer surface of the main pipe (200) at predetermined intervals;
 a mounting lug (400) disposed adjacent to the injector holder (300);
 a fuel injector (500) detachably fixed into the injector holder (300);
 a damping member (600) detachably attached to the fuel injector (500) and elastically supporting the fuel injector (500) with respect to the injector holder (300) and comprising a fixing ring (610) engaged with an outer surface of the fuel injector (500), and a supporting part (620) extending from the fixing ring (610) and having an end portion, which is bent and elastically contacted to the injector holder (300); and
 a fixing member (700, 700', 700'') for detachably fixing the fuel injector (500) onto the injector holder (300) and comprising a holding part (710, 710', 710'') surrounding and attached to an outer surface of the fuel injector (500), and a fixing part (720, 720', 720'') extending upwardly from the holding part (710, 710', 710'') and detachably fixed onto the injector holder (300),
 wherein a fixing groove (540) for fixing the holding part (710, 710', 710'') is formed on the outer surface of the fuel injector (500), and a via hole (611) corresponding to the fixing groove (540) is formed in the fixing ring (610),
 wherein the holding part (710) of the fixing member (700) is fixed into the groove (540) of the fuel injector (500) through the via hole (611).

2. The fuel injector fixing structure of claim 1, wherein the holding part (710) comprises a departure prevention part (730), which is engaged with the outer surface of the fuel injector (500), for preventing departure of the fixing member (700) from the fuel injector (500).
3. The fuel injector fixing structure of claim 2, wherein the departure prevention part (730) is formed as an engaging bump protruding toward a center of the holding part (710) at an end portion of the holding part (710).

4. The fuel injector fixing structure of claim 1, wherein a step portion (310) is formed on the injector holder (300), wherein a fixing hole is formed in the fixing part (720), and wherein the fixing hole of the fixing part (720) is engaged with the step portion (310).

5. The fuel injector fixing structure of claim 1, wherein the fixing member (700', 700'') further comprises a fixing part (720', 720'') extending upwardly from the holding part (710', 710'') and detachably fixed onto a connection unit (350) formed between the injector holder (300) and the mounting lug (400).

6. The fuel injector fixing structure of claim 5, wherein a protrusion (351) is formed on the connection unit (350), and wherein a fixing bump (721') engaged with the protrusions (351) is formed on the fixing part (720').

7. The fuel injector fixing structure of claim 2 or 5, wherein the holding part (710'') comprises upper and lower members (711'', 712'') having elasticity and vertically spaced apart from each other by a predetermined distance, wherein a bent part (713'') is formed in at least one of the upper and lower members (711'', 712''), and wherein the holding part (710'') is inserted into the fixing groove (540) of the fuel injector (500) as the bent part (713'') is deformed.

Patentansprüche

1. Eine Kraftstoffeinspritzvorrichtungsfixierungsstruktur eines Kraftstoffzuteilers eines Fahrzeugs, die folgende Merkmale aufweist:

ein Hauptrohr (200), das zwei Enden aufweist, die mit einem Stopfen (210) und einer Endabdeckung (220) verbunden sind;
 eine Mehrzahl von Einspritzvorrichtungshalterungen (300), die in vorbestimmten Abständen auf einer Außenoberfläche des Hauptrohrs (200) fixiert ist;
 einen neben der Einspritzvorrichtungshalterung (300) angeordneten Anbringansatz (400);
 eine in der Einspritzvorrichtungshalterung (300) abnehmbar fixierte Kraftstoffeinspritzvorrichtung (500);
 ein Dämpfungsbauglied (600), das abnehmbar an der Kraftstoffeinspritzvorrichtung (500) befestigt ist und die Kraftstoffeinspritzvorrichtung (500) bezüglich der Einspritzvorrichtungshalterung (300) auf federnde Weise trägt und einen Fixierungsring (610), der mit einer Außenoberfläche der Kraftstoffeinspritzvorrichtung (500) in Eingriff steht, und ein Trageteil (620) aufweist, das sich von dem Fixierungsring (610) aus erstreckt und einen Endabschnitt aufweist, der ge-

