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(54) OPERATING DEVICE FOR DOORS AND WINDOWS

(57) Described is an operating device for doors and windows (1) comprising a segment (4) of rod slidably coupled, in use, in a perimeter channel (5) of a mobile frame (3) and having an axis (X) of longitudinal extension; a slot (6) made in the segment (4) of rod with an extension parallel to the axis (X) of longitudinal extension of the segment (4) of rod; a contact plug (7) positioned along a first inner surface of the segment (4) of rod partly covering the slot (6); a pin (8) located on a second outer surface of the segment (4) of rod partly covering the slot (6); removable connecting means (9) for connecting together the pin (8) and the contact plug (7) and configured to allow, in use and when required, a sliding of the pin (8) along the slot (6); stabilising means (10) for stabilising the position of the pin (8) along the slot (6) and made between the first surface of the segment (4) of rod and a surface of the contact plug (7) facing the first surface of the segment (4) of rod and configured to allow a stable positioning of the pin (8) following a locking between the pin (8) and the contact plug (7) obtained with the connecting means (9). [FIG. 1]

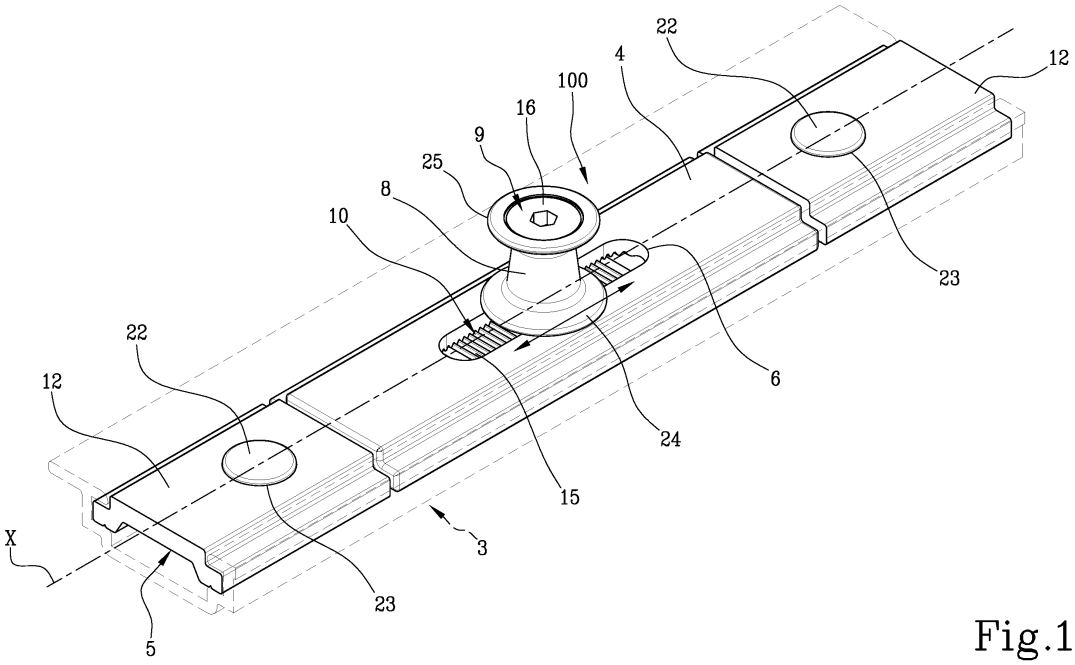

Fig.1

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Description

[0001] This invention relates to an operating device for doors and windows.

[0002] In particular, the doors or windows according to the invention may be doors or windows comprising a fixed frame and a mobile frame with a turning opening or a turning and tilting opening.

[0003] At least the mobile frame has a profile provided with a perimeter channel. Currently, the operating devices used for this type of door or window comprise:

- a control handle associated with the mobile frame;
- a plurality of rods positioned and slidable inside the channel of the mobile frame and connected to the control handle;
- a plurality of bosses or pins fixed on the rods (protruding from the rods themselves) at predetermined points of the fixed frame and configured to intercept, under the action of the handle, contact elements associated with the fixed frame for determining the closed or open position of the door or window.

[0004] In other words, the user acts on the handle to cause a movement of the rods, that is to say, a sliding of the rods in one direction or the other, in such a way as to move the pins towards or away from the contact elements and to determine a closed or open configuration (turned or tilted) of the mobile frame.

[0005] As an alternative to the handle, an electric actuator may be used as control element for particular requirements and for tilted openings.

[0006] In this case, the actuator body is associated with an upper crosspiece of the fixed frame and may be connected, by means of a movable kinematic unit, to a pin associated with a rod present in the proximity of the actuator body in such a way as to allow a sliding movement, in both directions, of the rod in order to obtain at least the tilted opening (and closing) of the mobile frame.

[0007] This type of solution is known from patent documents EP 3 235 981, GB 2 313 618, AT 318 428 and US 10 808 424.

[0008] These operating systems (manual or motor-driven) have some drawbacks, in particular during the steps for making and applying the components. The door or window installer, depending on the dimensions of the door or window, must make the segments of rods according to the suitable dimensions and apply the pins on them in precise points.

[0009] In the same way, the door or window installer must associate the corresponding contact elements in a fixed position on the fixed frame in such a way that their position coincides with the hypothetical position of the pin in the closed position.

[0010] This type of assembly (in particular for anti-burglary contact elements) must be very precise in order to guarantee a correct actuation of the open and closed positions by means of the coupling and uncoupling between pin and contact element.

[0011] However, in the current doors and windows there is a large number of pins and contact elements which, together, form the operating system and it may happen that the arrangement of these elements is not completely correct and goes beyond the permissible tolerances. In particular, when their position is not completely easy to reach for assembly.

[0012] In this situation, therefore, it is necessary to carry out dismantling operations on the fixed or mobile frame of the components which are not correctly positioned to attempt to adapt them by means of modifications to their position until reaching a reasonable compromise.

[0013] However, these measures result in an increase in the assembly time, a possible reduction in the integrity of the fixed frames on which further operations must be performed, or the replacement of segments of rod with pins not correctly positioned with an increase in the costs of the door or window.

