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(54) Closure device for sliding leaves

(57) A closure device for a sliding leaf, comprising a cremone-bolt actuation system provided with at least one traction element (28) for actuating a respective rod (10) which is slidingly guided in a seat of the front edge of the leaf and is provided with at least one engagement element (11), the cremone-bolt actuation system being suitable to actuate the engagement of the engagement element (11) in a respective slot (18) of an abutment post (19) of the front edge, the device further comprising a block (29) which is connected to the rod (10) and having an engagement seat for the traction element (28) and a contrast element (40) which is actuated by elastic means (41) against the traction element (28) in order to elastically retain the traction element in the seat, the seat being shaped so as to allow movements of the block (29) with respect to the traction element (28) when the rod (10) is actuated in contrast with the elastic means (41).

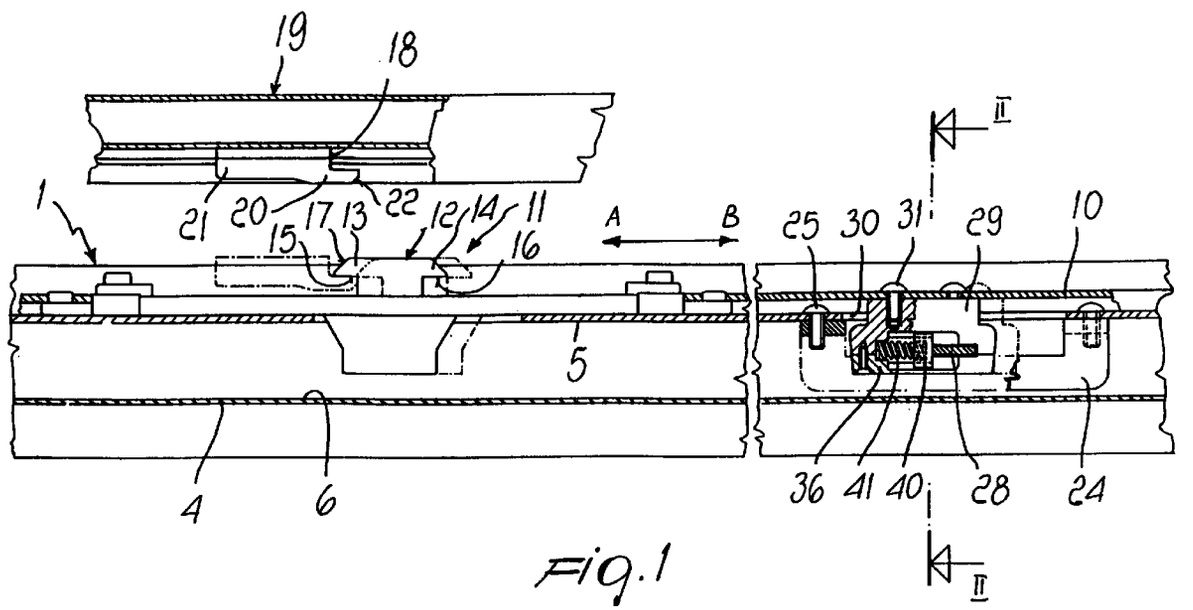

Fig.1

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Description

[0001] The present invention relates to a closure device for sliding leaves.

[0002] Conventional sliding leaves have closure devices which comprise engagement elements that protrude from the front abutment edge to engage respective slots of the front edge of a complementary leaf or the doorjamb. After engaging the openings, said elements, by means of a cremone-bolt mechanism, are made to slide so as to engage the slots and retain the leaf in the closed position.

[0003] In conventional devices, once the engagement elements have been actuated into the retention position by the cremone-bolt mechanism, they are locked axially. This fact causes severe drawbacks if the devices are actuated into the retention position when the leaf is not in the door closure position, i.e., is not in abutment against the complementary leaf or the doorjamb. In this case, the engagement elements are not aligned with the respective slots and therefore if the leaf is made to slide into the door closure position, the engagement elements strike the abutment post of the doorjamb or of the complementary leaf, causing the consequent deformation and damage of said elements and/or of the post.

[0004] The aim of the present invention is to provide a device whose structure is such that it obviates the above drawbacks, i.e., it is capable of engaging automatically also when the engagement elements are not aligned with the respective engagement slots.

