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(54) **Locking device applied to an awning**

(57) Comprises a body (7) defining:
- a converging-diverging double-funnel assembly (8) connected to a guide (6) through which it moves a cam follower (12) joined to an arm (13) assembled on a load bar (5) fixed to a piece of canvas (1);
- a retention assembly (9) to retain the cam follower (12) with said piece of canvas (1) under tension in a partially or fully extended position;
- an interlock cam guide (10) and an escape cam guide (11) to respectively lead, following a descending-ascending path, the cam follower (12) from the double-funnel assembly (8) to said retention assembly (9) and vice versa,

said retention assembly (9) comprising a detachable retainer (54) blocking a freeing passage (55) arranged to lead the cam follower (12) directly from the retention assembly (9) to the double-funnel assembly (8) without following said descending-ascending path.

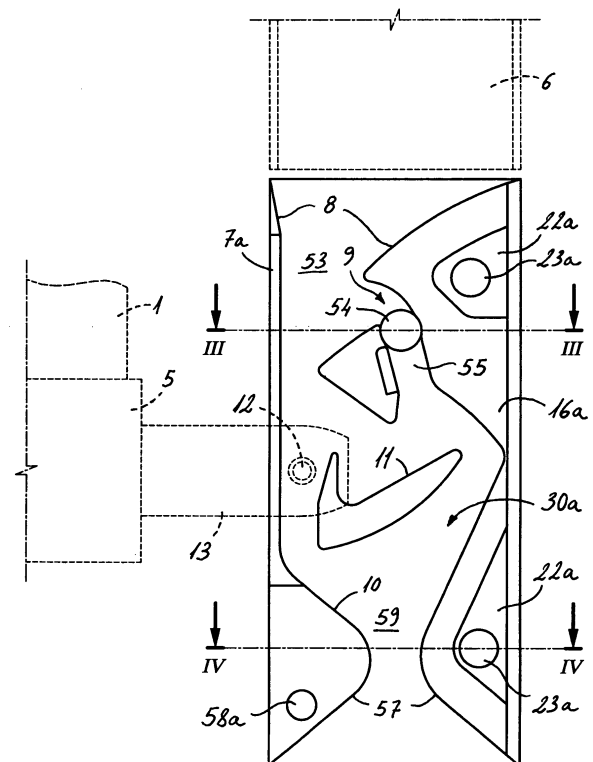


Fig.2

Description

Field of the invention

[0001] The present invention relates to a locking-freeing device applied to a vertical awning, and more particularly to a labyrinth-type locking-freeing device for supporting the load bar of a vertical awning in a predetermined position and for the release thereof.

Prior State of the Art

[0002] European patent EP-A-1 577 458, belonging to the current applicant, discloses a vertical awning of the type comprising a piece of canvas that can be rolled and unrolled on a rolling tube. Fixed at a free end of the mentioned piece of canvas there is a load bar at the ends of which respective arms are telescopically assembled which end in respective cam followers which move through corresponding vertical guides. The load bar keeps the piece of canvas relatively taut due to gravity during the movements between an extended position and a folded position. To fix the load bar in the extended position, the awning includes for each end of the load bar a locking-freeing device comprising at an upper part a converging-diverging double-funnel assembly in connection with the corresponding vertical guide through which the cam follower moves, said double-funnel assembly defining an entry-exit passage for said cam follower. A retention assembly is located below said double-funnel assembly which is able to retain the cam follower with said piece of canvas under tension in an extended position. The device includes an interlock cam guide arranged to lead the cam follower from the double-funnel assembly to said retention assembly following a descending-ascending path, and an escape cam guide arranged to lead the cam follower from the retention assembly to the double-funnel assembly following a descending-ascending path.