[0014] These considerations also apply with the presence, if any, of the actuator, which is mounted on the fixed frame (normally on the upper crosspiece of the fixed frame) in a predetermined position and has the kinematic unit positioned parallel to the crosspiece of the mobile frame.

[0015] At a predetermined distance from the kinematic unit there must be a pin associated on the rod.

[0016] This pin must be reached by the kinematic unit of the actuator configured for coupling with the pin and allowing the pushing or pulling of the pin and, therefore, of the remaining operating unit to allow the reaching of the open and closed positions.

[0017] In this case, too, an imprecise positioning of the pin may result in an incorrect coupling with the actuator, thereby making a new positioning necessary of the actuator or a replacement of the pin with relative segment of rod.

[0018] The aim of the invention is to provide an operating device for doors and windows which overcomes the above-mentioned drawbacks of the prior art.

[0019] In particular, the aim of the invention is to provide an operating device for doors and windows which is able to allow a greater elasticity of assembly of the operating unit keeping unchanged the operating reliability of the operating unit.

[0020] A further aim of this invention is to provide an operating device for doors and windows which is able to achieve a faster and more rapid assembly of the entire operating unit of the door or window without modifying the structure.

[0021] Said aims are fully achieved by an operating device for doors and windows according to the invention as characterised in the appended claims.

[0022] The main features of the invention will become more apparent from the following detailed description of a preferred, non-limiting embodiment, illustrated purely by way of example in the accompanying drawings, in which:

- Figure 1 shows a perspective view of an operating device for doors and windows according to this invention housed in a channel and connected to operating rods;
- Figure 2 shows a front exploded perspective view of the operating device of Figure 1;
- Figures 3 and 4 show rear assembled and exploded perspective views of the operating device of Figure 1;
- Figure 5 shows a door or window in which the operating device of the preceding drawings is applied in a perspective view, with some parts cut away in order to better illustrate others;
- Figures 6 and 7 show perspective views of a detail of the door or window of Figure 5 in which an electric actuator is in an inactive position and, respectively, in an operating position;
- Figures 8 and 9 show corresponding details of the door or window of Figure 5 with further examples of use of the operating device according to the invention; the drawings are both perspective views, with some parts cut away to better illustrate others.

[0023] With reference to the accompanying drawings, and with particular reference to Figures 1 and 5, the operating device according to this invention, labelled 100 in its entirety, is applicable on doors and windows 1 having a fixed frame 2 and a mobile frame 3.

[0024] As illustrated, see also Figures 2 to 4, the operating device 100 comprises a segment 4 of rod which can be slidably coupled, in use, in a perimeter channel 5 of the mobile frame 3. The segment 4 of rod has a longitudinal axis X of extension.

[0025] Again as illustrated, the operating device 100 comprises a slot 6 made on the segment 4 of rod with an extension parallel to the axis X of longitudinal extension of the segment 4 of rod.

[0026] Moreover, the operating device 100 comprises a contact plug 7 (quadrangular in shape) positioned along a first inner surface of the segment 4 of rod partly covering the slot 6.

[0027] The operating device 100 comprises a pin 8 positioned on a second outer surface of the segment 4 of rod partly covering the slot 6.

[0028] As illustrated, the operating device 100 comprises removable connecting means 9 for connecting together the pin 8 and the contact plug 7 and configured to allow, in use and when required, a free sliding of the pin 8 along the slot 6.

[0029] Moreover, the operating device 100 comprises stabilising means 10 for stabilising the position of the pin 8 along the slot 6 and made between the first surface of the segment 4 of rod and a surface of the contact plug 7 facing the first surface of the segment 4 of rod and configured to allow a stable positioning of the pin 8 following a locking between the pin 8 and the contact plug 7 obtained with the connecting means 9.

[0030] In other words, as described in more detail below, the operating device allows it to be positioned at any point of the perimeter of the mobile frame and connected to the remaining operating unit with the possibility of actuating a longitudinal adjustment of the operating pin as a function of the position of contact elements present on the door or window so as to obtain the correct coupling/uncoupling in use.

[0031] All this operates also with the device mounted and without having to make modifications to other components present on the door or window.

[0032] As illustrated, the operating device 100 comprises connecting means 11 configured for connecting the segment 4 of rod, in use, to respective operating rods 12 present on the mobile frame 3.

[0033] In light of this, the connecting means 11 are positioned at the two ends of the segment 4 of rod.

[0034] Thanks to these connecting means 11, the segment 4 of rod can be associated at any point of the mobile frame 3 depending on requirements. In light of this, the connecting means 11 comprise an elongate extension 20, 21 for each end of the segment 4 of rod protruding from the first surface of the segment 4 of rod.

[0035] At the end of each extension 20, 21 there is a button 22 (protruding) which can be coupled, in use, in a seat 23 made on a rod 12 before or after the segment 4 of rod (see Figure 1).

[0036] It should be noted that the above-mentioned stabilising means 10 comprise the first surface of the segment 4 of rod having a first plurality of protrusions or notches 14 (defining a "striped" surface) made at least around the slot 6.

[0037] The above-mentioned stabilising means 10 also comprise the surface of the contact plug 7 facing the first surface of the segment 4 of rod having a second plurality of protrusions or notches 15 configured to be coupled with the first plurality of protrusions or notches 14 in such a way as to allow the stabilisation of the position of the pin 8 along the slot 6 at the locking with the connecting means 9.

[0038] Thanks to these tooth shaped surfaces, once the position of the pin has been decided, it is possible to lock the pin by means of the locking means with consequent coupling between the teeth which ensure that the pin remains in the assigned position without the possibility of sliding.

[0039] Again as illustrated, the connecting means 9 comprise a screw element 16 which can be housed in a through hole 17 made on the pin 8 and screwable into a threaded bushing 18 made and protruding on the contact plug 7 to allow, when required, the locking of the pin 8 in the predetermined position along the slot 6.

[0040] In light of this, the bushing 18 of the contact plug 7 has a base 19 protruding from the surface of the contact plug 7 and configured to be coupled inside the slot 6 (during the locking step with the screw element 16) in such a way as to define an anti-rotation element at the locking of the pin 8.

[0041] As illustrated, the pin 8 has a cylindrical or

truncated cone shape with a hollow cross section having at a first end, a first annular flange 24 configured for contact with the second surface of the segment 4 of rod and a second annular flange 25, made on the second end of the pin 8, surrounding the hole 17 of the pin 8.

