(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 099 821 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
16.05.2001 Bulletin 2001/20

(51) Int Cl.[7]: **E05C 17/50**

(21) Application number: **00660197.5**

(22) Date of filing: **10.11.2000**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **11.11.1999 FI 992433**

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(54) Retainer assembly for holding a vehicle door in opened position

(57) The invention relates to a retainer assembly for holding a door of a vehicle in an opened position, which retainer assembly comprises a frame member (2') to be supported by the body of the vehicle and to be fastened below said door, and an arm (1') which comprises a support part (4') for holding said door of the vehicle, which arm is turnably fastened to the frame member (2') by means of a joint means (5') and which, when the retainer assembly is in a locked position, is by means of a stop part (3') of the retainer assembly arranged to be at a first angle to the frame member in such a manner that the stop part prevents the arm (1') from turning to a second angle and thus holds said door of the vehicle in the opened position, which retainer assembly comprises releasing means (50', 51') for releasing the arm (1') from the stop part (3') in such a manner that the arm can be turned to the second angle with respect to the frame member (2') for setting the retainer assembly in a second position, in which it is when the door of the vehicle is closed. So as to make the retainer assembly easy to use and structurally simple, the stop part (3') is positioned in the frame member (2'), the support part (4') is arranged for a free support of said door of the vehicle, and the releasing means (50', 51') comprise a spring (51') whose springback power is arranged to hold the arm (1') against the frame member (2') and stop part (3'), whereby when the retainer assembly is in the locked position, the arm can be turned away from the frame member (2') against the springback force of the spring (51') to release the arm from the stop part (3') and to allow the turning of the arm from the first angle to the second angle for setting the retainer assembly to a second position which is a storage position of the retainer assembly.

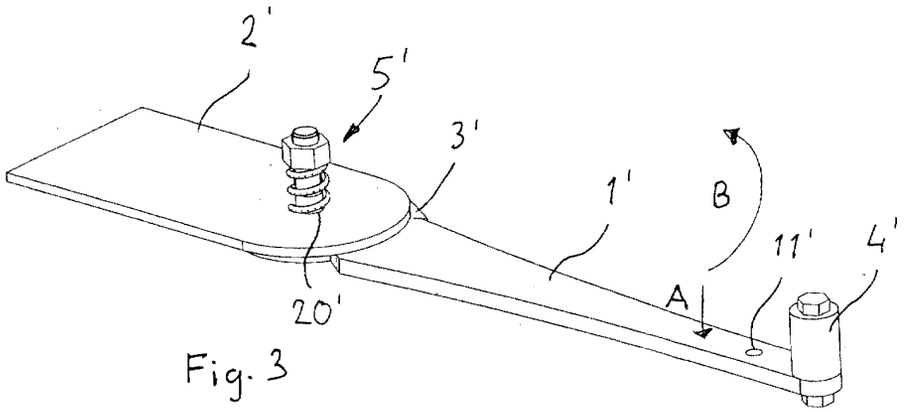

Fig. 3

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Description

BACKGROUND OF THE INVENTION

[0001] The invention relates to a retainer assembly for holding at least one door of a self-contained delivery vehicle or the like in an opened position, which retainer assembly comprises a frame member suspended from the body of the vehicle and fastened below said door and an arm which can be moved with respect to the frame member, which arm comprises a support part for holding said door, and which arm is turnably fastened to the frame member by means of a joint means comprising a pin-like fastening means and which arm, when the retainer assembly is in a locked position, is by means of a stop part arranged to be at a first angle to the frame member in such a manner that the stop part prevents the arm from turning from the first angle to a second angle and thus holds said door in the opened position, which retainer assembly comprises releasing means for releasing the arm from the stop part in such a manner that the arm suspended from the joint means can be turned to a second angle with respect to the frame member for setting the retainer assembly in a second position, in which it is when said door is closed.

[0002] The invention also relates to a combination of a vehicle and retainer assembly as claimed in the preamble of claim 5 appended hereto.

[0003] The retainer assembly of the invention is especially intended for use in holding open vehicle doors which comprise a long, elastic hinge extending the height of the door and tries by its springback force to turn the door from its opened position to a position where it is against the vehicle. When the vehicle is loaded or unloaded, the door(s) must be clearly open so that the door(s) do not hinder the loading or unloading. Said elastic hinges prevent the door from remaining in said opened position and therefore, the door must be held open by means of the retainer assembly during loading and unloading.

