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(54) Vehicle control pedals having release mechanism

(57) Control pedals of a vehicle provided with a mechanism of release comprising a pedal 2 for being adjustably pivoted, so that to rotate with respect to a coupling support 3 connected to the front wall of a panel P for the separation of the passenger compartment from the engine compartment. The mechanism of release comprises a coupling bracket 4 which is integrally constrained to a frame cross member B of the vehicle and is constrained to the support 3, so that during a relative movement between the cross member and the panel caused by a substantially frontal impact of the vehicle, a relative movement of a predetermined quantity that determines the release of the pedal 2 from the support 3 can exist between the cross member and the support itself.

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Description

[0001] The present invention relates to a mechanism of safety release of control pedals of a vehicle. In particular, the present invention relates to a mechanism of safety release of the pedals, when the vehicle is subject to a frontal impact.

[0002] In these situations the control pedals can be a danger for the driver, because they can enter the passenger compartment damaging the driver's legs.

[0003] Different solutions have been proposed by means of which the control pedals can be released from the support.

[0004] Generally, motor vehicles are provided with pedals for controlling the acceleration, the braking and the clutch actuation. These pedals are normally composed of an arm that is supported in rotation by a bracket positioned on the floor panel of the vehicle, a means for connecting the accelerator, the brakes or the clutch and the pedal's arm, and a carpet connected to the non-articulated end of the pedal's arm, for allowing the thrust from the driver.

[0005] There are various kinds of devices known to the technique that allow a collapse of the pedals, and in particular of its arm, after a frontal impact of the vehicle. Among these known devices there is, for instance, the one that allows the movement of the articulation point of the arm of a pedal, after a frontal impact, in such a way to avoid damages to the lower limbs of the driver of the vehicle.

[0006] This device is shown in the European patent application n° EPA-1.065.114.

[0007] A feature of the present invention refers to control pedals having the characteristics of the attached claim 1.

[0008] The characteristics and the advantages of the control pedals according to the present invention are highlighted by the following description, exemplificative and non-limiting, made with reference to the attached figures that show respectively:

- Figure 1 shows in a perspective view the control pedals in their entirety according to the present invention constrained to the cross member under the dashboard and to a panel for the separation of the passenger compartment from the engine compartment of the vehicle itself;
- Figure 2 shows a magnified view of the mechanism of release of the control pedals according to the present invention;
- Figure 3 shows another magnified view from a different angle shot of the mechanism of release of figure 2;
- Figure 4 shows an exploded view of the control pedals and of the components of the mechanism of release according to the present invention;
- Figure 5 shows in a perspective view the bracket of release of the mechanism of release according to the present invention;
- Figure 6 shows the releasing phase of the pedal from the coupling support according to the present invention;
- Figure 7 shows another magnified view of the mechanism of release of the control pedals according to the present invention.

[0009] With reference to the abovementioned figures, the control pedals according to the present invention comprise a mechanism of release that allows the collapse or the release of a pedal, when the vehicle is involved in a frontal impact.

[0010] The control pedals typically comprise at least a pedal 2 for being adjustably constrained in such a way to rotate on a coupling support 3 connected to the front wall of a panel P (or to an equivalent element) for the separation of the passenger compartment from the engine compartment.

[0011] The pedal is provided at its upper end with a bushing 21 that is integral with the pedal and a pivot pin 41 that is integral with the support, that is advantageously insertable on an opposed couple of seats 31 obtained on the support 3.

[0012] The pivot pin is maintained in these seats through a couple of opposed stop levers 42 that are constrained to the support 3 through pins 43. The levers 42 can rotate around the axis of these pins 43, but are normally maintained in a closed position so that to maintain constrained the pedal to the support 3, through a fork 44 engaged in suitable notches 45 of the levers themselves. The fork 44 is maintained in a fixed position on the support through a hook 32.

[0013] The mechanism of release allows the release of the pedal from the support when the vehicle is involved in a frontal impact, in such a way to move the panel P and consequently the support 3 toward the inner part of the passenger compartment of the vehicle.

[0014] For this purpose the mechanism comprises a coupling bracket 4 which is integrally constrained to the cross member under the dashboard, It is considered as a substantially "fixed" point of the vehicle, whereas the panel P can move toward the vehicle interior during a frontal impact.

[0015] As a matter of fact, during an impact the cross member B and the panel P are able to relatively move the one with respect to the other substantially with respect to an horizontal plane.