[0003] Therefore, to fix the load bar in the extended position, the cam followers are moved downwards below the double-funnel assemblies and further under the retention assemblies, and then they are moved upwards until they enter and get retained in the retention assemblies. To free the load bar, the cam followers are moved downwards, further under the retention assemblies and then are moved upwards through the double-funnel assemblies such that they can continue through the vertical guides until the load bar is in the folded position. One problem is that when it is windy and the awning is to be folded, when the operation to unroll the piece of canvas begins, the latter inflates and the load bar does not move downwards due to gravity to free the cam followers from their respective retention assemblies, therefore making the folding operation difficult.

Description of the Invention

[0004] One objective of the present invention is to provide a locking-freeing device applied to a vertical awning provided with means enabling the freeing of the load bar in certain cases, for example when it is windy.

[0005] The present invention contributes to reaching this objective and others by providing a locking-freeing device applied to a vertical awning, of the type comprising a body defining a converging-diverging double-funnel assembly in connection with a guide through which a cam follower moves, which cam follower is joined to an arm telescopically assembled on one end of a load bar fixed to a piece of canvas of said vertical awning, said double-funnel assembly defining a passage for said cam follower; a retention assembly located under said double-funnel assembly and which is able to retain the cam follower with said piece of canvas under tension in a partially or fully extended position; an interlock cam guide arranged to lead the cam follower from the double-funnel assembly to said retention assembly following a descending-ascending path; and an escape cam guide arranged to lead the cam follower from the retention assembly to the double-funnel assembly following a descending-ascending path. The device of the present invention is characterized in that said retention assembly comprises a detachable retainer blocking a freeing passage arranged to lead the cam follower directly from the retention assembly to the double-funnel assembly without following said descending-ascending path, said detachable retainer being assembled such that it can be accessed and withdrawn from an outer side of said body to leave said freeing passage clear.

[0006] With this construction, when the piece of canvas inflates for any reason, for example due to the wind, preventing the downward movement of the load bar, and with it the freeing of the cam followers from their corresponding retention assemblies, the previously mentioned detachable retainers can be easily removed from the outside so as to allow the cam followers to pass upwards through said freeing passages towards the double-funnel assemblies and above the vertical guides. Once the load bar has been freed, the detachable retainers can be placed in their operative position again quickly and easily.

Brief Description of the Drawings

[0007] These and other advantages and features will be fully understood from the following detailed description of an embodiment in reference to the attached drawings in which:

Figure 1 is a perspective view of two substantially symmetrical pieces to be placed together to form a body and a detachable retainer forming part of a locking-freeing device according to an embodiment of the present invention;

Figure 2 is a plan view of an inner face of one of the two substantially symmetrical pieces of Figure 1; Figure 3 is a cross-section view of the device according to section line III-III of Figure 2; and Figure 4 is a cross section view of the device according to section line IV-IV of Figure 2.

Detailed Description of an Embodiment

[0008] The locking-freeing device of the present invention can be applied to a vertical awning of the type comprising a piece of canvas 1 (shown with dotted lines in Figure 2) fixed at one end to a rolling tube (not shown) and at another end to a load bar 5 having an arm 13 telescopically assembled on each end (Figure 4). A cam follower 12 projects out from both sides of a free end of each of said arms, which cam follower 12 moves through a corresponding guide 6 (shown with dotted lines in Figure 2) when the load bar 5 moves vertically up and down as a result of the rolling or unrolling of the piece of canvas 1 around the rolling bar. Both guides 6 define vertical grooves which are mutually and parallelly opposing, and at the end of the grooves, or in intermediate positions, respective locking-freeing devices are arranged which are designed to automatically lock the load bar 5 in a predetermined position and to subsequently free it.