[0004] One known method of holding the doors open is using a chain. The chain is fastened at one end to the front wall (or rear profile) of a self-contained delivery vehicle and at the other end to a mounting on the outer surface of the door. Drawbacks of such a solution are that one must go behind the door/door package and that when installed on the front wall, the chain hangs down in such a manner that it can be easily damaged when it gets caught in a turning tow bar, for instance. When installed at the rear, the chain is in the way of driving lights and a possible hydraulic loading bridge. In a tractor vehicle, the cabin often prevents the installation of a chain.

[0005] A telescopic door retainer assembly which is fastened under the floor level is also known. This assembly comprises an outer tube and a retainer bar extending partly inside the tube, which retainer bar can be pulled outward from the outer tube against a springback force to set the retainer bar against the inner surface of an opened door/door package in order to prevent the closing of the door/door package. A drawback with this known retainer assembly is that it is difficult and heavy to use, which is due to having to push open the door/door package while pulling the retainer bar with great force against the springback force and turning the support part of the retainer bar against the inner surface of the door. A great pulling force is required, because the retaining force of the retainer assembly has to be at least equal to the springback caused by the door/door package. Another drawback of this known retainer assembly is that fingers get often caught when setting the assembly into its closed position and/or to its transport position. A yet further drawback is that when installed in a vehicle, the retainer assembly requires relatively much space in height below the floor of the vehicle, which is not desirable in a combination of a vehicle and a retainer assembly.

[0006] Published US patent 4339844 discloses an arm arrangement for holding a vehicle door in an opened position. The arm arrangement comprises two arms and three joints. The arm arrangement is fixed at one end to the body of the vehicle by means of a frame member belonging to the arm arrangement. The other end of the arm arrangement is also fixed to the inner surface of the vehicle door. The arm arrangement is located within the circumference of the door opening, thus preventing an unobstructed loading to and unloading of the vehicle. The structure of the arm arrangement is complex.

BRIEF DESCRIPTION OF THE INVENTION

[0007] It is an object of the invention to provide a new retainer assembly and combination of a self-contained delivery vehicle and retainer assembly, in which said problems are eliminated.

[0008] To achieve this, the retainer assembly of the invention is characterized in that the stop part is arranged to the frame member, the support part is arranged for freely holding said door, and the releasing means comprise a spring whose springback force is arranged to hold the arm against the frame member and the stop part, whereby when the retainer assembly is in its locked position, the arm can be turned away from the frame member against the springback force of the spring to release the arm from the stop part and to enable the turning of the arm from the first angle to the second angle for setting the retainer assembly in a second position which is a storage position of the retainer assembly.

[0009] One essential property of the retainer assembly is that it does not comprise a spring which would be loaded by the springback force of the door/door package.

[0010] Preferred embodiments of the retainer assembly of the invention are described in the appended claims 2 to 4.

[0011] The biggest advantages provided by the retainer assembly are that it is very easy to use and quite simple in structure, and it is not vulnerable to damage in its place of use. The retainer assembly is also not in the way when the vehicle is loaded or unloaded, but located outside the door opening. The force needed to turn the arm is very small: one must only exceed the force which holds the arm against the frame member. The door/door package does thus not load the spring very much. The fastening location of the retainer assembly in the body of the vehicle may vary especially in the longitudinal direction of the body, which enables its installation in different vehicles.

[0012] The combination of a self-contained delivery vehicle and the like and retainer assembly is characterized by what is stated in the appended claims 5 and 6. The biggest advantages provided by the combination are that it enables setting the door(s) easily in the open position, from which the door/door package cannot close when the vehicle is loaded or unloaded, and the retainer assembly is quite simple in structure. The vehicle can be loaded or unloaded without the retainer assembly being in the way at all.