[0042] Thanks to the two flanges the pin is stably rested on the segment of rod (first flange), whilst the second flange allows a complete housing of the head of the screw element, reducing the dimensions in height of the pin. Obviously, this is one of the geometrical solutions of the pin, which can be, however, free of the flanges if unnecessary.

[0043] This invention (see Figure 5) provides a door or window 1 comprising a fixed frame 2 and a mobile frame 3 having operating means 12 (for example, rods) positioned along its perimeter and connected to at least one control element 13 (for example a handle) configured for moving the operating means 12, in both directions, to obtain an opening or closing of the mobile frame 3 relative to the fixed frame 2. This door or window 1 has operating means 12 comprising at least one operating device 100 as described above.

[0044] Figures 8 and 9 show two examples of using the operating device 100.

[0045] In Figure 8 the device 100 is used in combination with a striker and closing element 28 (associated with the fixed frame 2) of the door or window 1.

[0046] In this case, the pin 8 is cylindrical in shape and does not have the second flange 25.

[0047] In Figure 9 the device is used in combination with an anti-burglary striker element 29 (associated with the fixed frame 2) of the door or window 1.

[0048] In this solution, the second upper flange 25 is also used as a further locking element in synergy with the inner profile of the anti-burglary contact element 29.

[0049] It should be noted that the door or window 1 may have a control unit comprising an electric actuator 26 fixed to the fixed frame 2 (in particular along an upper crosspiece - see also Figures 6 and 7) equipped with a kinematic unit 27 having gripper-like operating ends configured to move towards, in an open configuration (not illustrated), and intercept the pin 8 of the operating device 100, in a closed configuration, in such a way as to allow a pulling (as illustrated in Figure 7, see arrow) or a pushing of the segment 4 of rod, connected to the remaining operating means 12, to obtain an opening or a closing of the mobile frame 3 (in particular a tilted opening).

[0050] Therefore, in this operating situation, the presence of the operating device with an adjustable pin makes it possible to adapt the distance of the pin relative to the stroke which can be performed by the kinematic unit if the electric actuator mounted on the fixed frame has not been correctly positioned relative to the initial position of the pin.

Claims

1. An operating device for doors and windows (1) having a fixed frame (2) and a mobile frame (3), **characterised in that** it comprises:

   - a segment (4) of rod which can be slidably coupled, in use, in a perimeter channel (5) of the mobile frame (3) and having a longitudinal axis (X) of extension;
   - a slot (6) made in the segment (4) of rod with an extension parallel to the axis (X) of longitudinal extension of the segment (4) of rod;
   - a contact plug (7) positioned along a first inner surface of the segment (4) of rod partly covering the slot (6);
   - a pin (8) located on a second outer surface of the segment (4) of rod partly covering the slot (6);
   - removable connecting means (9) for connecting together the pin (8) and the contact plug (7) and configured to allow, in use and when required, a sliding of the pin (8) along the slot (6);
   - stabilising means (10) for stabilising the position of the pin (8) along the slot (6) and made between the first surface of the segment (4) of rod and a surface of the contact plug (7) facing the first surface of the segment (4) of rod and configured to allow a stable positioning of the pin (8) following a locking between the pin (8) and the contact plug (7) obtained with the connecting means (9).

2. The device according to claim 1, comprising connecting means (11) configured for connecting the segment (4) of rod, in use, to respective operating rods (12) present on the mobile frame (3); said connecting means (11) being positioned at the two ends of the segment (4) of rod.

3. The device according to claim 1 or 2, wherein the stabilising means (10) comprise:

   - the first surface of the segment (4) of rod having a first plurality of protrusions or notches (14) made at least around the slot (6); and
   - the surface of the contact plug (7) facing the first surface of the segment (4) of rod having a second plurality of protrusions or notches (15) configured to be coupled with the first plurality of protrusions or notches (14) in such a way as to allow the stabilisation of the position of the pin (8) along the slot (6) at the locking with the connecting means (9).

4. The device according to any one of the preceding claims, wherein the connecting means (9) comprise a screw element (16) which can be housed in a

through hole (17) made on the pin (8) and screwable in a threaded bushing (18) made and protruding on the contact plug (7) to allow, when required, the locking of the pin (8) in the predetermined position along the slot (6).

5. The device according to claim 4, wherein the bushing (18) of the contact plug (7) has a base (19) protruding from the surface of the contact plug (7) configured to be coupled inside the slot (6) in such a way as to define an anti-rotation element at the locking of the pin (8).

6. The device according to any one of claims 2 to 5, wherein the connecting means (11) comprise an elongate extension (20, 21) for each end of the segment (4) of rod protruding from the first surface of the segment (4) of rod; at the end of each extension (20, 21) there being a button (22) which can be coupled, in use, in a seat (23) made on a rod (12) before or after the segment (4) of rod.

7. The device according to any one of claims 4 to 6, wherein the pin (8) has a cylindrical or truncated cone shape with a hollow cross section having at a first end a first annular flange (24) configured for contact with the second surface of the segment (4) of rod and a second annular flange (25), made on the second end of the pin (8), surrounding the hole (17) of the pin (8).

8. A door or window comprising a fixed frame (2) and a mobile frame (3) having operating means (12) positioned along its perimeter and connected to at least one control element (13) configured for moving the operating means (12), in both directions, to obtain an opening or a closing of the mobile frame (3) relative to the fixed frame (2), **characterised in that** the operating means (12) comprise at least one operating device (100) according to any one of claims 1 to 7.

9. The door or window according to claim 8, wherein a control unit comprises an electric actuator (26) fixed to the fixed frame (2) and equipped with a kinematic unit (27) having gripper-like operating ends configured to move towards, in an open configuration, and intercept the pin (8) of the operating device (100), in a closed configuration, in such a way as to allow a pulling or a pushing of the segment (4) of rod, connected to the remaining operating means (12), to obtain an opening or a closing of the mobile frame (3).