[0009] As is shown in Figure 1, each locking-freeing device according to an embodiment of the present invention comprises a body 7 formed by two substantially symmetrical pieces 7a, 7b which are mutually placed against and joined to one another in the operational arrangement, as seen in Figures 3 and 4. These two pieces 7a, 7b have respective opposing inner planar faces 16a, 16b where opposing symmetrical recesses 30a, 30b are formed which define assemblies that will be described in more detail below in relation to Figure 2. Respective projections 22a, 22b project out from the mentioned inner planar faces 16a, 16b, which projections 22a, 22b in the operational arrangement support one another. These projections 22a, 22b are traversed by respective mutually aligned holes 23a, 23b. As shown in Figure 4, locking assemblies are installed through said holes 23a, 23b consisting of a screw and nut 27, 28 so as to firmly join the two pieces 7a, 7b together. A gap 29 is formed between the inner planar faces 16a, 16b for the passage of the arm 13 (Figure 4) so that the cam follower 12 can be inserted into said opposing symmetrical recesses 30a, 30b and move through them during upward and downward vertical movements of the load bar 5. As the cam follower 12 moves through the recesses 30a, 30b the arm 13 moves inwardly and outwardly from the load bar 5 according to the course of such recesses 30a, 30b.

[0010] Figure 2 shows the assemblies defined by recesses 30a, 30b in pieces 7a, 7b forming each body 7. First, there is, in the upper part of the body 7, a converging-diverging double-funnel assembly 8 in connection with the corresponding vertical guide 6 through which a cam follower 12 moves. This double-funnel assembly 8

defines an entry-exit passage 53 for said cam follower 12. A retention assembly 9 is located under the double-funnel assembly 8 that is able to retain the cam follower 12 with said piece of canvas 1 under tension in a fully extended position if the locking-freeing devices are at the end of the guides 6, or in a partially extended position if the locking-freeing devices are at intermediate positions of the guides 6. Assembled under said retention assembly 9 there is an interlock cam guide 10 to lead the cam follower 12 from the double-funnel assembly 8 to said retention assembly 9 following a descending-ascending path, and an escape cam guide 11 to lead the cam follower 12 from the retention assembly 9 to the double-funnel assembly 8 following a descending-ascending path.

[0011] In the embodiment shown in the figures, the two pieces 7a, 7b include stops 58a, 58b projecting out from the inner planar faces 16a, 16b to interfere with the arms 13 for the purpose of limiting the path of the load bar 5 when the locking-freeing devices are arranged at the end of the guides 6. Obviously, a single stop on one of the two pieces 7a, 7b would be enough. Optionally arranged under the mentioned interlock and escape cam guides 10, 11 there is another converging-diverging double-funnel assembly 57 in connection with another section of the corresponding vertical guide 6 (not shown). This second double-funnel assembly 57 defines an entry-exit passage 59 for said cam follower 12 in the lower part of the body 7 when the locking-freeing devices are located in intermediate positions of the guides 6, in which case the mentioned stops 58a, 58b are eliminated, as can be seen in Figure 4.

[0012] The essential feature of the present invention is that said retention assembly 9 comprises a detachable retainer 54 (also see Figures 1 and 3) blocking a freeing passage 55. The mentioned detachable retainer 54 is assembled such that it can be accessed and can be withdrawn from an outer side of said body 7 so as to leave said freeing passage 55 clear, which passage is arranged to lead the cam follower 12 directly from the retention assembly 9 to the double-funnel assembly 8 without needing to following the mentioned descending-ascending path, which is useful in certain cases, for example when it is windy.

[0013] As is best shown in Figure 3, respective mutually aligned holes 56a, 56b are formed in pieces 7a, 7b and are located in said freeing passage 55 and adapted to receive the insertion of the detachable retainer 54 such that a portion thereof intercepts the freeing passage 55. At least one of said holes 56a in one of the two pieces 7a is a through hole so as to allow the detachable retainer 54 to be inserted from an outer side of this piece 7a forming part of the body 7. The detachable retainer 54 includes a projecting portion defining a handle 54a, a portion with outer threads 54b, adjacent to said handle 54a, adapted to be coupled to a portion with inner threads of the first of said holes 56a on one of the pieces 7a, and an end portion 54c adapted to be inserted in the second

of the holes 56b in the other piece 7b. Therefore, the detachable retainer 54 is firmly fixed to the body 7 and the outer threads are protected from possible damage that may be caused by the arm 13 or cam follower 12. If needed, the detachable retainer 54 can be easily disassembled using the handle 54a and withdrawn from the body 7 so as to allow the passage of the cam follower 12 from the retention assembly 9 directly to the double-funnel assembly 8 through the freeing passage 55. The detachable retainer 54 can be arranged again with the same ease in its operative position in the body 7.