BRIEF DESCRIPTION OF THE FIGURES

[0013] In the following, the invention will be described in greater detail by means of one preferred embodiment and with reference to the appended drawing, in which

Figure 1 shows a retainer assembly in a locked position and installed in a self-contained delivery vehicle,
Figure 2 shows the retainer assembly of Figure 1 in a transport position and installed in a self-contained delivery vehicle,
Figure 3 shows the retainer assembly of Figure 2 in a locked position,
Figure 4 shows the retainer assembly of Figure 3 in a storage position,
Figure 5 illustrates placing the retainer assembly of Figure 3 below the floor level of a self-contained delivery vehicle in the storage position shown in Figure 4,
Figures 6 and 7 show an arm of the retainer assembly of Figure 4 from the side and top, and
Figures 8 and 9 show a frame member of Figure 4 from the side and top.

DETAILED DESCRIPTION OF THE INVENTION

[0014] In Figure 1, the retainer assembly is installed at floor level, below a floor 10 of a self-contained delivery vehicle. The retainer assembly is in a locked position, in which it holds a side door 11 of a self-contained delivery vehicle open so that the springback force of a film-hinge-type hinge 12 extending over the entire height of the door 11 cannot turn the door to its closed position. The locked position can be called the active position of the retainer assembly. The retainer assembly comprises a plate-like frame member 2 fastened to the floor 11 for instance by welding, bolts or glue, and a turning plate-like arm 1 being connected to the frame member. The fastening is arranged to be below the top surface of the floor 10, in which case the retainer assembly is never in the way of the door opening. The frame member 2 and the arm 1 can easily be made of sheet steel by die-cutting. The arm 1 is fastened turnably to the frame member 2 by means of a pin-like joint means 5, preferably a bolt. In Figure 1, the inner surface of the door 11 supports itself freely to a support part 4 at the end of the arm 1 of the retainer assembly, and the arm 1 is at a first angle α, approximately 50°, with respect to the frame member 2. The retainer assembly can alternatively be fastened and/or its support part 4 can be fastened to the arm 1 (see drilling 31' in Figure 7) in such a manner that the support part 4 is positioned inside, i.e. on the left side of, a locking tongue 101 (with which the door is locked to the body of the vehicle) on the inner surface of the door 11 so that the edge of the door 11 supports itself freely against the support part 4. The locking tongue 101 can then support itself to the support part 4, which improves the support provided by the retainer assembly to the door. In the position of Figure 1, the arm 1 cannot turn so that the angle α is reduced and the door 11 allowed to close, which is due to the fact that the retainer assembly comprises a wedge-shaped stop part 3, against which a stop surface 6 of the arm 1 or any other retaining means supports itself (see Figure 7).

[0015] In Figure 2, the retainer assembly is in its storage position (i.e. "driving position"), which can be called its passive position. The arm 1 is then at a second angle β, approximately 90°, to the frame member. Figures 3 to 5 illustrate how the retainer assembly can be moved from the closed position of Figure 1 to the storage position of Figure 2.

[0016] Figures 3 to 5 show the retainer assembly of Figure 1 with the difference, however, that the retainer assembly of Figures 3 to 5 is intended to hold open doors turning to the left, whereas the structure of the retainer assembly of Figure 1 is such that it is intended to hold open doors turning to the right. The only structural difference in the retainer assemblies of Figures 1 and 3 is that the stop parts 3 and 3' respectively are fastened, typically welded, to different locations of the frame members 2, 2'.

[0017] So as to move the retainer assembly from the locked position of Figure 1 to the storage position of Figure 2, the arm 1 must be pressed downward, i.e. turned away from the frame member 2, see arrow A in Figures 3 and 5, and the arm must also be turned in the direction of arrow B, see Figure 3. A joint means 5' comprises a pin 50', around which a helical spring 51' is arranged, and which is at one end arranged to support itself to the frame member 2' and at the opposite end to a nut 52' at the end of the pin or to another support part known to a

person skilled in the art. The spring 51' holds the arm 1' normally against the frame member 2', but allows the tilting of the arm 1', i.e. turning it away from the frame member when pressing in the direction of arrow A. The tilting of the arm 1' is shown by angle γ in Figure 5. When the arm 1' is also turned in the direction of arrow B, the arm can be moved under and past the stop part 3', see Figures 3 and 5.

[0018] The frame member 2' has an opening 20' for the bolt 5' (pin 50'), the diameter of the opening being larger than the diameter of the bolt 5' (pin 50'), which enables the bolt and arm to move to a tilted position, i. e. angle γ, with respect to the frame 2', when the arm is pressed in the direction of arrow A. The head 53' of the bolt 5' can preferably freely support itself against the arm 1', i.e. the bolt 5' need not be fastened fixedly, for instance by welding, to the arm.