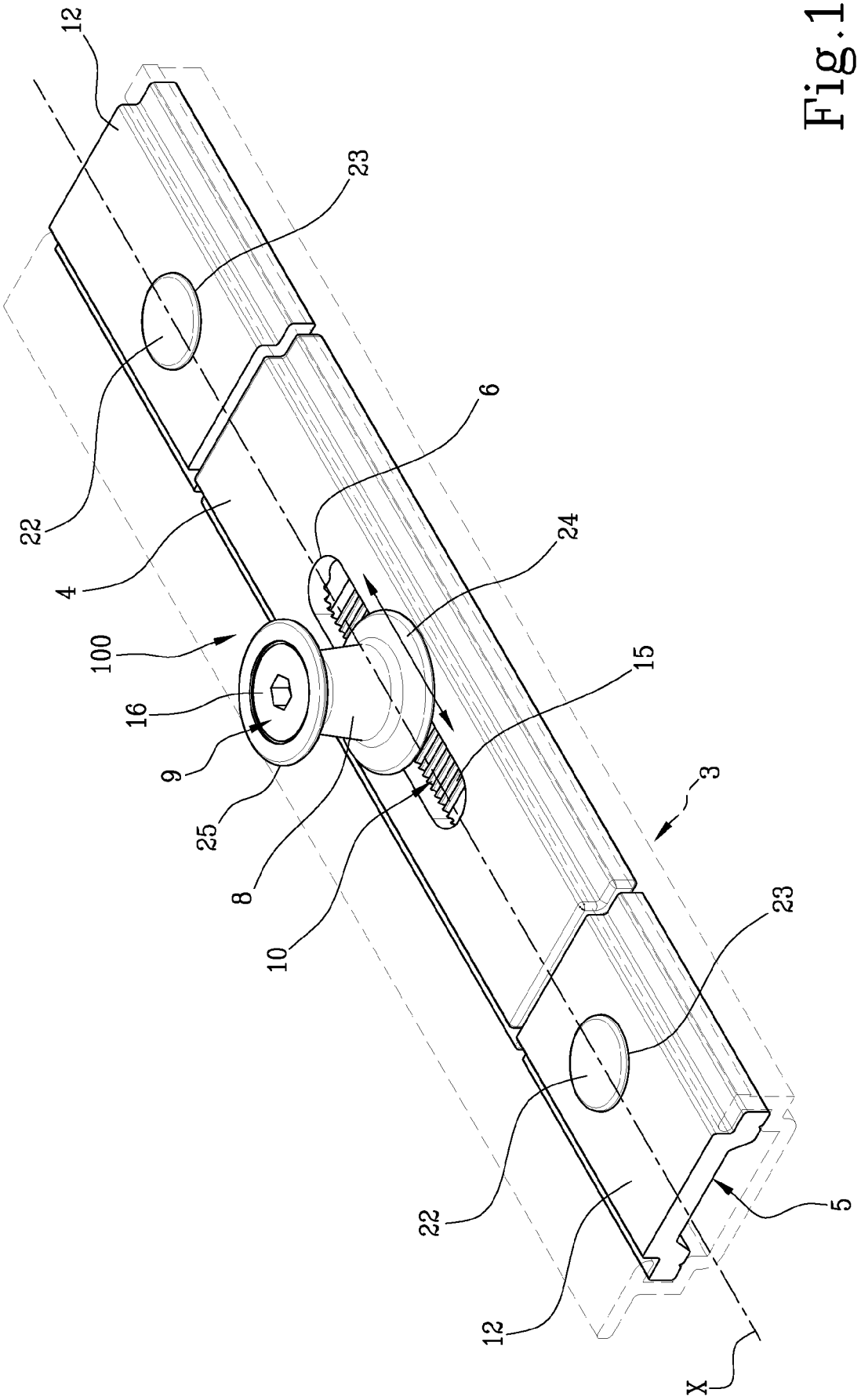
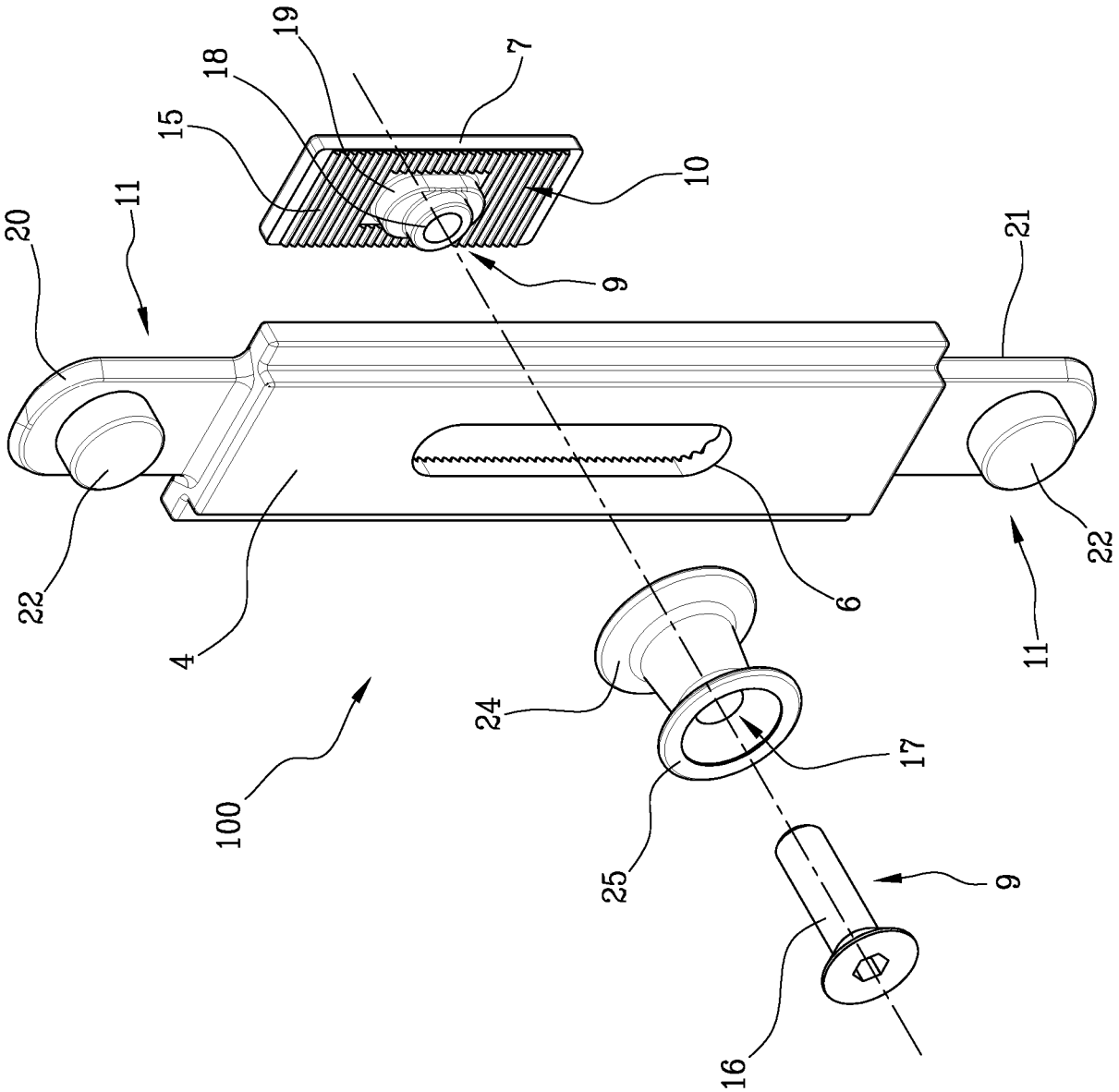