[0016] This coupling bracket is constrained to the support 3 so that during this relative movement between the panel and the bar, between this one and the support itself a relative movement of a predetermined quantity can exist.

[0017] This can be obtained through a couple of slots 46 realized on the bracket provided with seats for housing the head of screws or of pins or equivalent fastening means 47 that fix in turn in the support 3.

[0018] In this way, in case of a frontal impact and of

relative movement between the bar and the panel, screws or pins can move within the slot, whose size determines the abovementioned predetermined quantity.

[0019] The bracket 4 also comprises at least a guide 48 that associates to a corresponding protuberance 33 of the support 3, in such a way to determine, along with the slots 46 and the fastening means 47, a preferential direction for the relative movement between it and the support itself.

[0020] Furthermore, the bracket comprises a wedge-shaped portion 49 for inserting in the support 3 and for inserting under the central portion of the fork 44 that is preferably reversed "U"-shaped for helping the positioning of the wedge.

[0021] The mechanism of release operates as follows.

[0022] Depending on the relative movement between the panel P and the cross member B, also the support 3 and the bracket 4 undergo a relative movement between them approaching the one to the other.

[0023] As an effect of this approach, the wedge-shaped portion 49 of the bracket 4 tends to insert in the support 3 and to insert even more under the fork 44 releasing it from the hook 32 and determining the hoisting.

[0024] This hoisting causes the release of it from the notches 45 of the levers 42 determining the rotation F toward the lower part of them (as shown in particular in figure 6, arrow F). in this position the pivot pin 41 can come out of the seats 31 and release the pedal 2 from the support 3.

Claims

1. Control pedals of a vehicle provided with a mechanism of release comprising
   at least a pedal (2) for being adjustably pivoted, so that to rotate with respect to a coupling support (3) connected to the front wall of a panel (P) for the separation of the passenger compartment from the engine compartment,
   characterized in that said mechanism of release comprises a coupling bracket (4) which is integrally constrained to a frame cross member (B) of the vehicle and is constrained to the support (3), so that during a relative movement between the cross member and the panel caused by a substantially frontal impact of the vehicle, a relative movement of a predetermined quantity that determines the release of the pedal (2) from the support (3) can exist between the cross member and the support itself.

2. Control pedals according to claim 1, wherein the relative movement between the bracket (4) and the support (3) is obtained through a couple of slots (46) realized on the bracket, provided with seats for housing the head of screws or of pins or equivalent fastening means (47) that fix in turn in the support (3).

3. Control pedals according to claim 1, wherein said predetermined quantity is equal to the size of the slots.

4. Control pedals according to claim 1, wherein the pedal at its upper end is provided with a bushing (21) and a pivot pin (41) sliding within it, that is insertable on an opposed couple of seats (31) obtained on the support (3).

5. Control pedals according to claim 4, wherein the pivot pin is maintained in said seats through a couple of opposed stop levers (42) that can rotate around the axis of pins (43), but are normally maintained in a closed position so that to maintain constrained the pedal to the support (3), through a fork (44) engaged in suitable notches (45) of the levers themselves.

6. Control pedals according to claim 5, wherein the bracket (4) comprises a wedge-shaped portion (49) for inserting in the support (3) and for inserting under the central portion of the fork (44) by releasing it from the levers (42) at the moment of a frontal impact.

7. Control pedals according to claim 6, wherein the central portion of the fork is reversed "U"-shaped.

8. Control pedals according to claim 1, wherein the bracket (4) comprises at least a guide (48) that associates to a corresponding protuberance (33) of the support, that determines a preferential direction for the relative movement between it and the support itself.