[0019] A support part 4' at the end of the arm 1' is fastened to a drilling 30' in the arm, see Figure 5. The support part 4' can alternatively be fastened to an additional drilling 31', depending on the application of the retainer assembly. There can typically and preferably be several additional drillings along the length of the arm 1.

[0020] Figure 5 shows that the retainer assembly is arranged in a slot-like space 100 formed in the floor 10 of the vehicle. The size of the space 100 located between the floor 10 and the door 11 is such that the bolt 5' or another joint means known to a person skilled in the art and the support part 4 fit into the space. Owing to the slot-like space 100, the retainer assembly is not in the way and is at the same time protected from possible mechanical impacts. The structure of the retainer assembly enables the turning of the bolt with respect to the frame member 2', i.e. its placing in the frame member 2' and arm 1' in such a manner that the head 53' of the bolt points (differing from Figure 5) towards the bottom surface of the floor 10 and the pin 50' with its spring 51' and nut 52' points away from the frame member 2' and the bottom surface of the floor. This type of a solution does not require a slot-like space 100 (groove) on the edge of the floor 10, but the pin 50' with its spring 51' and nut 52' may some applications be in the way and thus also vulnerable to damage from external impacts.

[0021] When the retainer assembly is in its storage position, the undefined planes of the arm 1' and frame member 2' are parallel, and the arm 1' supports itself against the frame member 2' through a large, circular bearing area, see Figures 4 and 7.

[0022] Figures 6 and 7 show that the arm 1 is a member resembling the hand of a clock in shape and comprises two symmetrical stop surfaces 6, 6' with respect to its longitudinal direction, which facilitates the assembling of the retainer assembly.

[0023] The invention has above been described by means of one example only and, therefore, it should be noted that the invention can be implemented in many ways within the scope of the appended claims. Thus, for instance the design and fastening location of the retainer assembly in the vehicle may vary. The vehicle need not be a self-contained delivery vehicle, but can be another type of a vehicle, for instance, a delivery vehicle comprising a partly closed freight space. It can be thought that the retainer assembly is fastened, instead of the floor, to the bottom end of a vertical post of the self-contained delivery vehicle, where it would fit due to its small size. Instead of a bolt, another joint means can be used. A bolt is, however, as a joint means structurally simple and inexpensive. The retainer assembly shown in the figure is, however, very advantageous in design, because the large bearing area of the assembly makes it very endurable. The stop part need not be wedge-shaped. In the example, the retainer assembly is described as used on only one door (door leaf) and therefore, it should be noted that the invention is especially well-suited for use in preventing door packages of vehicles, i.e. several doors (door leafs) fastened by a common hinge to the vehicle, from closing.

Claims

1. A retainer assembly for holding at least one door of a self-contained delivery vehicle or the like in an opened position, which retainer assembly comprises a frame member (2, 2') to be supported by the body of the vehicle and to be fastened below said door, and an arm (1, 1') which is movable with respect to the frame member, which arm comprises a support part (4, 4') for holding said door of the vehicle, and which arm is turnably fastened to the frame member (2, 2') by means of a joint means (5, 5') comprising a pin-like fastening means (50') and which arm, when the retainer assembly is in a locked position, is by means of a stop part (3, 3') of the retainer assembly arranged to be at a first angle (α) to the frame member in such a manner that the stop part prevents the arm (1, 1') from turning from the first angle (α) to a second angle (β) and thus holds said door in the opened position, which retainer assembly comprises releasing means (50', 51') for releasing the arm (1, 1') from the stop part (3, 3') in such a manner that the arm guided by the joint means (5, 5') can be turned to the second angle (β) with respect to the frame member (2, 2') for setting the retainer assembly in a second position, in which it is when said door is closed, **characterized** in that

   - the stop part (3, 3') is positioned in the frame member (2, 2'),
   - the support part (4, 4') is arranged for a free support of said door of the vehicle, and
   - the releasing means (50', 51') comprise a spring (51') whose springback power is arranged to hold the arm (1, 1') against the frame member (2, 2') and stop part (3, 3'), whereby when the retainer assembly is in the locked po-

sition, the arm can be turned away from the frame member (2, 2') against the springback force of the spring (51') to release the arm from the stop part (3, 3') and to allow the turning of the arm from the first angle (α) to the second angle (β) for setting the retainer assembly to a second position which is a storage position of the retainer assembly.