Fig.1

Fig.2



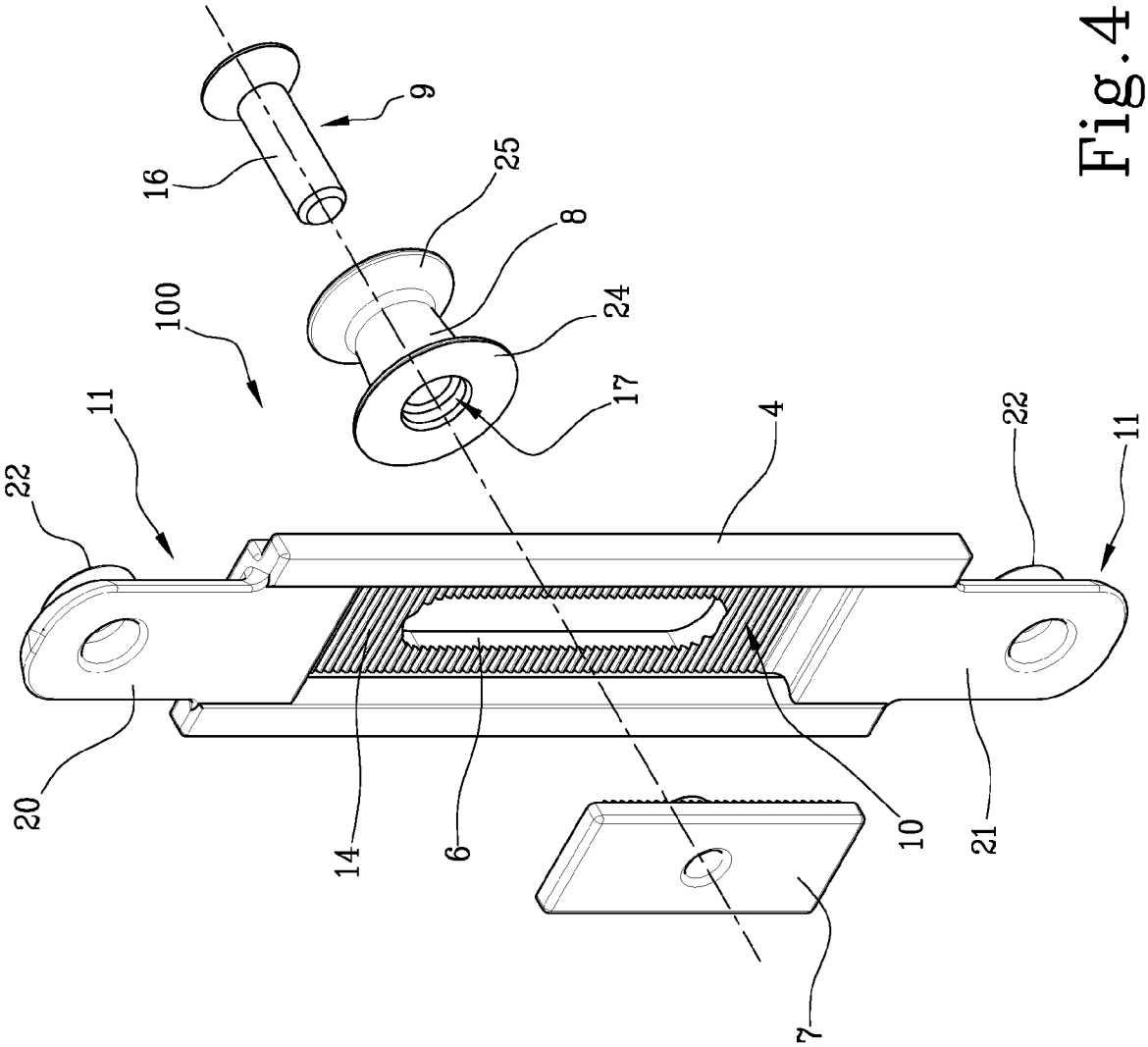

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Fig.4