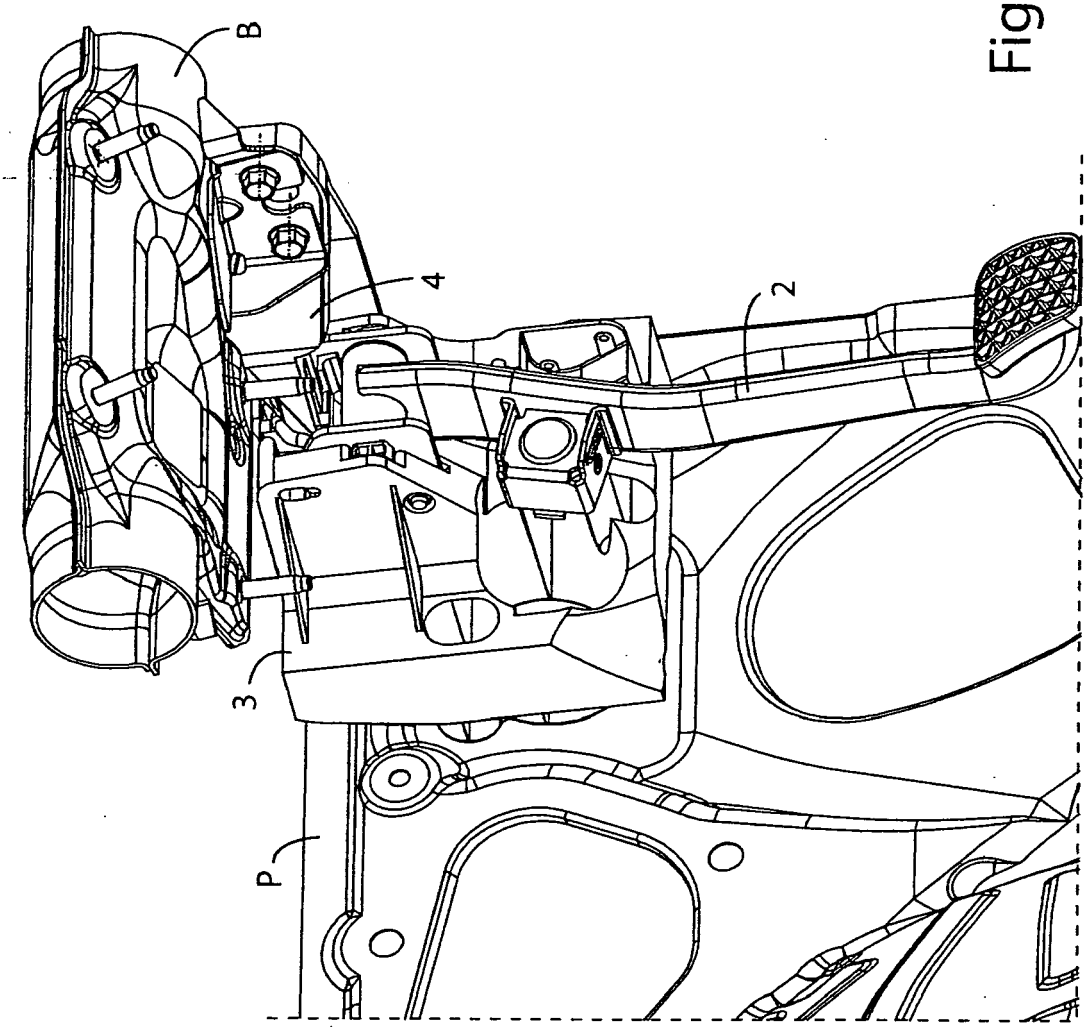

Fig. 1

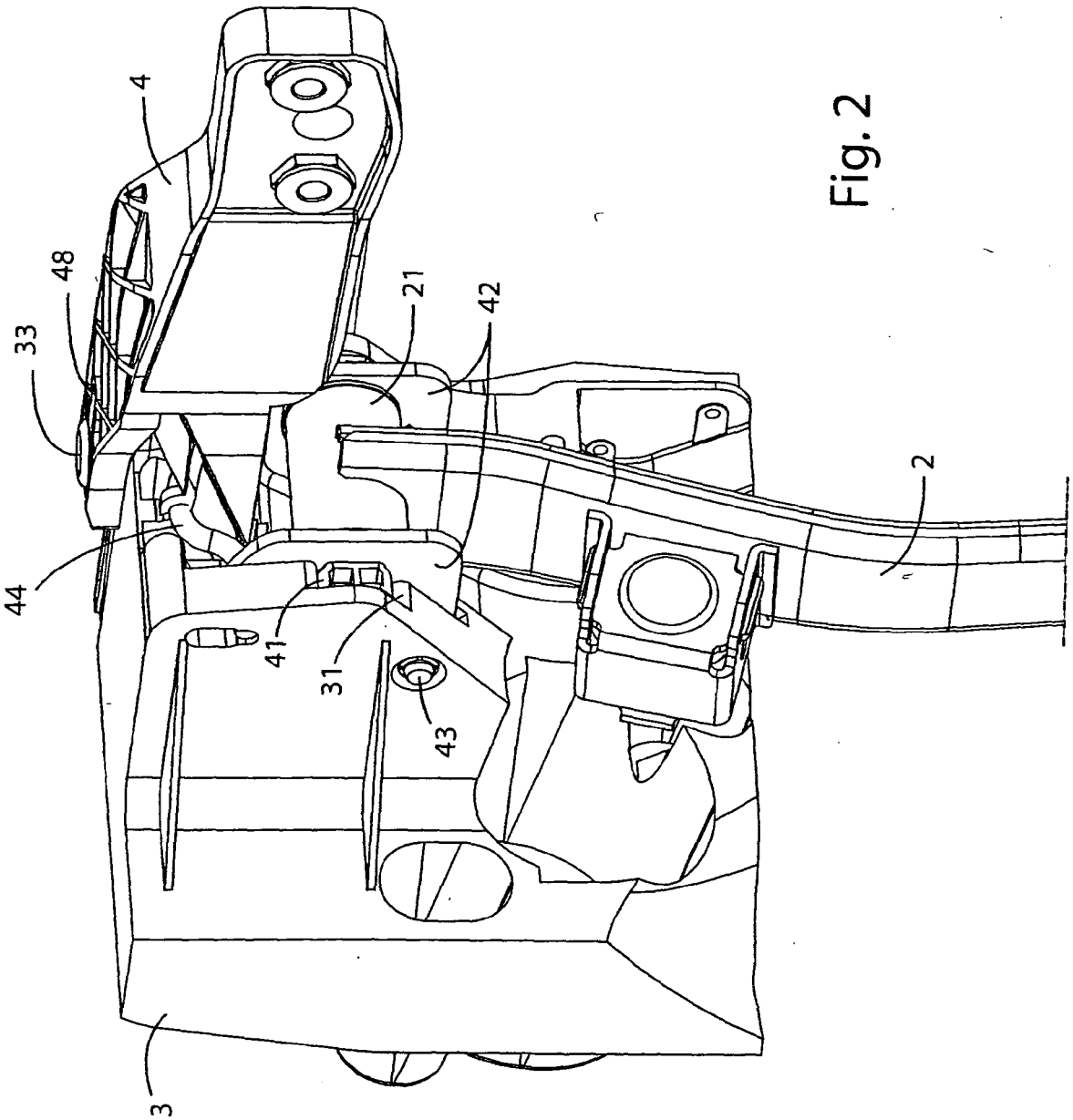

Fig. 2

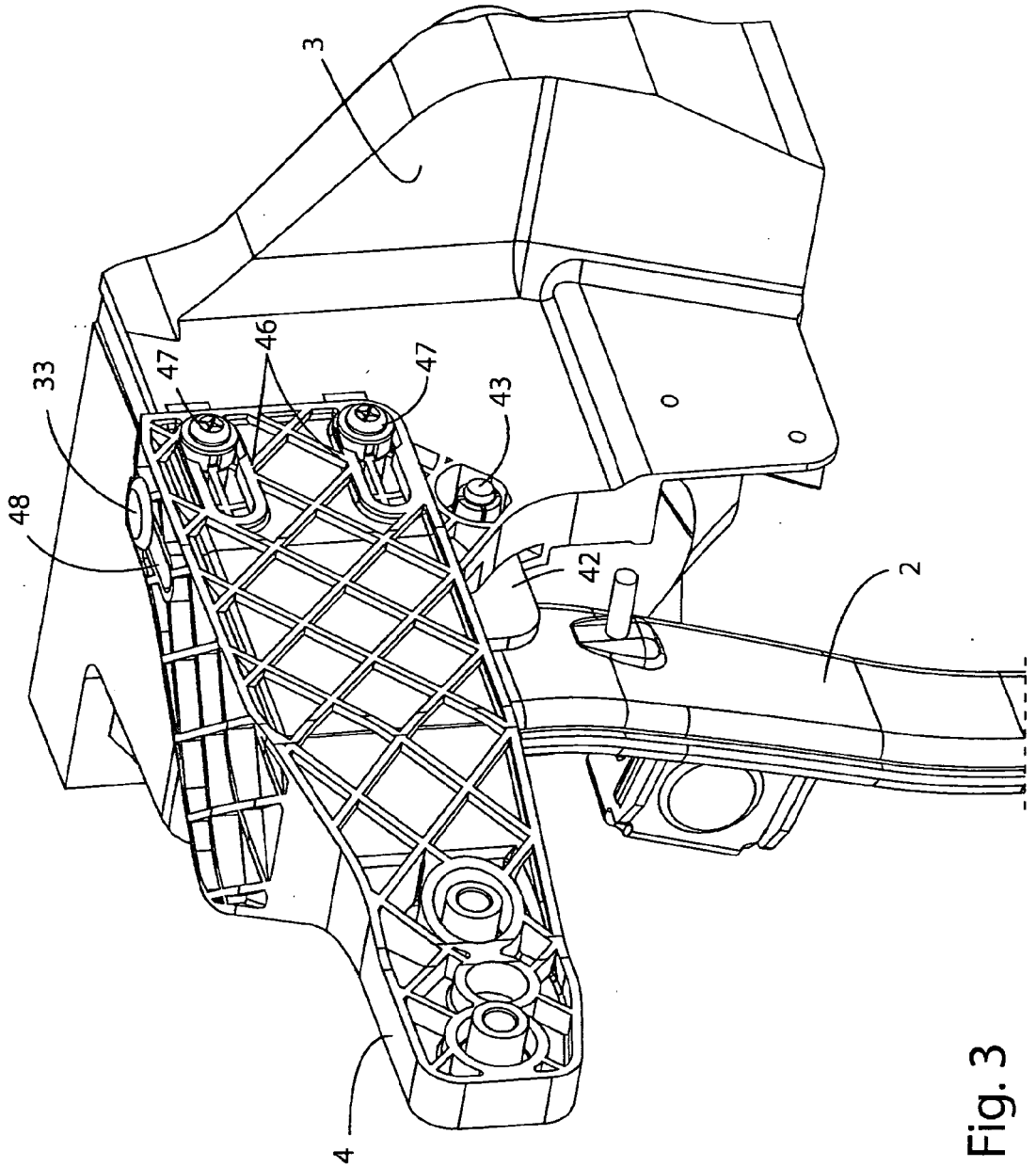

Fig. 3

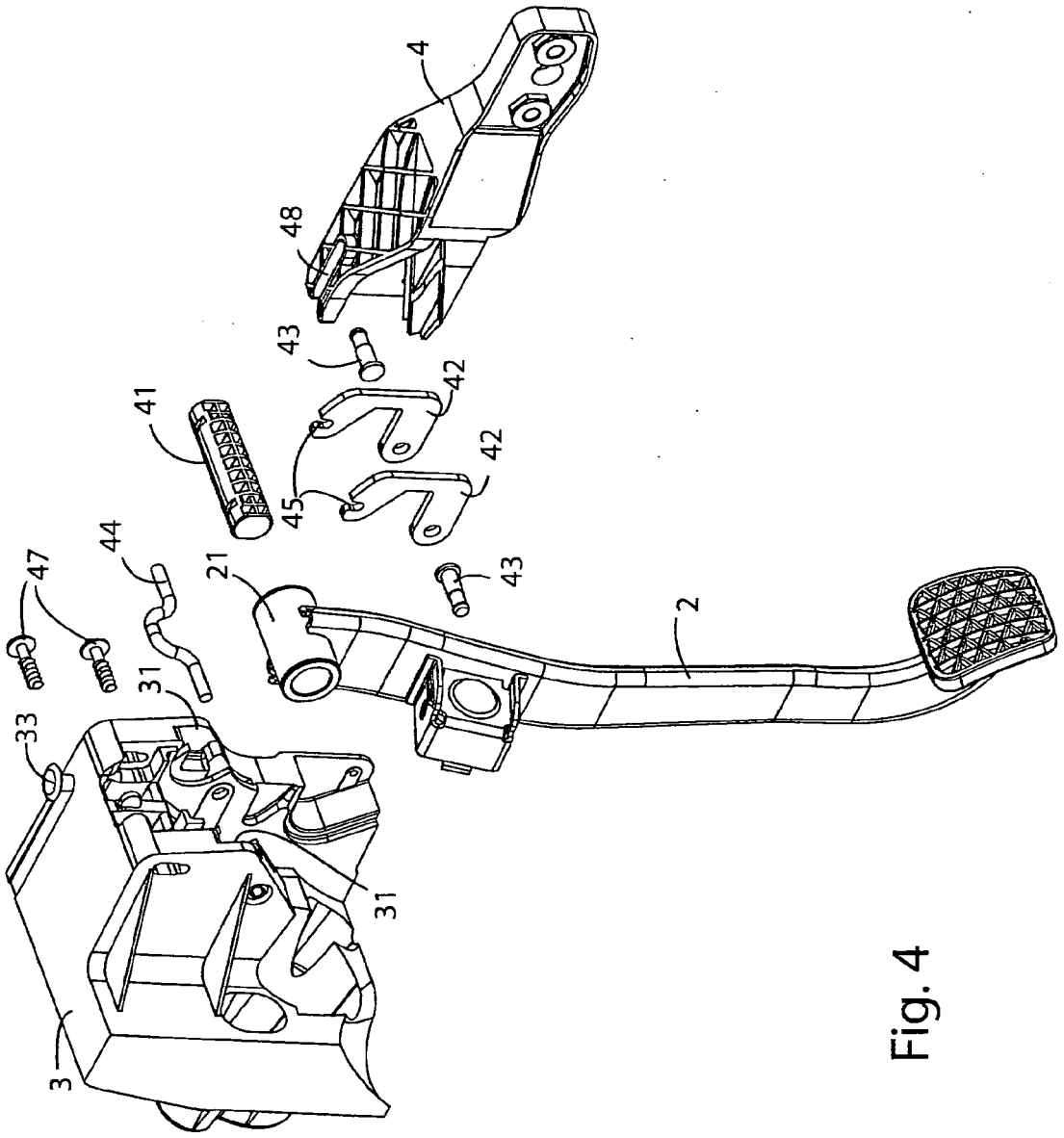