[0005] Within the scope of this aim, an object of the present invention is to provide a device which is structurally simple and flexible in use so that it can be applied to the various sliding leaves that are currently commercially available.

[0006] This aim, this object and others which will become apparent hereinafter are achieved by a closure device for a sliding leaf, which comprises a cremone-bolt actuation system provided with at least one traction element for actuating a respective rod which is slidingly guided in a seat of the front edge of said leaf and is provided with at least one engagement element, said cremone-bolt actuation system being suitable to actuate the engagement of said element in a respective slot of an abutment post of said front edge, characterized in that it comprises a block which is connected to said rod and has an engagement seat for said traction element and a contrast element which is actuated by elastic means against said traction element in order to elastically retain said traction element in said seat, said seat being shaped so as to allow movements of said block with respect to said traction element when said rod is actuated in contrast with said elastic means.

[0007] Further characteristics and advantages of the device according to the present invention will become apparent from the following detailed description of some preferred but not exclusive embodiments thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a longitudinal sectional view of the front post of a leaf provided with a device according to the invention;

Figure 2 is a sectional view, taken along the plane II-II of Figure 1;

Figure 3 is an exploded perspective view of the device;

Figure 4 is a longitudinal sectional view of the front post of a leaf provided with a device according to a second embodiment of the invention;

Figure 5 is a sectional view, taken along the plane V-V of Figure 4.

[0008] With reference to Figures 1 to 3, the reference numeral 1 designates a profiled element that constitutes the front post of a conventional sliding leaf, the rest of which is not shown.

[0009] The profiled element 1 comprises two flat and mutually parallel walls 2 and 3 which are mutually connected by two transverse ribs 4 and 5 which form a longitudinal cavity 6.

[0010] The front edges of the post 1 converge and are internally provided with two mutually opposite ridges 7 and 8 which form a longitudinal seat 9 together with the rib 5.

[0011] A rod 10 having a flattened cross-section is slidingly guided in the seat 9, and engagement elements 11 are rigidly coupled to said rod; only one of said engagement elements is shown in Figure 1. Each element is constituted by a flat plate which is perpendicular to the plane of the rod and lies along the centerline of the post.

[0012] Each flat plate 11 comprises a T-shaped head 12 provided with two axial and mutually opposite teeth 13 and 14 which form respective undercuts 15 and 16. The tooth 13 has a chamfer 17 which forms, together with the undercut 15, an angle of approximately 45°.

[0013] The illustrated example assumes that the leaf engagement position is reached when the rod 10 is actuated in the direction A and that engagement is provided only by the tooth 13 and by the corresponding undercut 15. The tooth 14 and the corresponding undercut 16 are ineffective in the illustrated example and are used if engagement must occur by moving the rod in the direction B, which is the opposite of A.

[0014] The tooth 13 is meant to engage a slot 18 of the post 19 against which the leaf is pushed. The slot 18 is constituted by an undercut formed by a tooth 20 of a body 21 which is fixed frontally to the post 19. The tooth 20 also has a chamfer 22 which is suitable to cooperate, as will become apparent hereinafter, with the chamfer 17 of the tooth 13.

[0015] The movement of the rod 10 in the directions A-B and therefore the engagement between the post 1 and the post 19 is determined by an actuation system of the cremone-bolt type, which is associated on an outer

face of the profiled element 1 and is generally designated by the reference numeral 23.

[0016] Said actuation system 23 comprises a bracket 24 which is fixed to the rib 5 of the profiled element 11 by screws 25 and supports a box-like base 26 which accommodates an actuation mechanism which can be operated by means of an external lever 27 which, through adapted transmission means, moves in the direction A-B a traction flap or traction element 28 which protrudes into the longitudinal cavity 6. The details of the cremone-bolt actuation system are not shown in the drawing since they are not pertinent to the present invention and in any case have a conventional structure.

[0017] The traction element 28 transmits the movement to the rod 10 by means of a connecting element which comprises a prism-shaped block 29, which joins the traction element 28 to the rod 10 through a slot 30 of the rib 5 of the profiled element 1 which is elongated so as to allow the sliding of the block 29.

[0018] The prism-shaped block 29, see particularly Figure 3, is fixed by means of two screws 31 to the rod 10, and a seat 32 is formed therein; the provision of said seat forms two end protrusions 33 and 34 on which screws 35 fix a bridge 36 which closes the seat 32.