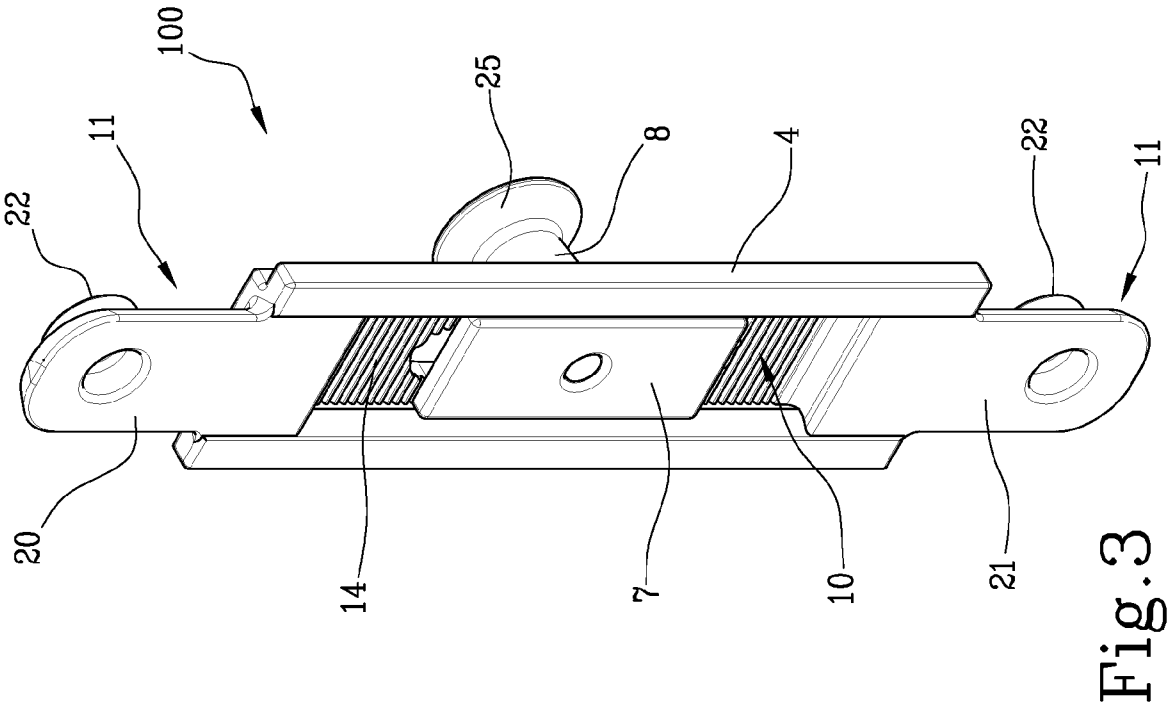
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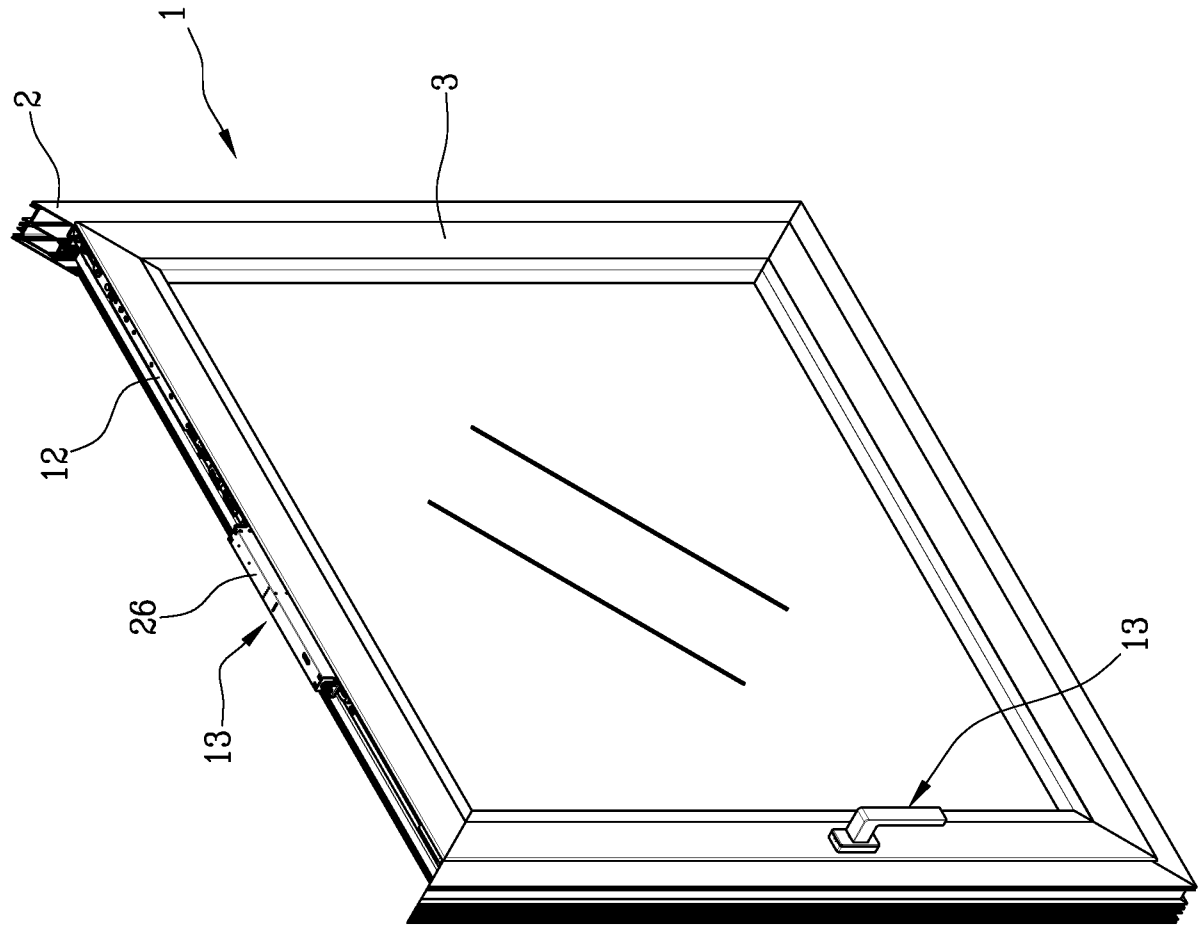
Fig.3