2. A retainer assembly as claimed in claim 1, **characterized** in that the spring is a helical spring (51') which surrounds a fastening element (50') and which at its one end is arranged to be supported by the frame member (2, 2') and on the opposite end it is arranged to be supported by a support part (52') formed on the fastening element.

3. A retainer assembly as claimed in claim 2, **characterized** in that the frame member (2, 2') and the arm (1, 1') are plate-like members and the fastening means (5, 5') is arranged in an opening (20, 20') which is formed in the frame member and has a diameter larger than the diameter of the fastening means so that the arm can be turned away from the frame member to a position, in which its plane is in a different plane than the plane of the frame member.

4. A retainer assembly as claimed in claim 3, **characterized** in that the support part (4, 4') is fastened to a drilling (30, 30') in the arm (1, 1'), and the arm comprises an additional drilling (31, 31') for fastening the arm alternatively to the additional drilling.

5. A combination of a self-contained delivery vehicle or the like and a retainer assembly, in which the self-contained delivery vehicle comprises a floor (10) and at least one door, and the retainer assembly is intended for holding said door in an opened position, which retainer assembly comprises a frame member (2, 2') supported by the body of the vehicle and fastened below said door, and an arm (1, 1') which is movable with respect to the frame member and which comprises a support part (4, 4') for holding said door and which is turnably fastened to the frame member (2, 2') by means of a joint means (5, 5') comprising a pin-like fastening means (50') and which, when the retainer assembly is in a locked position, is by means of a stop part (3, 3') arranged to be at a first angle (α) to the frame member in such a manner that the stop part prevents the arm (1, 1') from turning from the first angle (α) to a second angle (β) and thus holds said door in the opened position, which retainer assembly comprises releasing means (50', 51') for releasing the arm (1, 1') from the stop part (3, 3') in such a manner that the arm suspended from the joint means (5, 5') can be turned to the second angle (β) with respect to the frame member (2, 2') for setting the retainer assembly in a second position, in which it is when said door is closed, **characterized** in that

- the frame member (2, 2') is arranged below the top level of the floor (10),
- the stop part (3, 3') is arranged in the frame member (2, 2'),
- the support part (4, 4') is arranged for a free support of said door of the vehicle, and
- the releasing means (50', 51') comprise a spring (51') whose springback power is arranged to hold the arm (1, 1') against the frame member (2, 2') and stop part (3, 3'), whereby when the retainer assembly is in the locked position, the arm can be turned away from the frame member (2, 2') against the springback force of the spring (51') to release the arm from the stop part (3, 3') and to allow the turning of the arm from the first angle (α) to the second angle (β) for setting the retainer assembly to a second position which is the storage position of the retainer assembly.

6. A combination as claimed in claim 5, **characterized** in that the floor comprises a slot-like space (100) for the arm (1, 1') and the support part (4, 4') so that the arm and the support part settle substantially between the top level and bottom level of the floor when the retainer assembly is in the storage position.