[0019] The seat 32 has two flat and mutually opposite faces 37 in which, along approximately half of their length, grooves 38 are provided which are parallel to each other and to the rod 10 and form a step 39.

[0020] The grooves 38 act as a guide for a contrast element which is constituted by a pusher 40 on which two springs 41 act; said springs are interposed between said pusher and the protrusion 33. The pusher 40 has, on two opposite edges, ridges whose cross-section is complementary to the cross-section of the grooves 38 and keep it guided during any mutual sliding movements of the step 39 on one side and of the protrusion 33 on the opposite side. The seat 32 is meant to be engaged, in the position in which the actuation system 23 is mounted on the profiled element 1, by the traction flap 28 which, by means of the springs 41, is kept against the protrusion 34 by the pusher 40.

[0021] The described device works as follows. By actuating the lever-operated actuation system 23, the rod 10 is made to slide in the longitudinal seat 9 so that, when the leaf abuts against the post 19, the tooth 13 can engage the slot 18. The leaf is thus locked shut by means of the engagement produced by the mutual coupling of the teeth 13 and 20.

[0022] By operating the actuation system 23 in the opposite direction, the tooth 13 disengages from the slot 18, allowing to open the leaf. Accordingly, in normal leaf closure and opening operations the device works in a fully conventional manner.

[0023] However, when the leaf is made to slide into the closed position starting from the open position, but with the element 11 in the engagement position, the chamfer 17 of the tooth 13 abuts against the corresponding chamfer 22 of the tooth 20. This impact generates a longitudinal thrust in the direction B on the element 11 which, through the rod 10, produces a movement of the block 29 with respect to the traction element 28 and compresses the springs 41.

[0024] When the chamfer 17, through the movement of the element 11, reaches the position for disengaging from the chamfer 22 of the tooth 20, if one continues to push against the leaf, the compressed springs 41 push the rod in the direction A again, allowing the tooth 13 to engage the slot 18.

[0025] It is evident that the described invention perfectly achieves the intended aim and object. In particular, it should be observed that the yielding of the rod 10 during closure, allowed by the springs 41, with respect to currently commercially available devices prevents the engagement teeth 13 and 20 from being subjected, by striking each other, to deformations which would compromise the perfect operation of the leaf to the point of preventing its closure and opening. Moreover, the yielding of the rod 10 with respect to the traction element 24, produced by the springs 41, ensures automatic closure of the leaf, i.e., closure without having to operate the cremone-bolt actuation system.

[0026] The described device is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept.

[0027] Figures 4 and 5 illustrate a different embodiment in which the components that are identical or correspond functionally to those of the embodiment of Figures 1-3 are designated by the same reference numerals. In this embodiment, the block 29 is provided with lateral fins 42 by means of which it is guided in a slot 43 of the profiled element 1, and the rod 10 is composed of a pair of strips 44 and 45 rigidly coupled to a pair of pivots 46 and 47 which protrude from the block 29.

[0028] The disclosures in Italian Patent Application No. BO97A000484 from which this application claims priority are incorporated herein by reference.

[0029] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A closure device for a sliding leaf, comprising a cremone-bolt actuation system (23) provided with at least one traction element (28) for actuating a respective rod (10) which is slidingly guided in a seat (9) of the front edge of said leaf and is provided with at least one engagement element (11), said cremone-bolt actuation system (23) being suitable to actuate the engagement of said element (11) in a respective slot (18) of an abutment post (19) of said

front edge, characterized in that it comprises a block (29) which is connected to said rod (10) and has an engagement seat (32) for said traction element (28) and a contrast element (40) which is actuated by elastic means (41) against said traction element (28) in order to elastically retain said traction element in said seat (32), said seat (32) being shaped so as to allow movements of said block (29) with respect to said traction element (28) when said rod (10) is actuated in contrast with said elastic means (41).

2. A device according to claim 1, characterized in that said block (29) has a seat (32) with two flat and mutually parallel opposite faces in which, along part of their length, slots (38) are provided which act as a guide for a pusher (40) on which spring means (41) accommodated in said block (29) act in order to keep said traction element (28) locked in said seat (32).

3. A device according to claim 2, characterized in that said block (29) has guiding fins (42) in a profiled element of said leaf and engagement pivots (46, 47) for said rod.