Fig.5



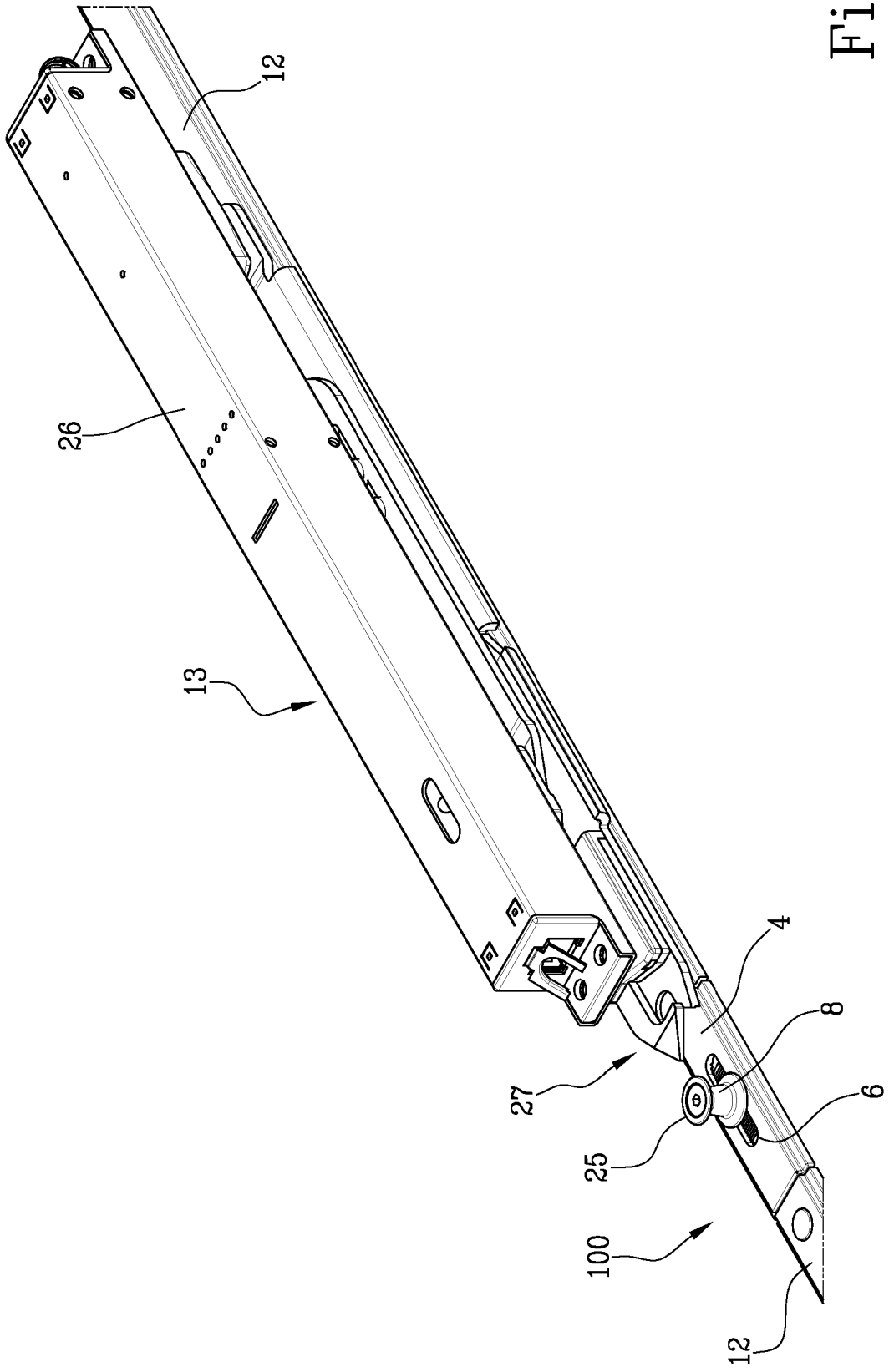


Fig.6

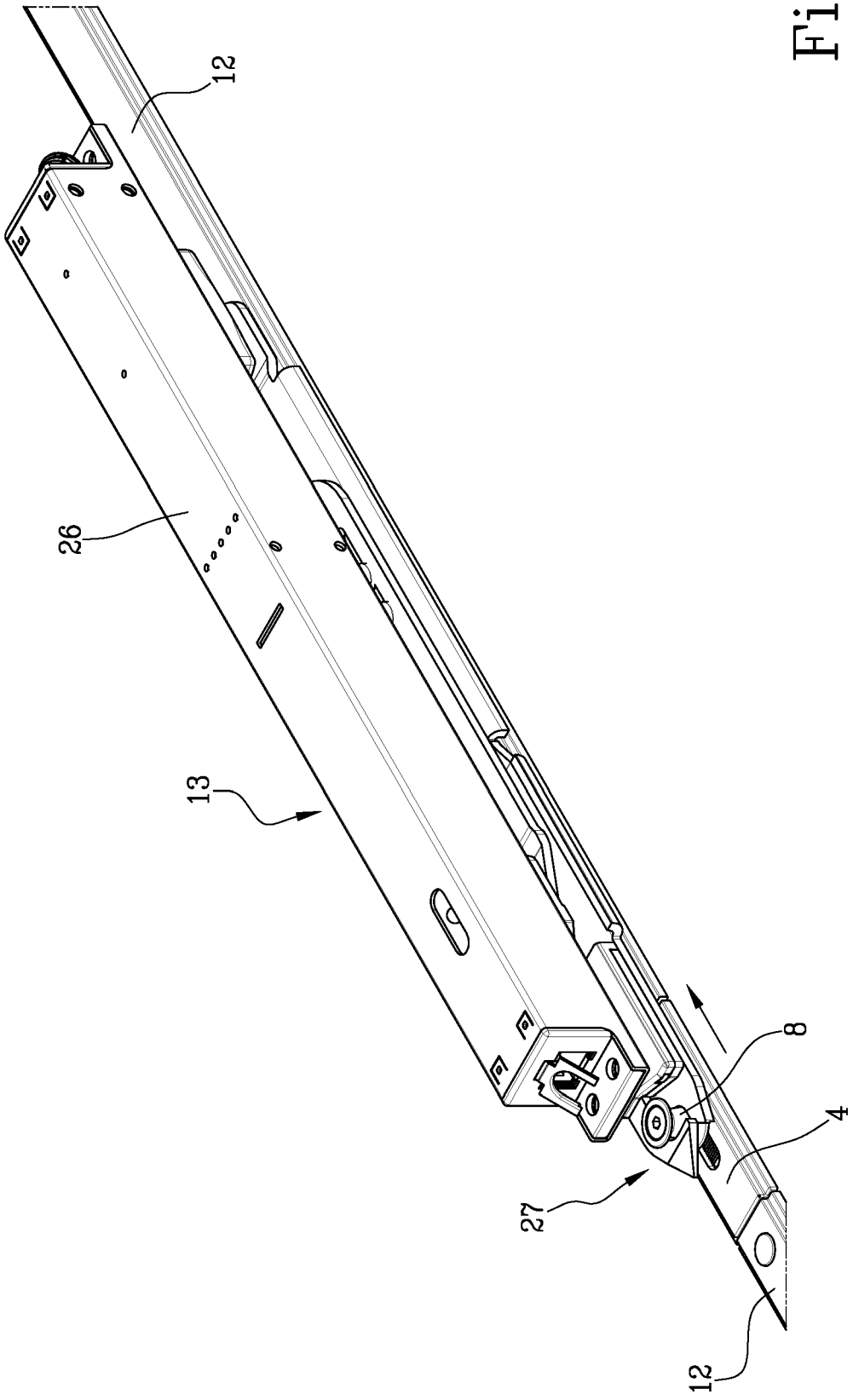
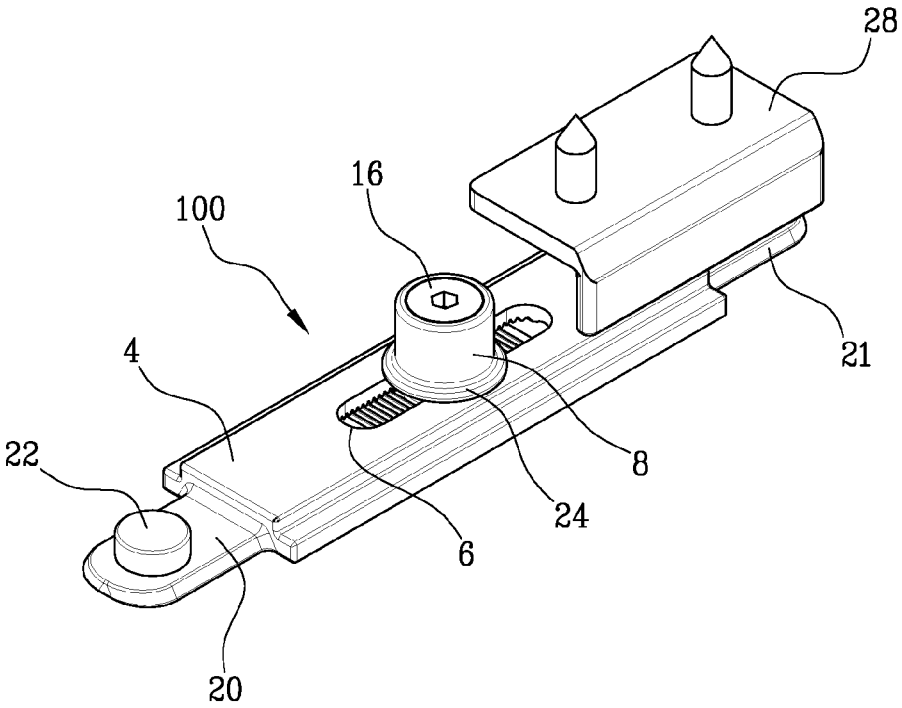