- bogen und mit der Einspritzvorrichtungshalterung (300) federnd in Kontakt steht; und ein Fixierungsbauglied (700, 700', 700'') zum abnehmbaren Fixieren der Kraftstoffeinspritzvorrichtung (500) an der Einspritzvorrichtungshalterung (300), das ein Halteteil (710, 710', 710''), das eine Außenoberfläche der Kraftstoffeinspritzvorrichtung (500) umgibt und an derselben befestigt ist, und ein Fixierungsteil (720, 720', 720'') aufweist, das sich von dem Halteteil (710, 710', 710'') nach oben erstreckt und abnehmbar an der Einspritzvorrichtungshalterung (300) fixiert ist, bei der eine Fixierungsrille (540) zum Fixieren des Halteteils (710, 710', 710'') auf der Außenoberfläche der Kraftstoffeinspritzvorrichtung (500) gebildet ist und ein Durchgangsloch (611), das der Fixierungsrille (540) entspricht, in dem Fixierungsring (610) gebildet ist, bei der das Halteteil (710) des Fixierungsbauglieds (700) durch das Durchgangsloch (611) hindurch in der Rille (540) der Kraftstoffeinspritzvorrichtung (500) fixiert ist.
2. Die Kraftstoffeinspritzvorrichtungsfixierungsstruktur gemäß Anspruch 1, bei der das Halteteil (710) ein Ablösungsverhinderungsteil (730) aufweist, das mit der Außenoberfläche der Kraftstoffeinspritzvorrichtung (500) in Eingriff steht, um eine Ablösung des Fixierungsbauglieds (700) von der Kraftstoffeinspritzvorrichtung (500) zu verhindern.
 3. Die Kraftstoffeinspritzvorrichtungsfixierungsstruktur gemäß Anspruch 2, bei der das Ablösungsverhinderungsteil (730) als in Eingriffnahmehöcker gebildet ist, der an einem Endabschnitt des Halteteils (710) zu einer Mitte des Halteteils (710) hin vorsteht.
 4. Die Kraftstoffeinspritzvorrichtungsfixierungsstruktur gemäß Anspruch 1, bei der an der Einspritzvorrichtungshalterung (300) ein Stufenabschnitt (310) gebildet ist, wobei in dem Fixierungsteil (720) ein Fixierungsloch gebildet ist und wobei das Fixierungsloch des Fixierungsteils (720) mit dem Stufenabschnitt (310) in Eingriff steht.
 5. Die Kraftstoffeinspritzvorrichtungsfixierungsstruktur gemäß Anspruch 1, bei der das Fixierungsbauglied (700', 700'') ferner ein Fixierungsteil (720', 720'') aufweist, das sich von dem Halteteil (710', 710'') aus nach oben erstreckt und abnehmbar an einer Verbindungseinheit (350) fixiert ist, die zwischen der Einspritzvorrichtungshalterung (300) und dem Anbringansatz (400) gebildet ist.
 6. Die Kraftstoffeinspritzvorrichtungsfixierungsstruktur gemäß Anspruch 5, bei der ein Vorsprung (351) an der Verbindungseinheit (350) gebildet ist und bei der an dem Fixierungsteil (720') ein mit den Vorsprüngen (351) in Eingriff stehender Fixierungshöcker (721') gebildet ist.
 7. Die Kraftstoffeinspritzvorrichtungsfixierungsstruktur gemäß Anspruch 2 oder 5, bei der das Halteteil (710'') ein oberes und ein unteres Bauglied (711'', 712'') aufweist, die Elastizität aufweisen und in einem vorbestimmten Abstand vertikal voneinander beabstandet sind, wobei in zumindest entweder dem oberen und/oder dem unteren Bauglied (711'', 712'') ein Biegeteil (713'') gebildet ist und wobei das Halteteil (710'') in die Fixierungsrille (540) der Kraftstoffeinspritzvorrichtung (500) eingefügt wird, während das gebogene Teil (713'') verformt wird.