4. A device according to claim 3, characterized in that said profiled element is provided with a slot (43) in which said fins slide, said rod (10) being composed of a pair of strips (44,45) rigidly coupled to said engagement pivots (46,47).

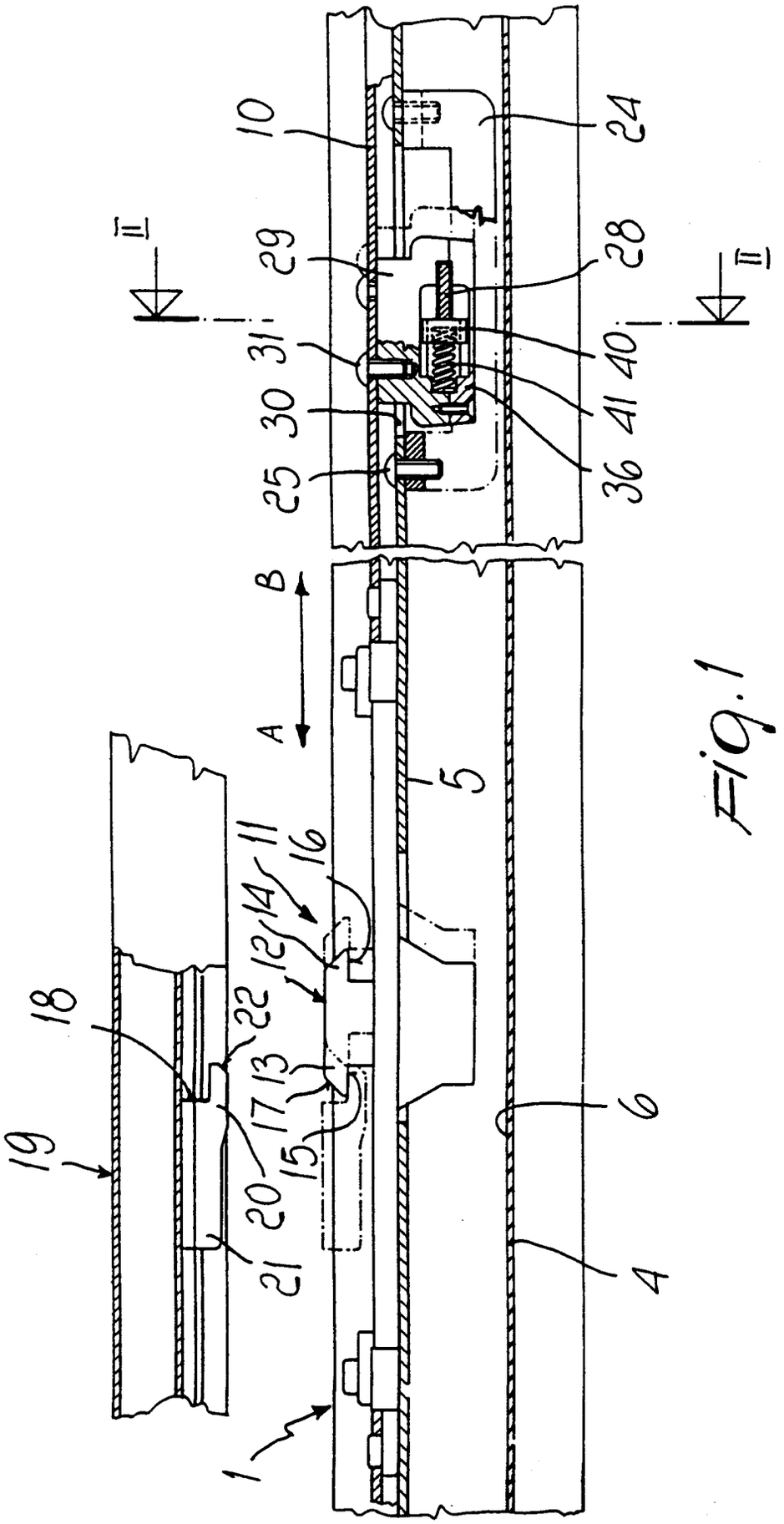
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Fig. 1