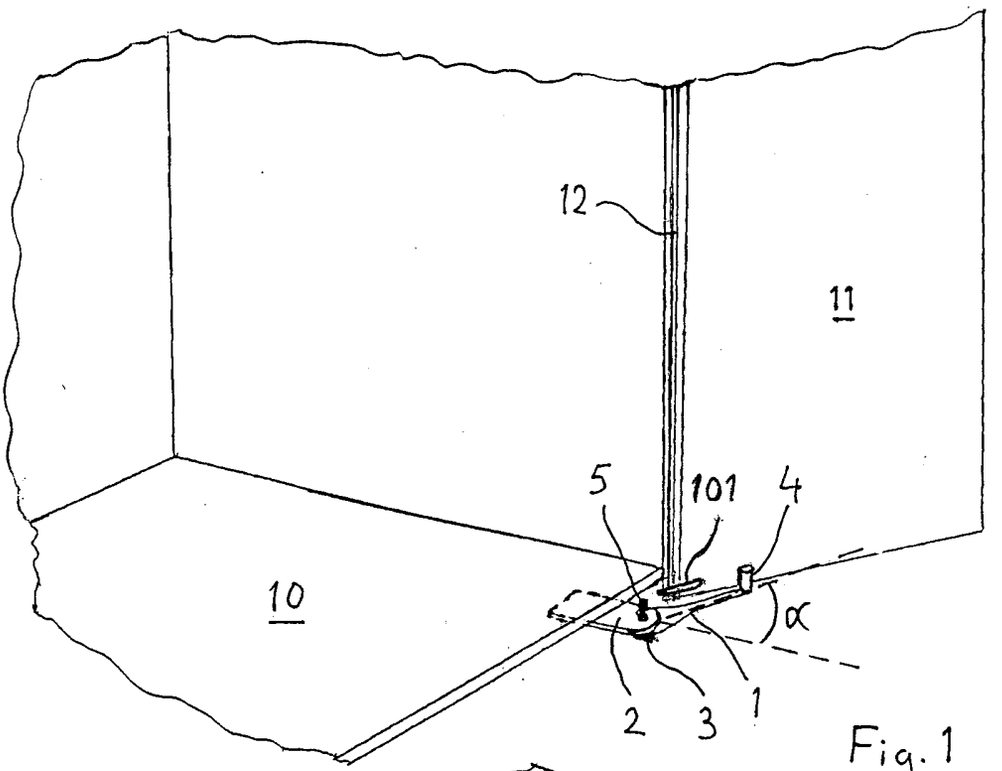

Fig. 1

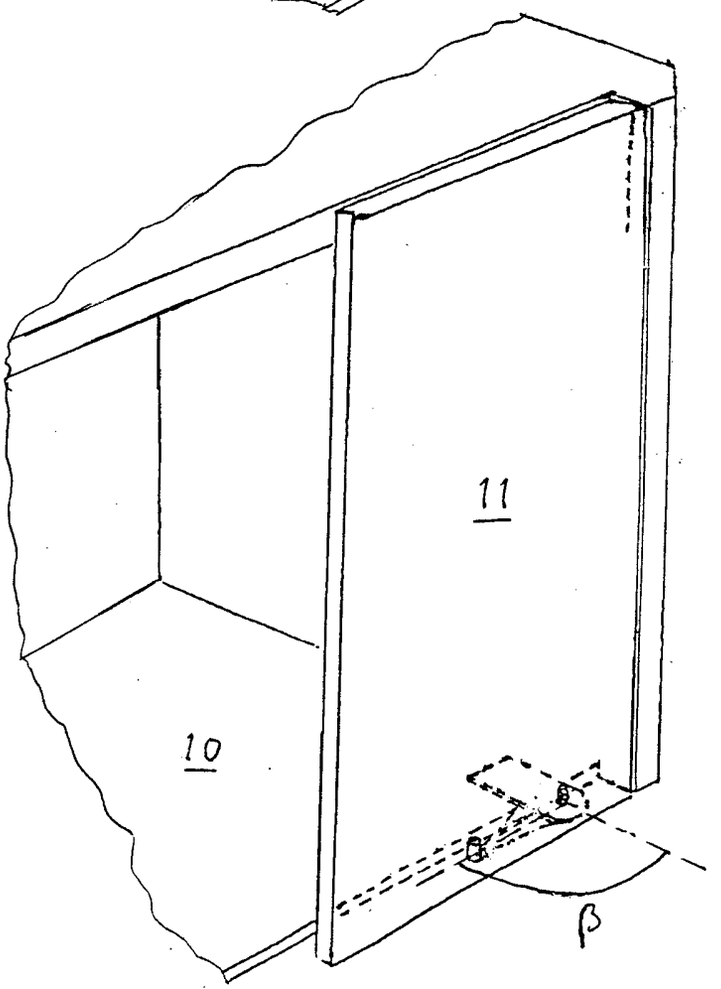

Fig. 2

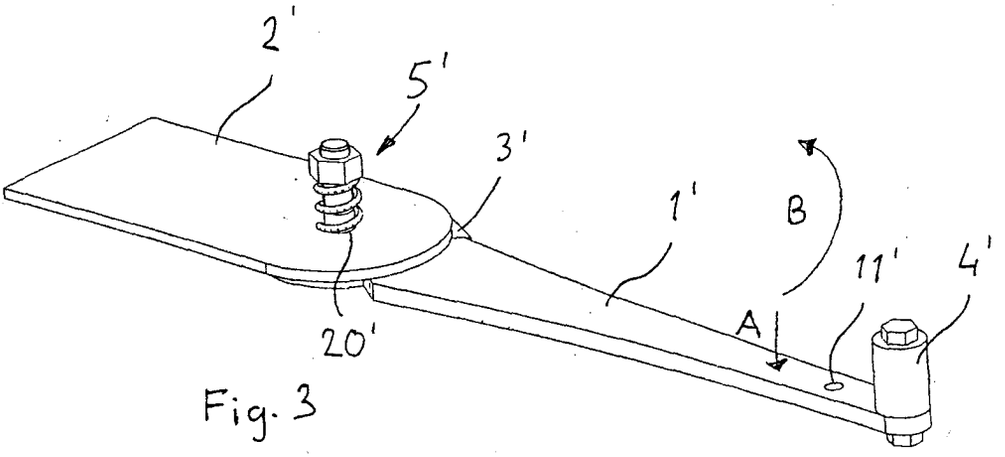

Fig. 3

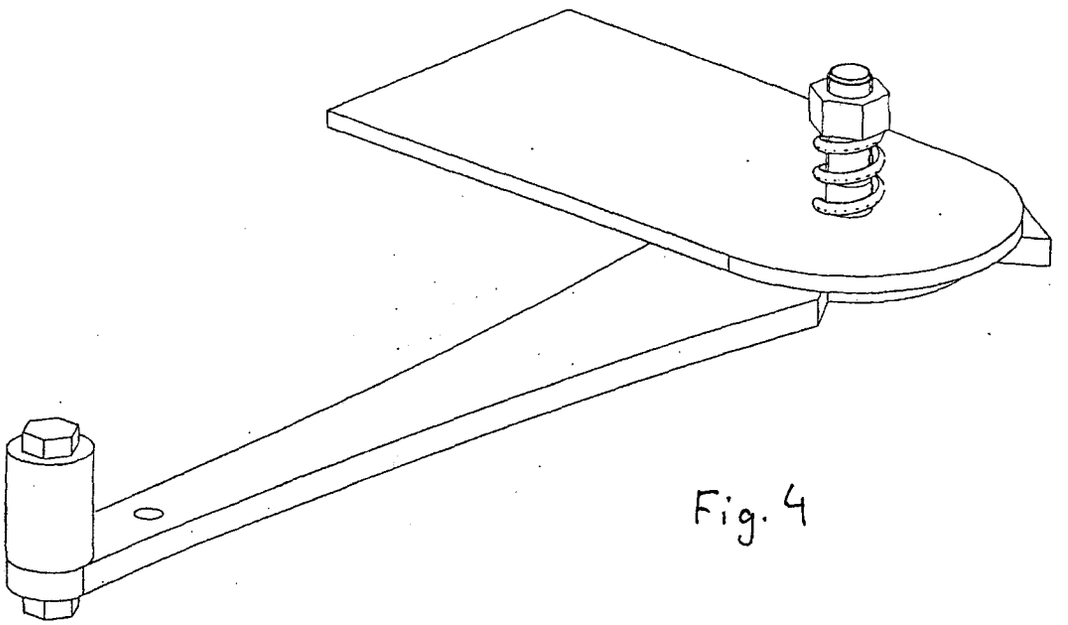

Fig. 4

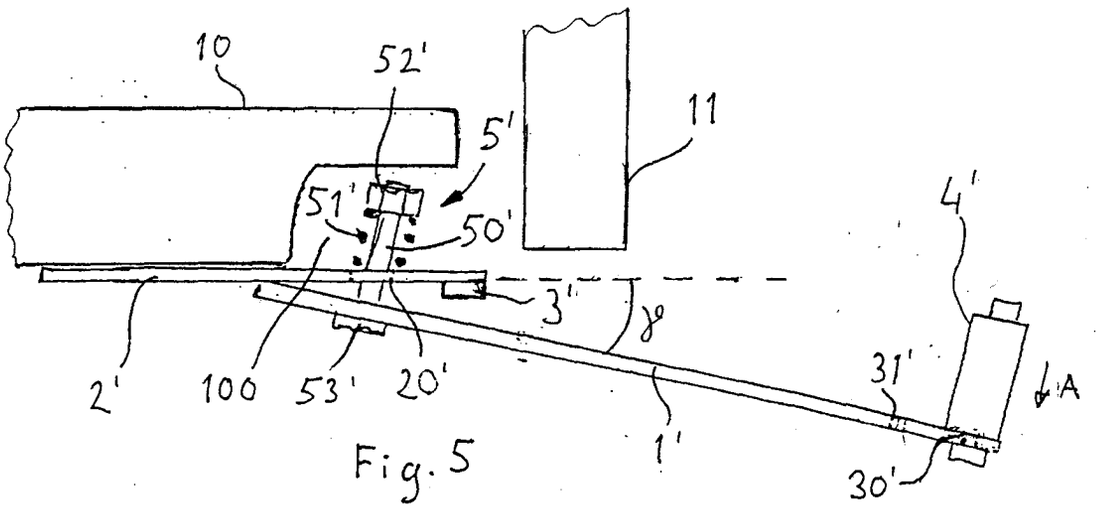

Fig. 5

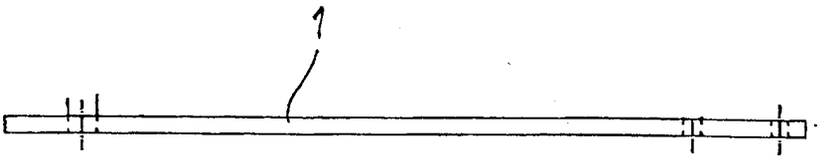

Fig.6

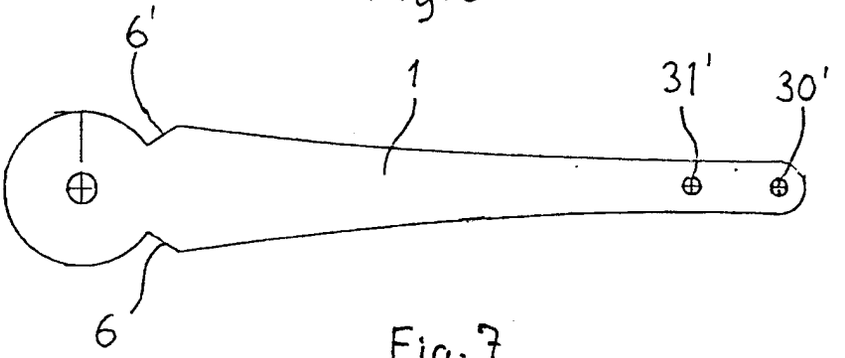

Fig.7

Fig.8

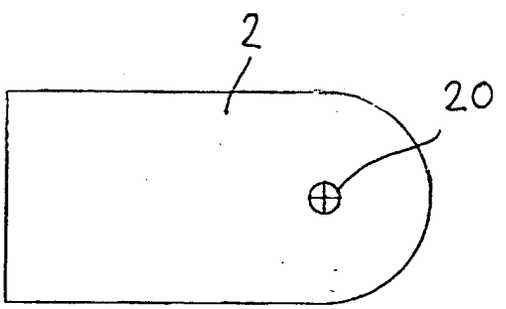

Fig.9

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 66 0197

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	EP 0 479 663 A (POMMIER & CIE) 8 April 1992 (1992-04-08) * the whole document *	1,5	E05C17/50
A	FR 2 764 627 A (LAMBERET CONSTRUCTIONS ISOTHERMES SA) 18 December 1998 (1998-12-18) * the whole document *	1,5	
A,D	US 4 339 844 A (SHATTERS) 20 July 1982 (1982-07-20) * the whole document *	1,5	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E05C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	14 February 2001	Van Beurden, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 66 0197

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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14-02-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0479663 A	08-04-1992	FR 2667344 A	03-04-1992
		AT 119618 T	15-03-1995
		DE 69107947 D	13-04-1995
		DE 69107947 T	27-07-1995
		DE 479663 T	03-09-1992
		ES 2031444 T	16-12-1992
FR 2764627 A	18-12-1998	NONE	
US 4339844 A	20-07-1982	NONE	