Revendications

1. Structure de fixation d'injecteur de carburant sur une rampe de carburant d'un véhicule, comprenant:

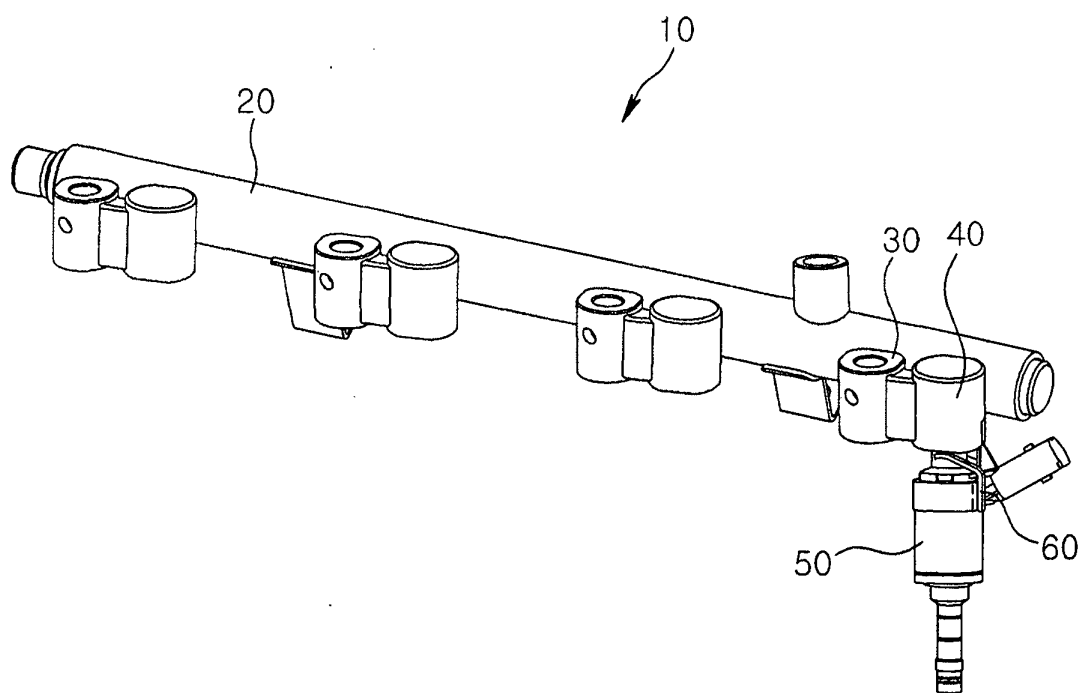
une conduite principale (200) présentant deux extrémités connectées à un bouchon (210) et un capuchon d'extrémité (220);
 une pluralité de porte-injecteur (300) fixés sur une surface extérieure de la conduite principale (200) à des intervalles prédéterminés;
 une patte de montage (400) disposée adjacente au porte-injecteur (300);
 un injecteur de carburant (500) fixé de manière amovible dans le porte-injecteur (300);
 un élément d'amortissement (600) fixé de manière amovible à l'injecteur de carburant (500) et supportant de manière élastique l'injecteur de carburant (500) par rapport au porte-injecteur (300) et comprenant une bague de fixation (610) en prise avec une surface extérieure de l'injecteur de carburant (500), et une partie de support (620) s'étendant à partir de la bague de fixation (610) et présentant une partie d'extrémité qui est recourbée et en contact de manière élastique avec le porte-injecteur (300); et
 un élément de fixation (700, 700', 700'') destiné à fixer de manière amovible l'injecteur de carburant (500) sur le porte-injecteur (300) et comprenant une partie de retenue (710, 710', 710'') entourant et fixée à une surface extérieure de l'injecteur de carburant (500), et une partie de fixation (720, 720', 720'') s'étendant vers le haut depuis la partie de retenue (710, 710', 710'') et fixée de manière amovible sur le porte-injecteur (300),
 dans laquelle une rainure de fixation (540) destinée à fixer la partie de retenue (710, 710', 710'') est formée sur la surface extérieure de l'injecteur de carburant (500), et un trou d'interconnexion (611) correspondant à la rainure de fixation

(540) est formé dans la bague de fixation (610), dans laquelle la partie de retenue (710) de l'élément de fixation (700) est fixée dans la rainure (540) de l'injecteur de carburant (500) à travers le trou d'interconnexion (611).