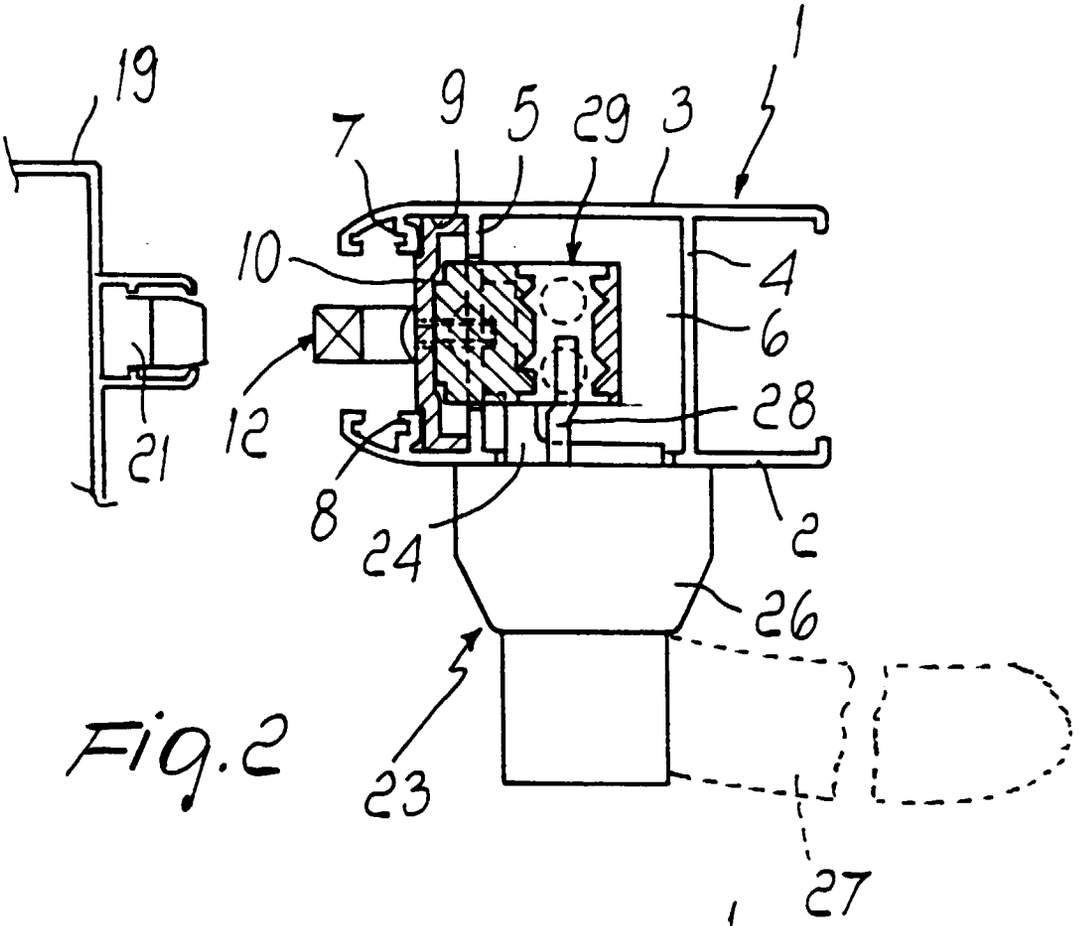

Fig. 2