Fig. 4

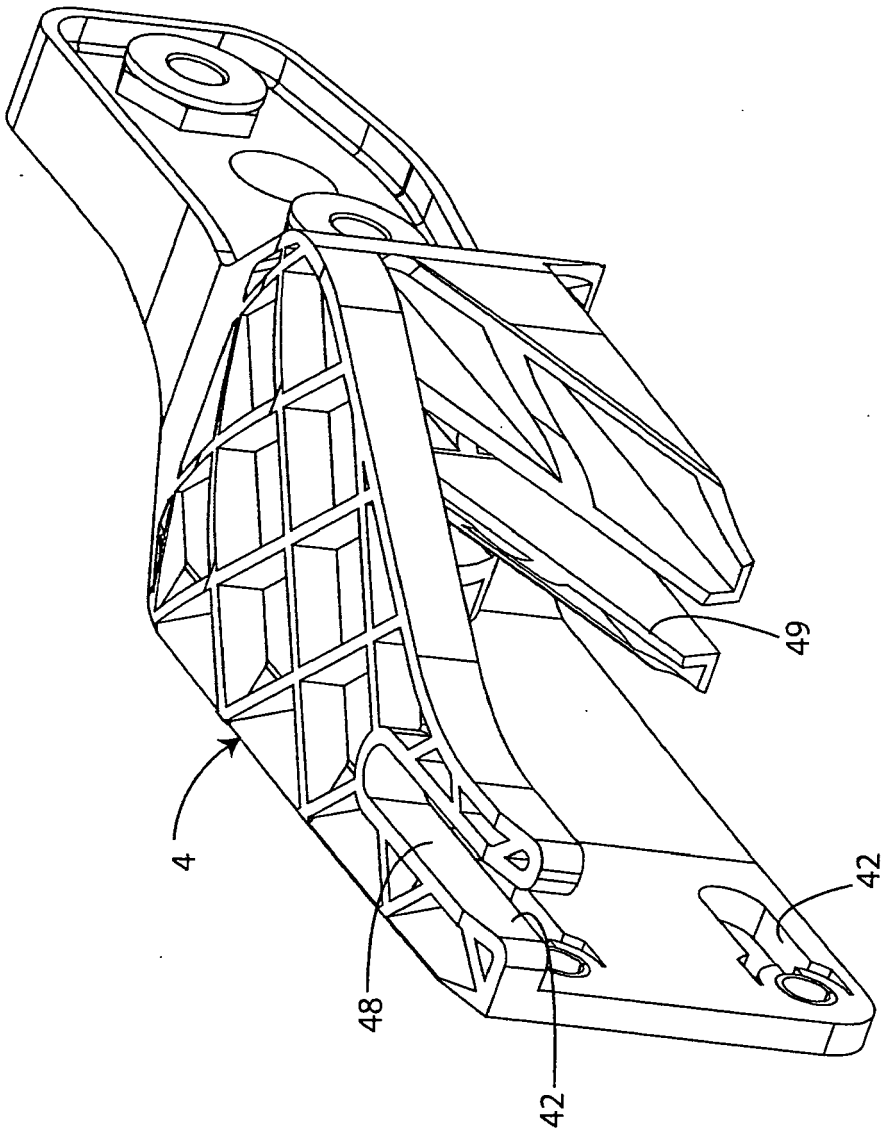

Fig. 5

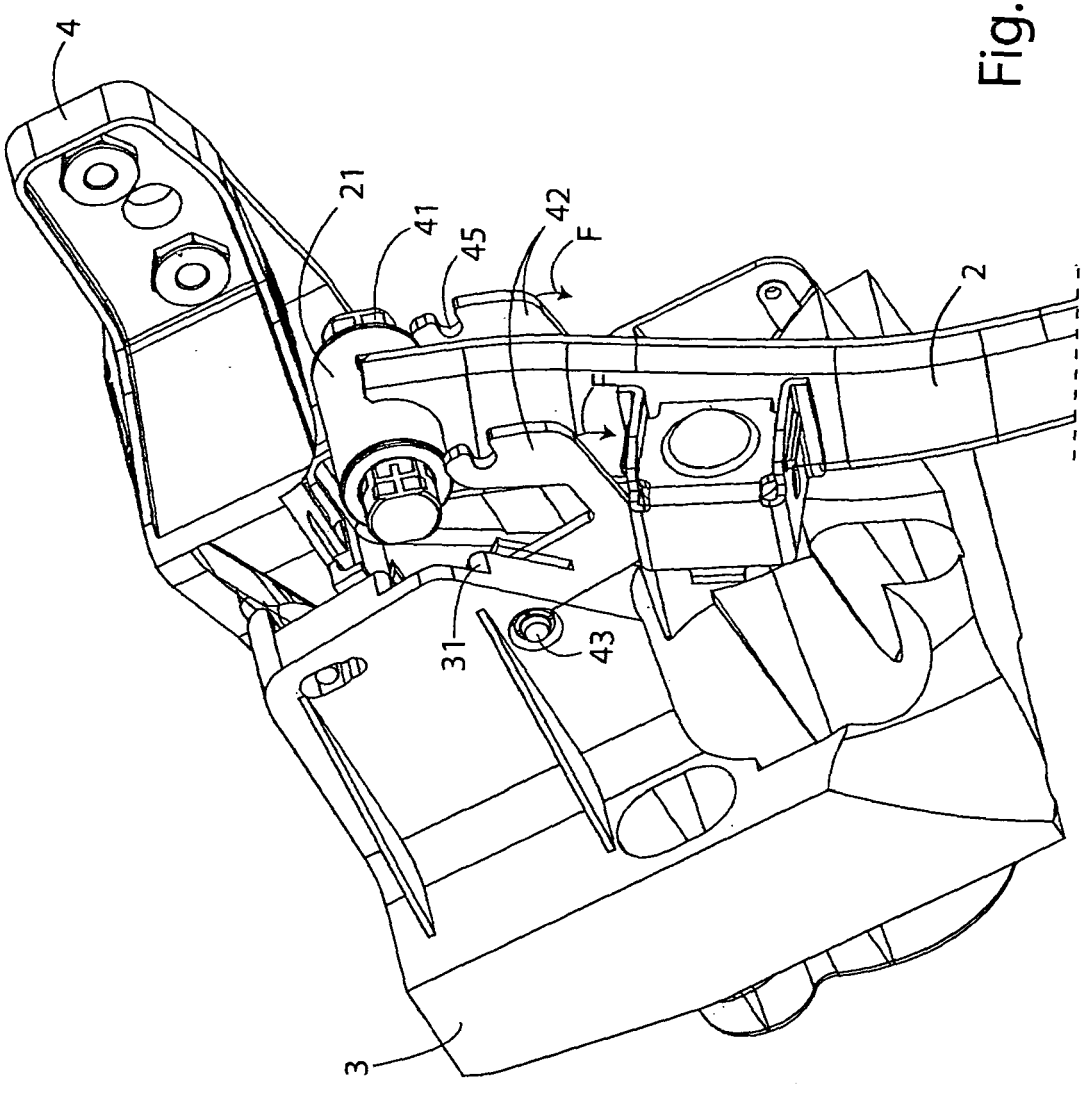

Fig. 6

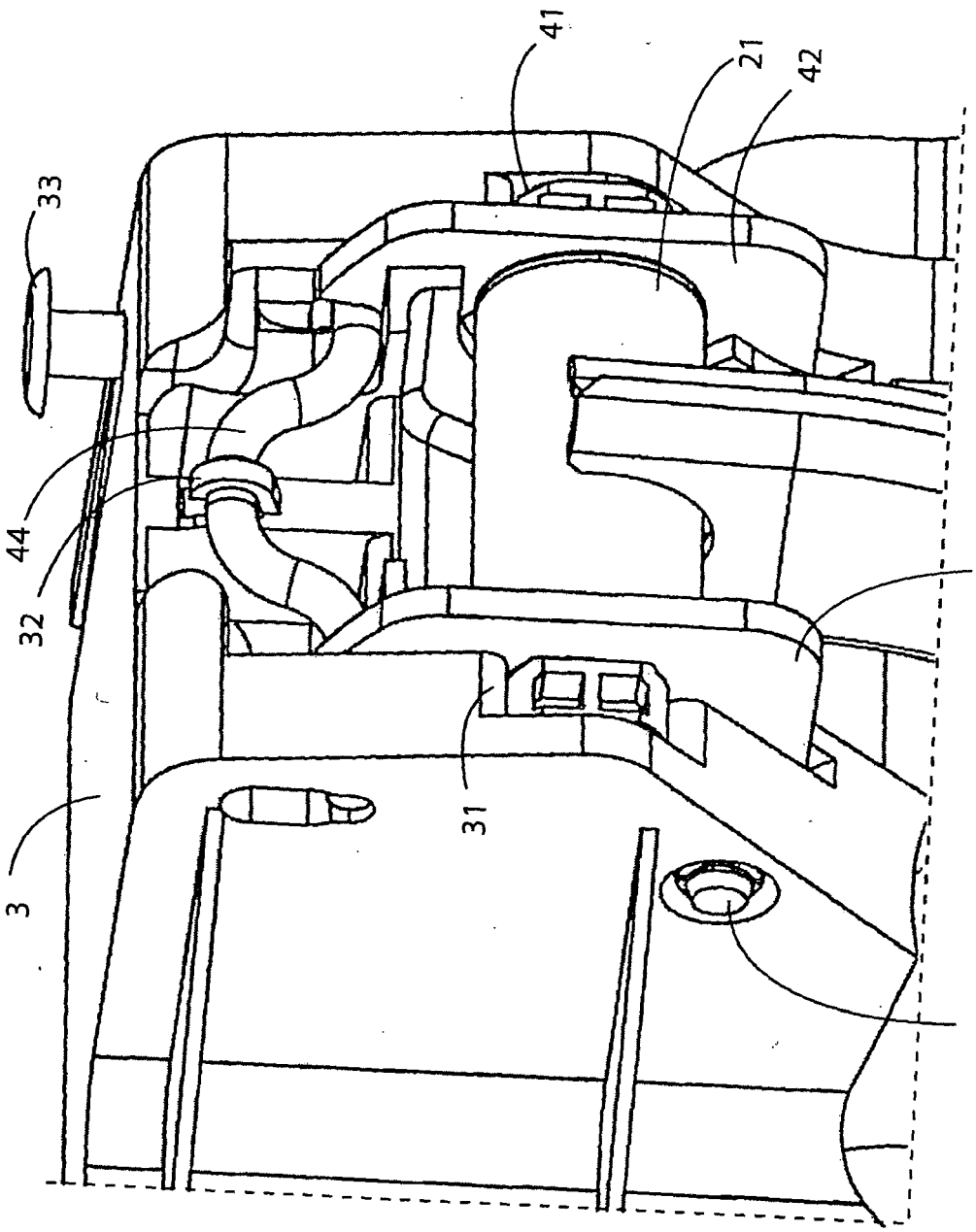

Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 09 01 2183

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2005/172754 A1 (STROLE MICHAEL C [US]) 11 August 2005 (2005-08-11) * paragraph [0019] - paragraph [0030]; figures *	1-8	INV. G05G1/327
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X	US 2003/019319 A1 (MIZUMA HIROYUKI [JP]) 30 January 2003 (2003-01-30) * abstract; figures *	1-4,8	
X	WO 02/051669 A1 (ZF LEMFOERDER METALLWAREN AG [DE]; BURGSTALER ANDREE [DE]; DUETZ JAN [) 4 July 2002 (2002-07-04)	1	TECHNICAL FIELDS SEARCHED (IPC)
A	* abstract; figures *	6	G05G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	9 December 2009	Popescu, Alexandru

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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