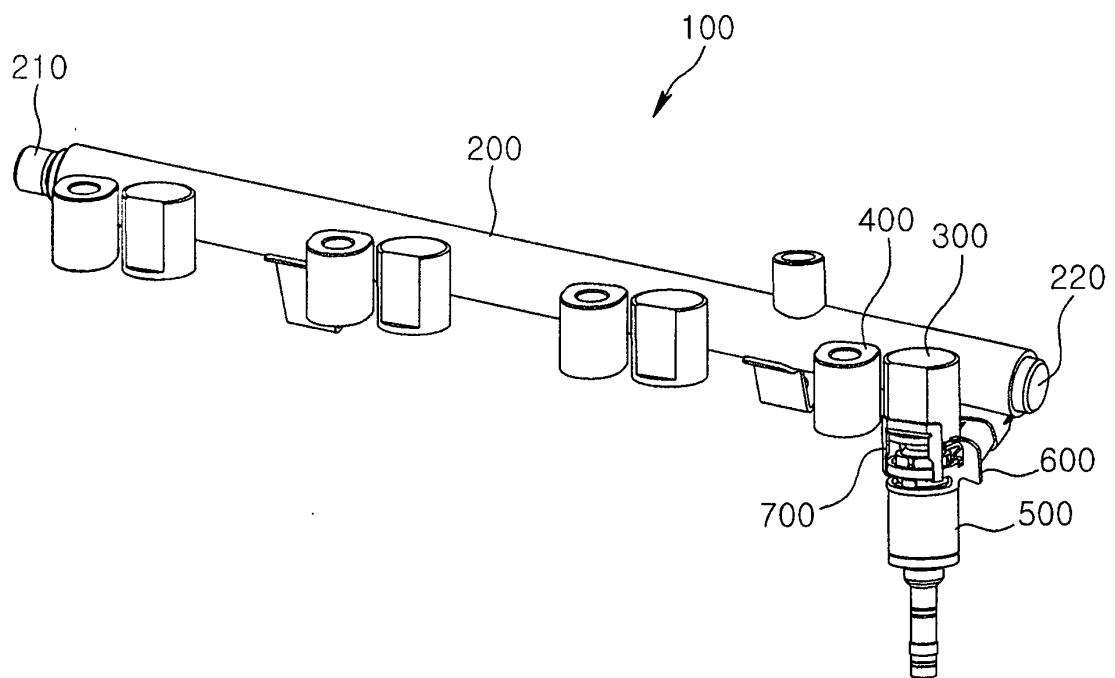
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2. Structure de fixation d'injecteur de carburant selon la revendication 1, dans laquelle la partie de retenue (710) comprend une partie d'empêchement de séparation (730) qui est en prise avec la surface extérieure de l'injecteur de carburant (500), pour empêcher la séparation de l'élément de fixation (700) de l'injecteur de carburant (500). 10
3. Structure de fixation d'injecteur de carburant selon la revendication 2, dans laquelle la partie d'empêchement de séparation (730) se présente sous forme d'une bosse de venue en prise faisant saillie vers un centre de la partie de retenue (710) à une partie d'extrémité de la partie de retenue (710). 15 20
4. Structure de fixation d'injecteur de carburant selon la revendication 1, dans laquelle une partie étagée (310) est formée sur le porte-injecteur (300), dans laquelle un trou de fixation est formé dans la partie de fixation (720), et dans laquelle le trou de fixation de la partie de fixation (720) est en prise avec la partie étagée (310). 25
5. Structure de fixation d'injecteur de carburant selon la revendication 1, dans laquelle l'élément de fixation (700', 700'') comprend par ailleurs une partie de fixation (720', 720'') s'étendant vers le haut depuis la partie de retenue (710', 710'') et fixée de manière amovible sur une unité de connexion (350) formée entre le porte-injecteur (300) et la patte de montage (400). 30 35
6. Structure de fixation d'injecteur de carburant selon la revendication 5, dans laquelle une saillie (351) est formée sur l'unité de connexion (350), et dans laquelle une bosse de fixation (721') en prise avec les saillies (351) est formée sur la partie de fixation (720'). 40 45
7. Structure de fixation d'injecteur de carburant selon la revendication 2 ou 5, dans laquelle la partie de retenue (710'') comprend des éléments supérieur et inférieur (711'', 712'') présentant une élasticité et espacés verticalement l'un de l'autre d'une distance prédéterminée, dans laquelle une partie recourbée (713'') est formée dans au moins l'un des éléments supérieur et inférieur (711'', 712''), et dans laquelle la partie de retenue (710'') est introduite dans la rainure de fixation (540) de l'injecteur de carburant (500) au fur et à mesure que la partie recourbée (713'') est déformée. 50 55