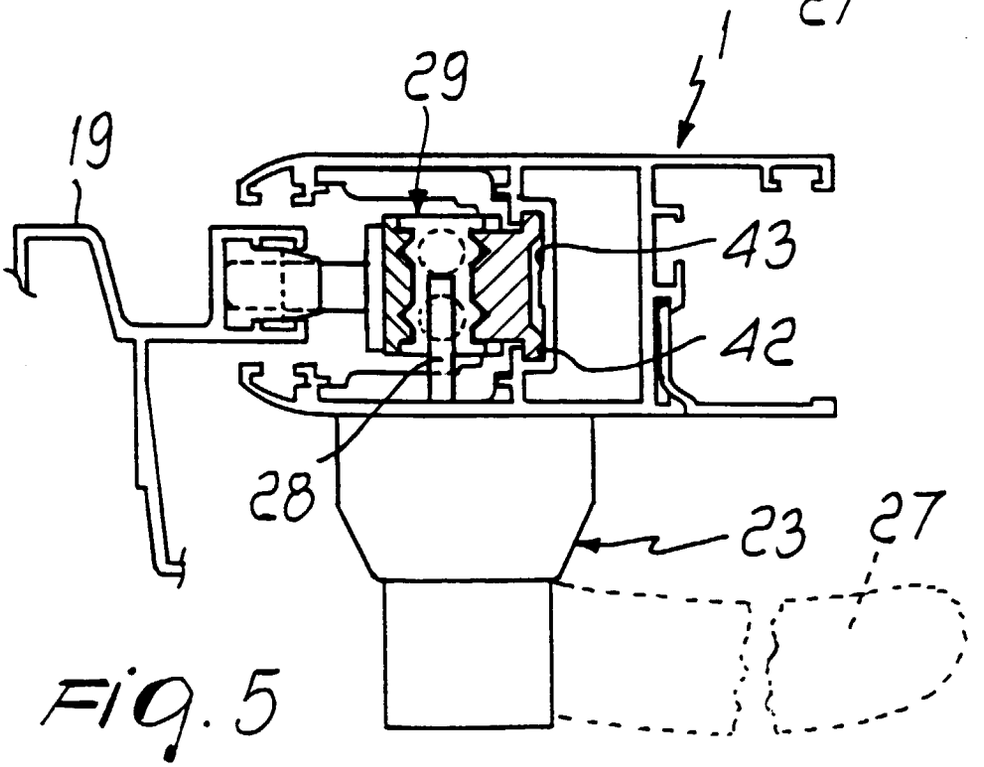

Fig. 5

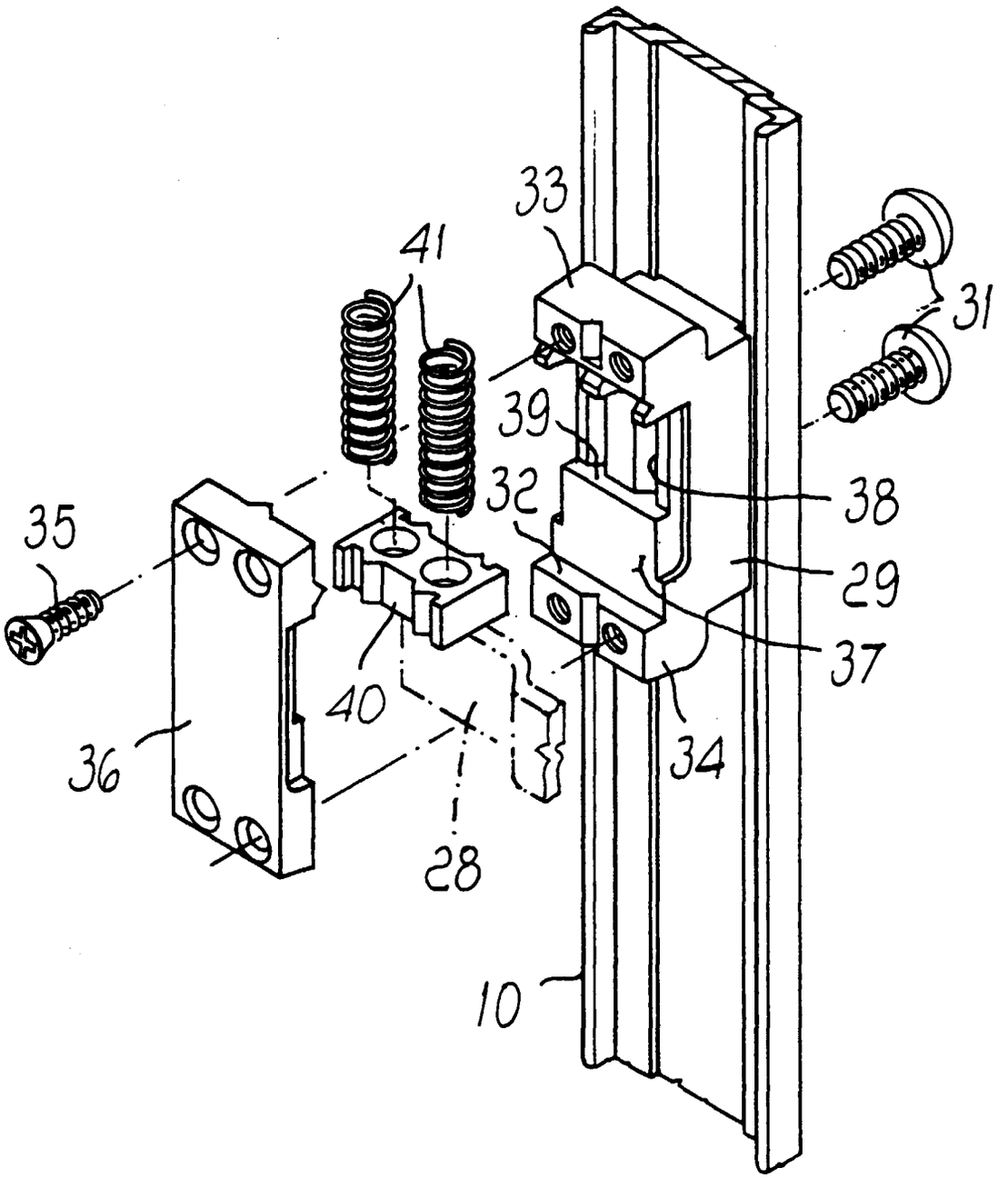