[0014] Obviously, the second hole 56b in the second of the pieces 7b and an end portion 54c of the detachable retainer 54 could be omitted although it would be at the expense of reducing the resistance of the support of the detachable retainer 54.

[0015] A person skilled in the art will be able to introduce variations and modifications in the embodiment shown and described without departing from the scope of the present invention as it is defined in the attached claims.

Claims

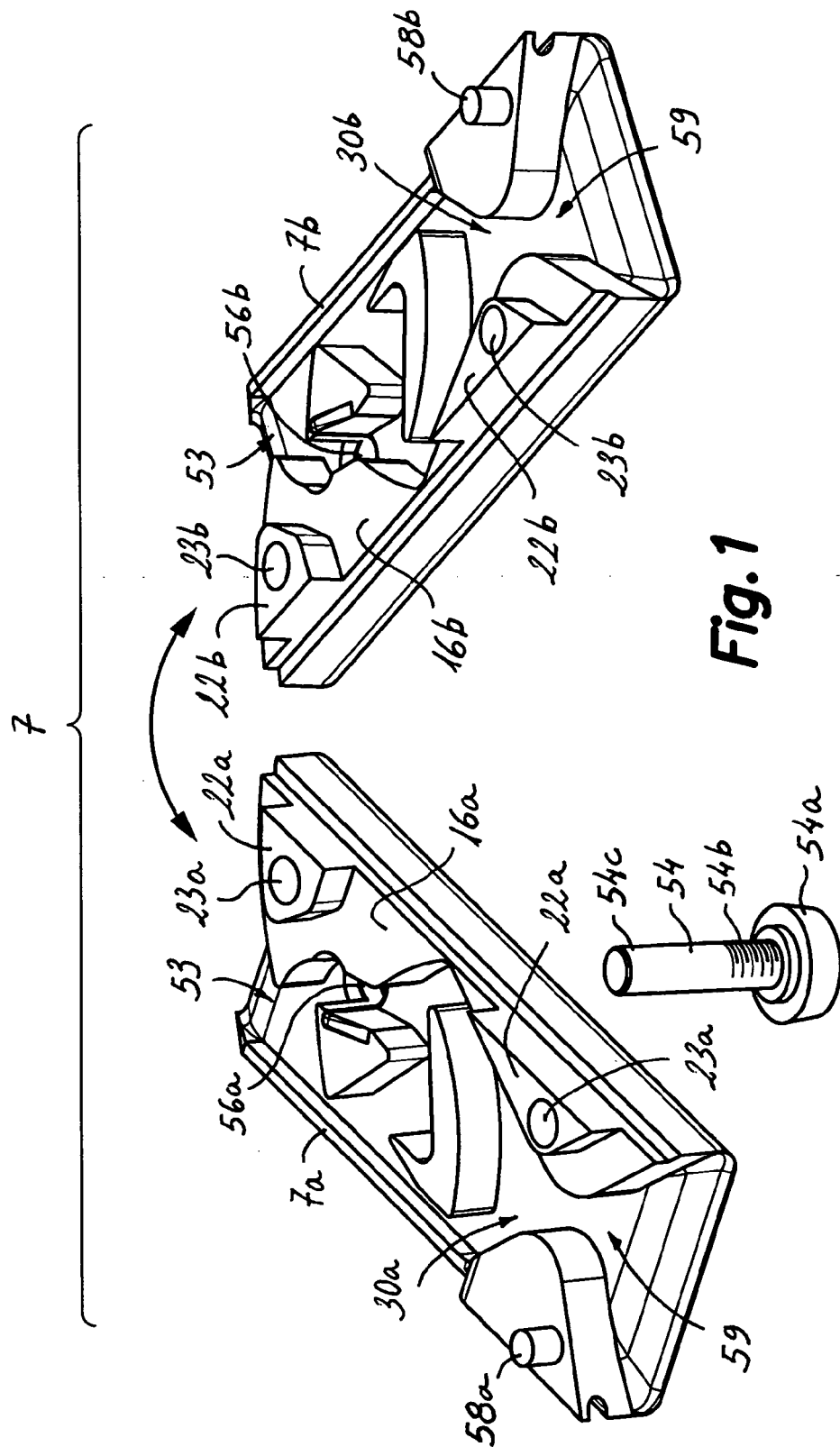
1. A locking-freeing device applied to a vertical awning, of the type comprising a body (7) defining:

- a converging-diverging double-funnel assembly (8) in connection with a guide (6) through which a cam follower (12) moves which is joined to an arm (13) telescopically assembled on one end of a load bar (5) fixed to a piece of canvas (1) of said vertical awning, said double-funnel assembly (8) defining an entry-exit passage (53) for said cam follower (12);
- a retention assembly (9) located under said double-funnel assembly (8) and able to retain the cam follower (12) with said piece of canvas (1) under tension in a partially or fully extended position;
- an interlock cam guide (10) arranged to lead the cam follower (12) from the double-funnel assembly (8) to said retention assembly (9) following a descending-ascending path; and
- an escape cam guide (11) arranged to lead the cam follower (12) from the retention assembly (9) to the double-funnel assembly (8) following a descending-ascending path,

characterized in that said retention assembly (9) comprises a detachable retainer (54) blocking a freeing passage (55) arranged to lead the cam follower (12) directly from the retention assembly (9) to the double-funnel assembly (8) without following said descending-ascending path, said detachable retainer (54) being assembled such that it can be accessed and withdrawn from an outer side exterior of said

body (7) so as to leave said freeing passage (55) clear.

2. A device according to claim 1, **characterized in that** the body (7) is formed by two substantially symmetrical pieces (7a, 7b) placed against one another having respective opposing inner planar faces (16a, 16b) where opposing symmetrical recesses (30a, 30b) are formed which define said double-funnel and retention assemblies (8, 9) and interlock and escape cam guides (10, 11), and projecting out from which there are respective projections (22a, 22b) supporting one another, a first through hole (56a) being formed in at least one of said two pieces (7a) so as to receive the insertion of the detachable retainer (54) from an outer side of said piece (7a) forming part of the body (7).
3. A device according to claim 2, **characterized in that** a second through hole (56b) is formed in the other one of said two pieces (7b), aligned with said first hole (56a), and **in that** the detachable retainer (54) has the shape of a cylindrical pin suitable for being inserted in both holes (56a, 56b).
4. A device according to claim 3, **characterized in that** the detachable retainer (54) includes a projecting portion defining a handle (54a) and a portion with outer threads which is coupled to a portion with inner threads of one of said holes (56a).
5. A device according to claim 2, 3 or 4, **characterized in that** the mentioned projections (22a, 22b) supporting one another, of the two pieces (7a, 7b), are traversed by mutually aligned holes (23a, 23b) through which locking screw and nut assemblies (27, 28) are installed for the purpose of joining the two pieces (7a, 7b) together.
6. A device according to claim 2, **characterized in that** a gap (29) is formed between said inner planar faces (16a, 16b) for the passage of said arm (13), and **in that** the cam follower (12) projects out from both sides of a free end of said arm (13) and moves inserted in said opposing symmetrical recesses (30a, 30b).
7. A device according to claim 6, **characterized in that** the body (7) includes a second converging-diverging double-funnel assembly (57) at an end opposite to the first double-funnel assembly (8), and **in that** at least one of the two pieces (7a, 7b) includes at least one stop (58a, 58b) projecting out from the corresponding inner planar face (16a, 16b) to interfere with the arm (13) for the purpose of limiting the path of the load bar (5) when the body (7) is at the end of the guides (6).