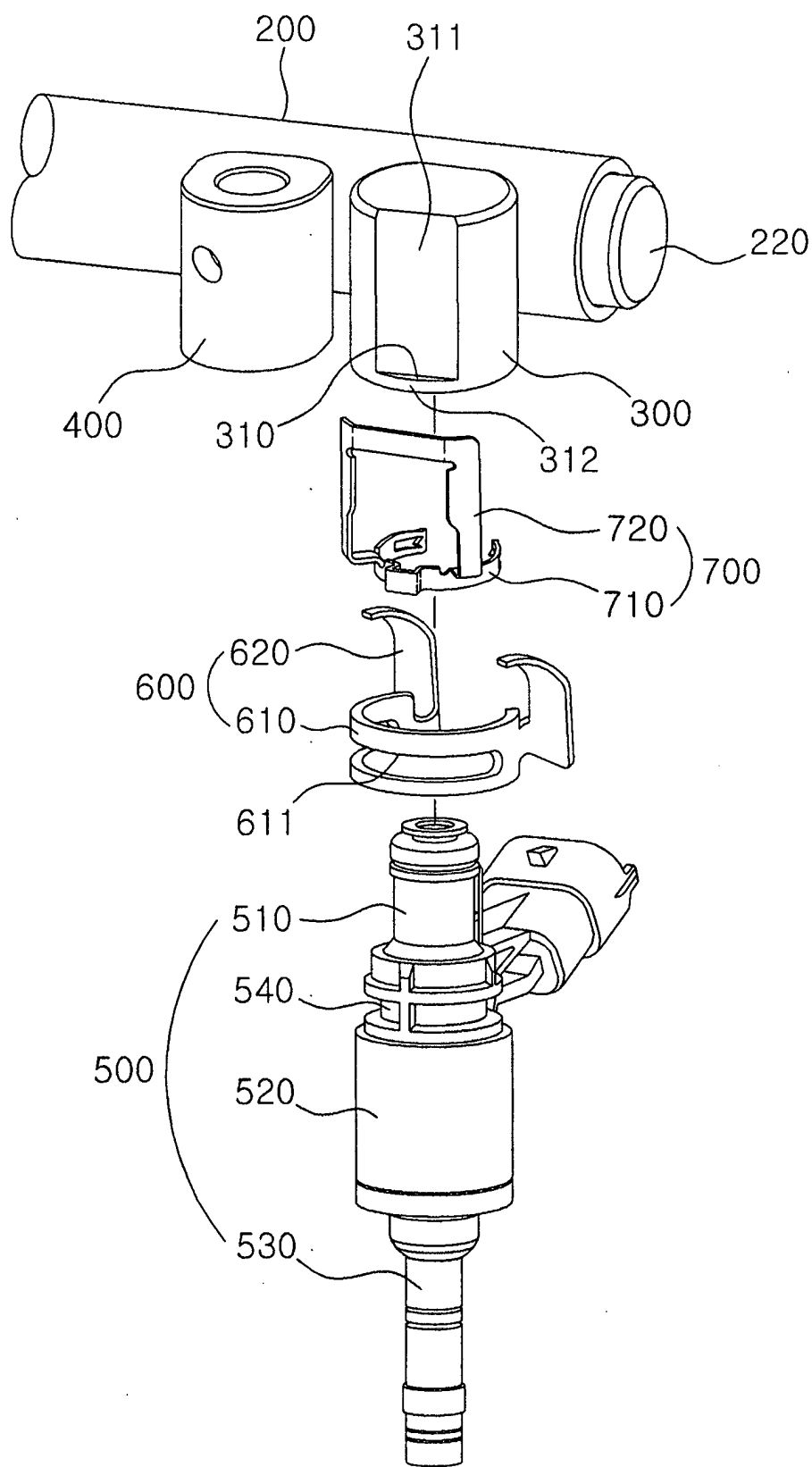
[Fig. 1]