Fig.7

Fig.8



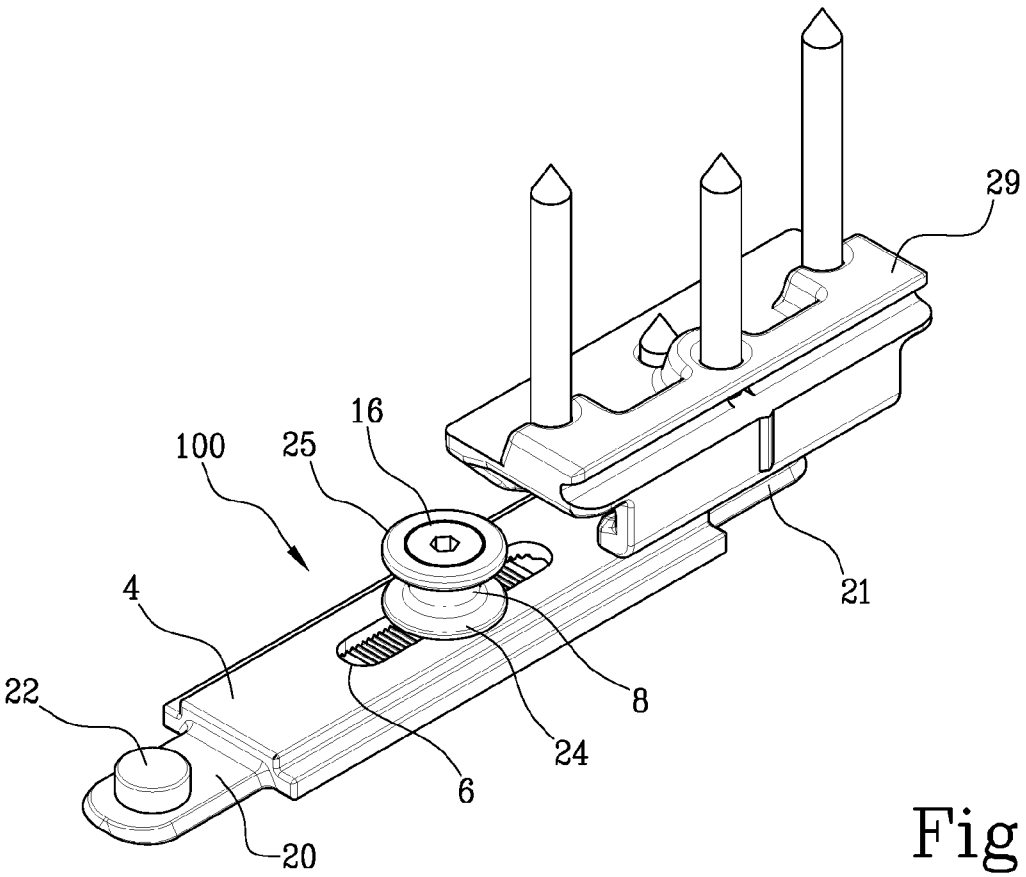


Fig.9

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EUROPEAN SEARCH REPORT

Application Number
EP 24 21 8660

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

E05C
E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 April 2025	Koster, Michael

CATEGORY OF CITED DOCUMENTS

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11-04-2025

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- AT 318428 **[0007]**
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