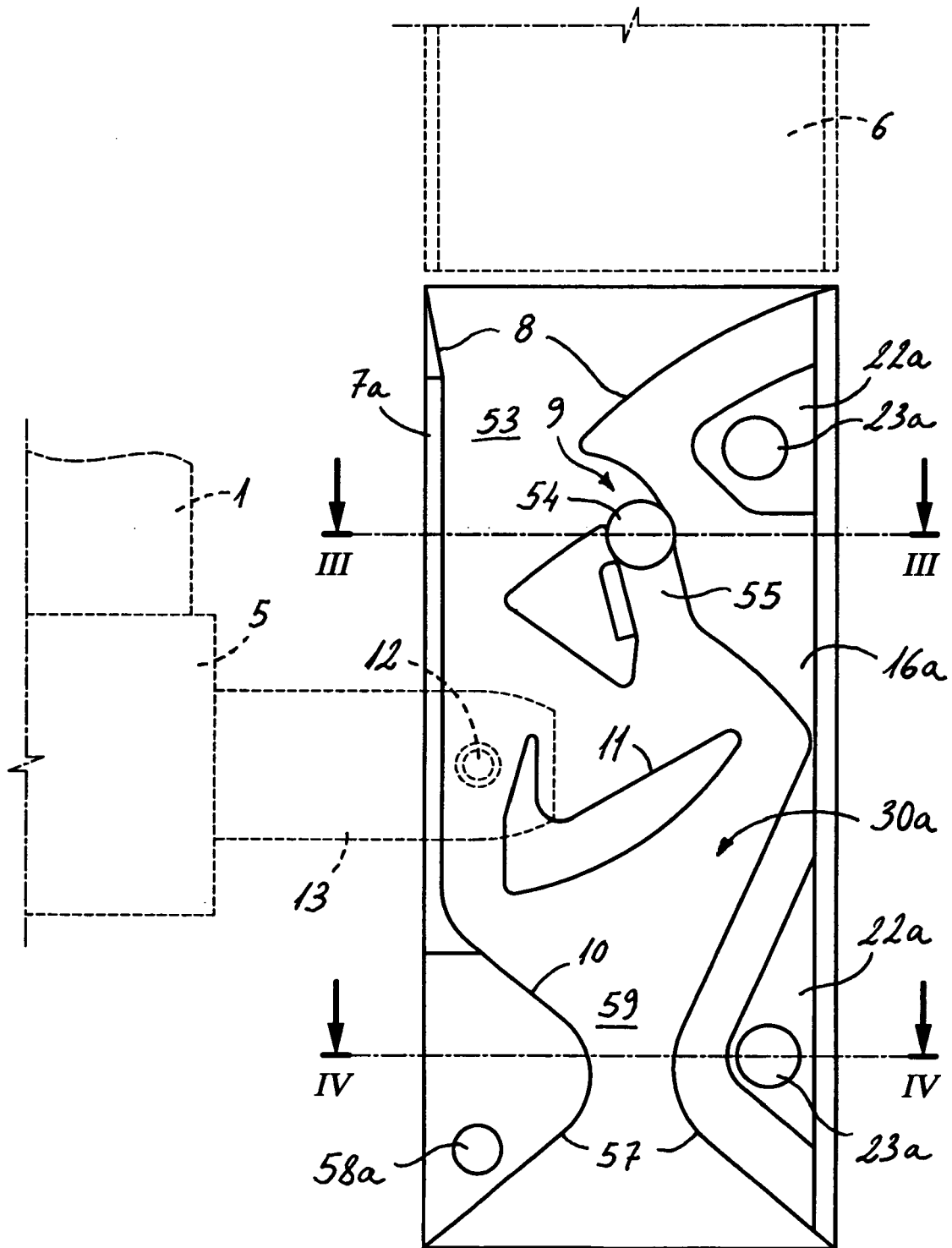


Fig.2

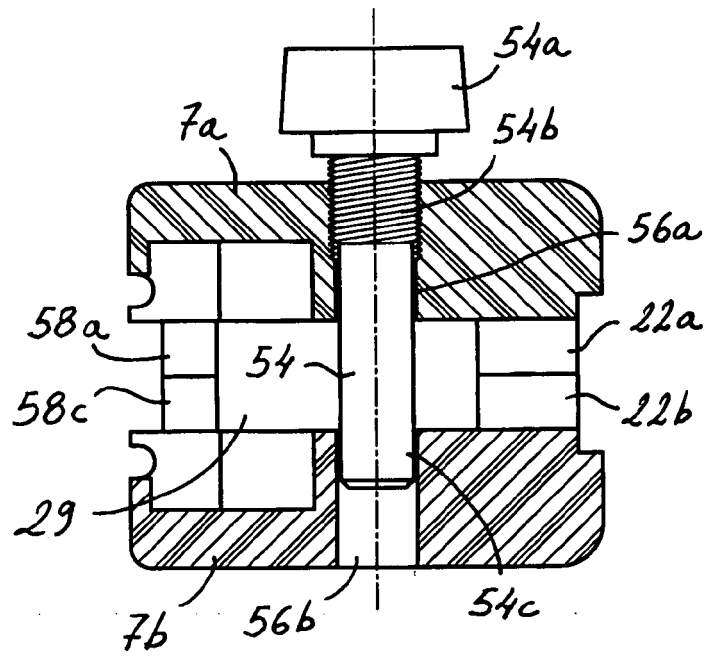


Fig. 3

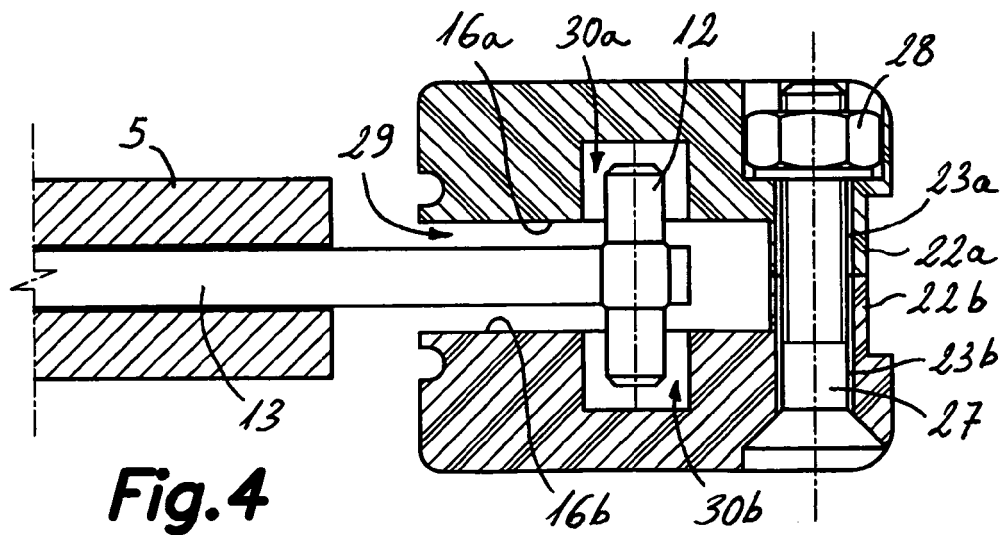


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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