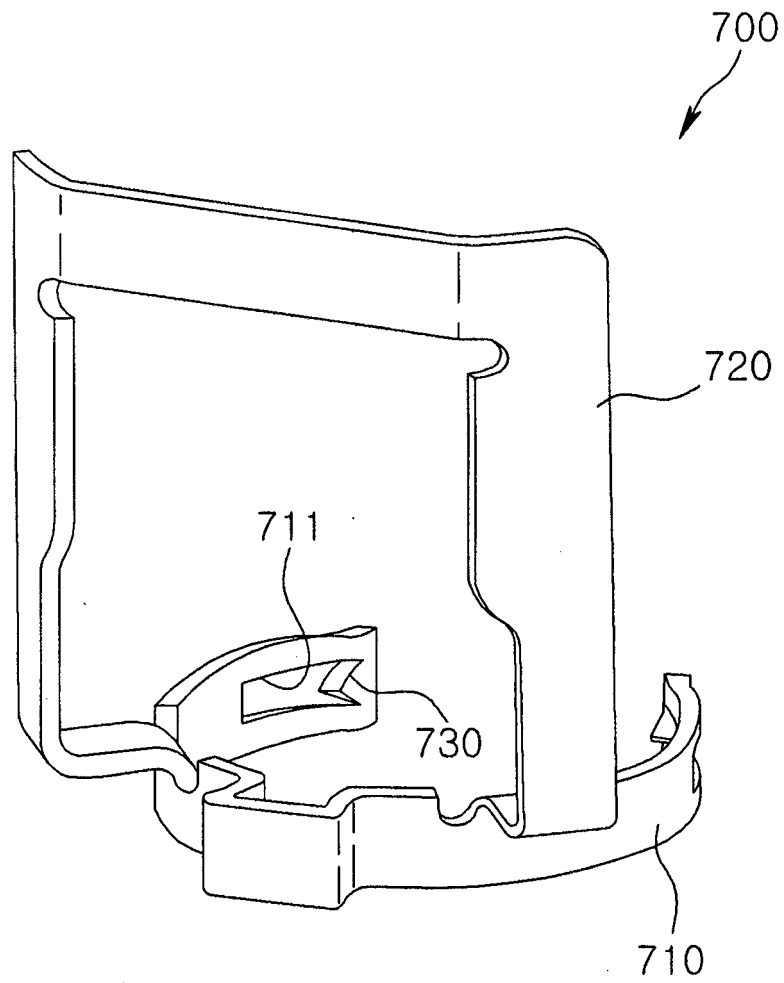
[Fig. 2]



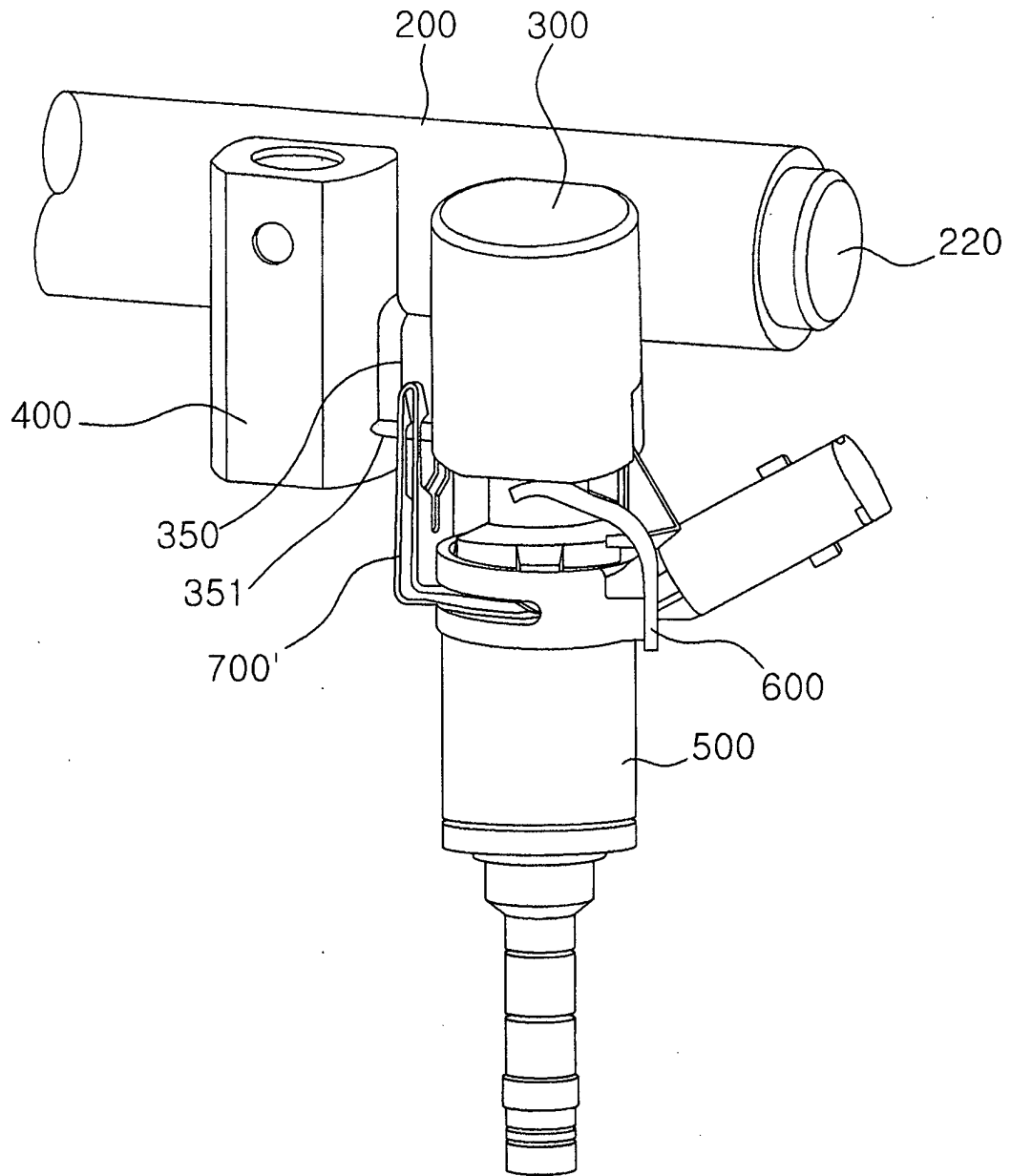
[Fig. 3]



