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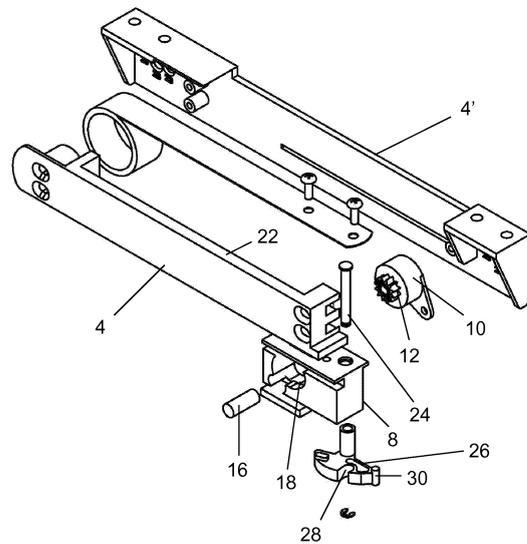
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(54) **Damper for wardrobe doors**

(57) A braked closure device for wardrobe doors, characterised by comprising:

- a body (2) to be fixed to the door (42) of the wardrobe (44), said door being provided with means (46) for its sliding along rails (48) rigid with the wardrobe,
  - a slider (8) slidable within said body (2) and secured to the end of an elastic means (38) having its other end rigid with the body,
  - a braking device (10) rigid with the slider and provided with a pinion (12) cooperating with a rack (20) rigid with the body, said pinion interfering resistively with the rack during door closure and passively during door opening,
  - means (50) rigid with the wardrobe and interfering with said slider (8) during door opening such as to lock the slider relative to the wardrobe and enable the body (2) to move relative to said slider, to hence load the elastic means (38),
  - means (26, 30, 32) for maintaining a stable position of the slider (8), urged by the elastic means (38), relative to the body, and to disengage the locking means (50) to enable the body to travel freely during subsequent opening of the door,
- said maintenance and disengagement means (26, 30, 32) interfering with said locking means (50) during subsequent door closure, to enable the body (2) to slide relative to the slider (8), pulled by the elastic reaction of said elastic means (38), said sliding being braked by interference of the pinion (12) with the rack (20).

FIG. 1



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## Description

**[0001]** The present invention relates to a braked closure device for wardrobe doors.

**[0002]** Wardrobes are known provided with doors which slide on trolleys rigid with the top and bottom of the door and guided along tracks provided on the base and on the wardrobe top-panel.

**[0003]** However these wardrobes suffer from the drawback that if closed with a certain force, the door can jolt at the end of travel and transfer its movement to the entire wardrobe.

**[0004]** An object of the invention is to eliminate this drawback by providing a device which enables wardrobe doors to be closed independently with simultaneous braking.

**[0005]** This and further objects which will be apparent from the ensuing description are attained according to the invention by a braked closure device for wardrobe doors as described in claim 1.

**[0006]** A preferred embodiment of the present invention is described hereinafter with reference to the accompanying drawings, in which:

Figure 1 is a front exploded perspective view of the device of the invention,  
 Figure 2 is a rear exploded perspective view thereof,  
 Figure 3 is a front perspective view thereof,  
 Figure 4 shows it in the same view as Figure 3 but with the coupling mechanism engaged,  
 Figure 5 is an exploded view of the closure device,  
 Figure 6 is a side view of the closure device,  
 Figure 7 is a plan view thereof,  
 Figures 8, 9, 10 show the movement of the door with the closure device according to the invention.

**[0007]** As can be seen from the figures, the closure and braking device of the invention comprises substantially a box-like body 2 formed from two parallel plates 4, 4' joined together by screws 6.

**[0008]** The space between said plates 4, 4' houses a slider 8 comprising a braking member 10 (consisting of a rotary damper of known type) with a pinion 12 fixed on its shaft.

**[0009]** The braking member is pivoted to the box-like body on a pin 14 and is interfered with by a cylinder 16 housed in a longitudinally slotted seat 10.