Fig. 3

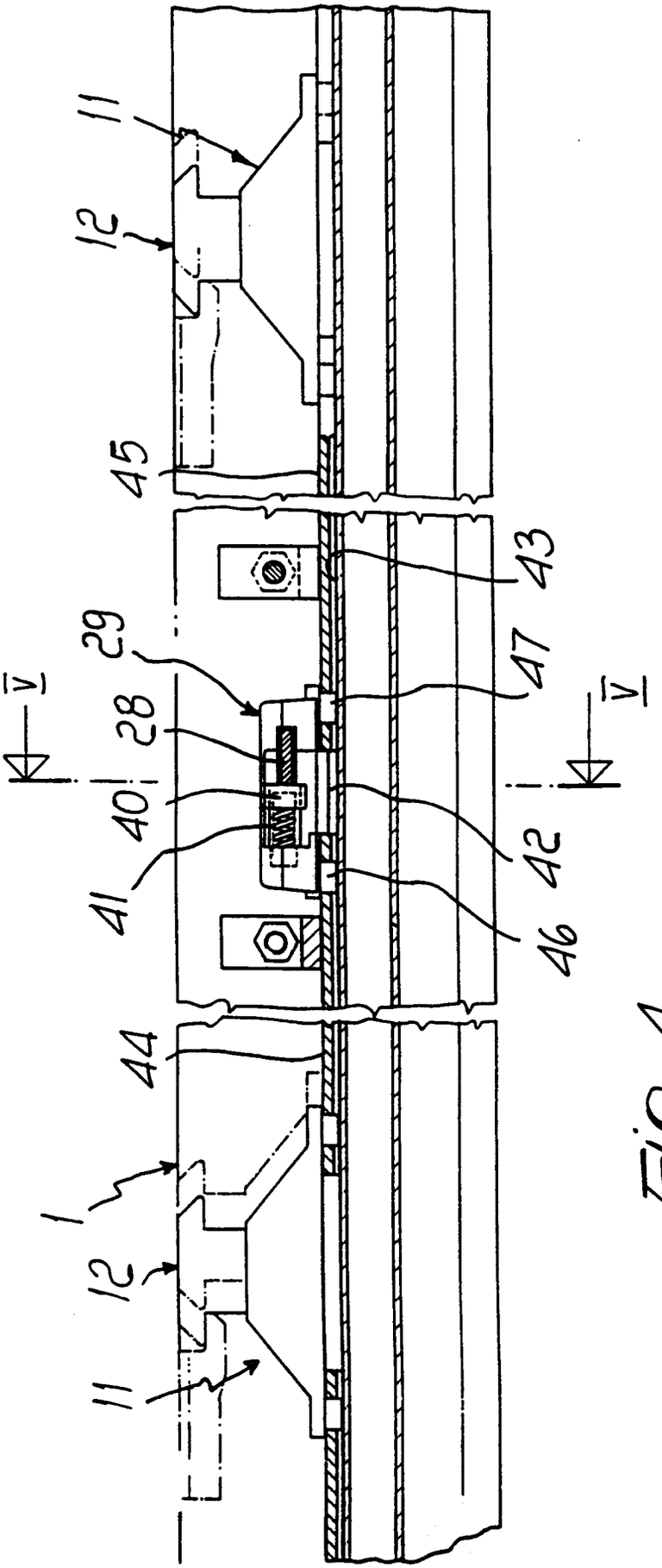

Fig. 4