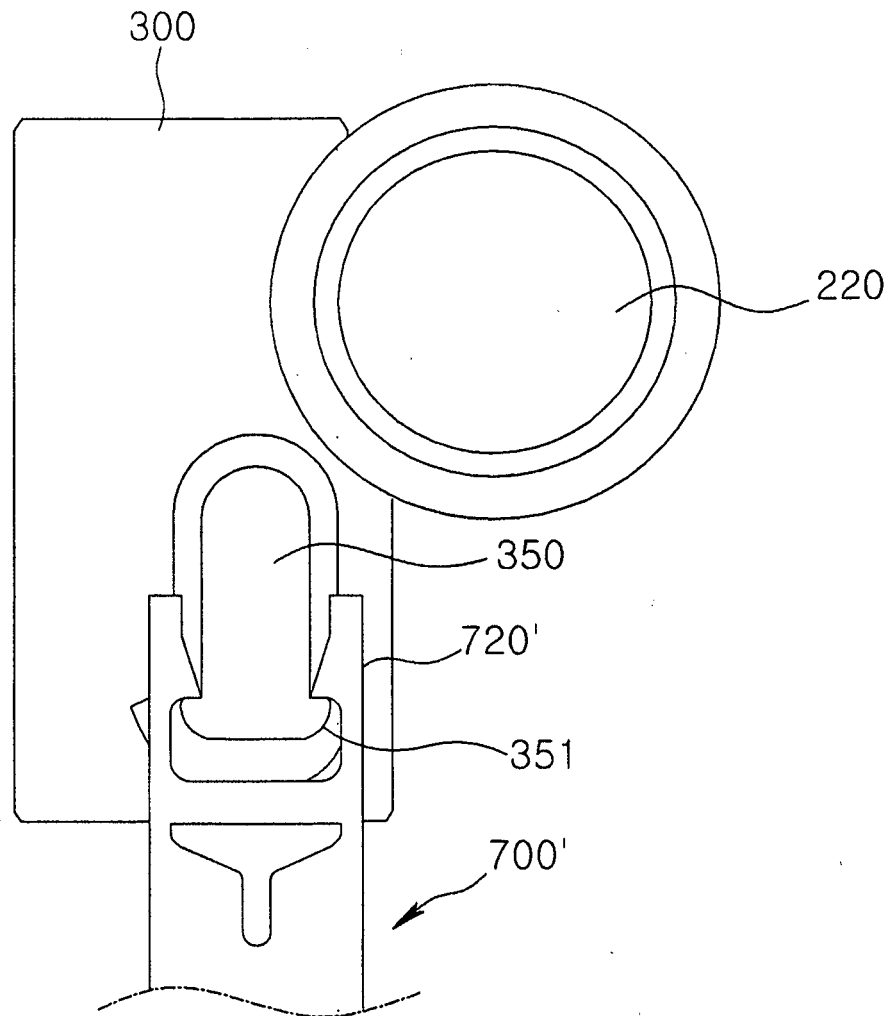
[Fig. 4]



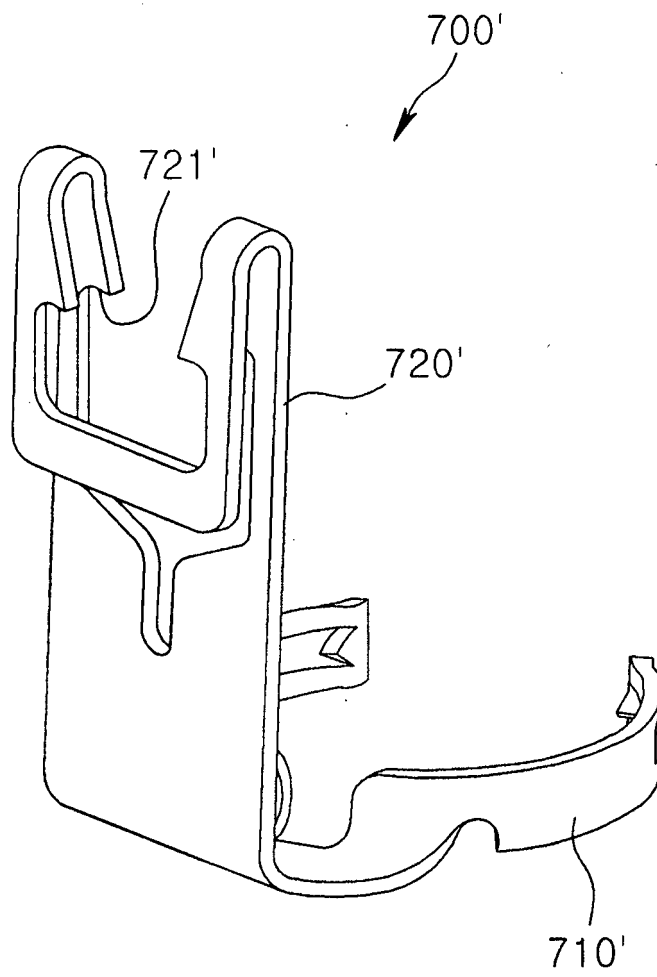
[Fig. 5]



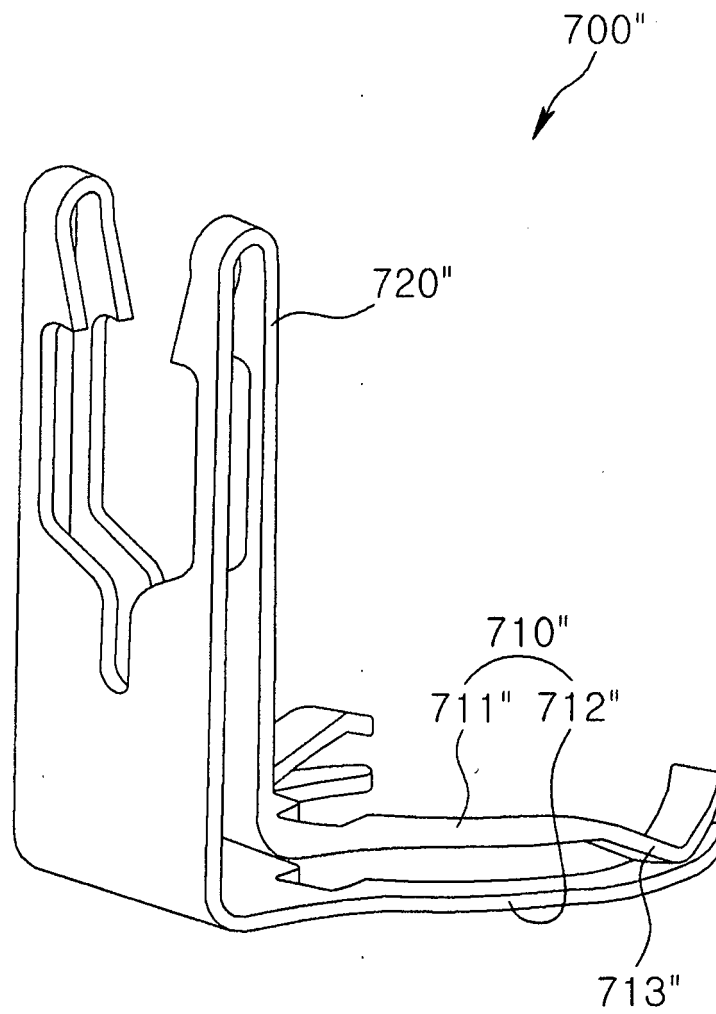
[Fig. 6]



[Fig. 7]



[Fig. 8]



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1892408 A [0016]