**[0010]** A rack 20 present on a bent edge 22 of the plate 4 faces the pinion.

**[0011]** The slider 8 is also provided with a vertical pin 24 provided lowerly with a coupling member 26 presenting a seat 28 (the purpose of which is clarified hereinafter) and a peg 30 guided along a groove 32 provided in the other bent edge 34 of the plate 4.

**[0012]** The groove 32 comprises a substantially curved end portion 36.

**[0013]** Finally, the slider 8 is coupled to the end of a spiralled flat spring 38 of constant intensity anchored to a support 40 present on the plate 4.

**[0014]** The device of the invention is fixed by screws along the upper edge of the door 42 of a wardrobe 44, the door also being provided with two trolleys 46 slidable along a rail 48 mounted on the wardrobe top panel.

**[0015]** The device of the invention operates in the following manner starting from the configuration shown in Figure 8 in which the door 42 closes the corresponding wardrobe compartment.

**[0016]** In this configuration:

- the flat spring 38 is completely wound about the support 40,
- the peg 30 of the slider 8 is housed in the end of the rectilinear portion of the groove 32,
- the cylinder 16 interferes with the braking member 10 to keep it raised and hence maintain the pinion 12 engaged in the rack 20,
- the seat 28 of the coupling member 26 is engaged by a peg 50 provided on the wardrobe top panel.

**[0017]** As the door 42 is shifted to give access to the compartment:

- the cylinder 16 moves along the slotted seat, enabling the braking member 10 to fall by gravity to hence allow the pinion 12 to disengage from the rack 20,
- the peg 50 remains blocked in the seat 28 of the coupling member to cause the slider to move relative to the body 2 by being guided by the peg 30 within the groove, hindered only by the elastic reaction of the spring 38.

**[0018]** As the door movement continues, the peg 30 becomes positioned in the curved part of the groove 32 to maintain the position of the slider 8 stable relative to the box-like body 2, the peg 50 disengaging from the seat 28 enabling the door to be shifted freely without any interference.

**[0019]** When the door is to be returned to the configuration in which it closes the compartment, the initial effect of the approach operation is that the coupling member 26 of the seat 28 interferes with the peg 50 such as to return the peg 30 into the rectilinear portion of the groove 32 and enable the box-like body to slide relative to the slider caused by the elastic reaction of the flat spring 38.

**[0020]** During this operation the cylinder 16 moves along the slotted seat in the opposite direction to the preceding, to interfere with the braking member and hence cause the pinion 12 to engage in the rack 20.

**[0021]** The door then travels freely caused by the elastic reaction of the spring, but at the same time is braked

by the engagement of the pinion in the rack.

that the rack (20) is provided on a bent portion (22) of the plate (4).

### Claims

1. A braked closure device for wardrobe doors, **characterised by** comprising:

- a body (2) to be fixed to the door (42) of the wardrobe (44), said door being provided with means (46) for its sliding along rails (48) rigid with the wardrobe,
- a slider (8) slidable within said body (2) and secured to the end of an elastic means (38) having its other end rigid with the body,
- a braking device (10) rigid with the slider and provided with a pinion (12) cooperating with a rack (20) rigid with the body, said pinion interfering resistively with the rack during door closure and passively during door opening,
- means (50) rigid with the wardrobe and interfering with said slider (8) during door opening such as to lock the slider relative to the wardrobe and enable the body (2) to move relative to said slider, to hence load the elastic means (38),
- means (26, 30, 32) for maintaining a stable position of the slider (8), urged by the elastic means (38), relative to the body, and to disengage the locking means (50) to enable the body to travel freely during subsequent opening of the door,

said maintenance and disengagement means (26, 30, 32) interfering with said locking means (50) during subsequent door closure, to enable the body (2) to slide relative to the slider (8), pulled by the elastic reaction of said elastic means (38), said sliding being braked by interference of the pinion (12) with the rack (20).

2. A device as claimed in claim 1, **characterised in that** the body (2) is formed from parallel plates (4, 4').

3. A device as claimed in claim 1, **characterised in that** the elastic means consists of a spiralled flat spring.

4. A device as claimed in claim 1, **characterised in that** the braking device (10) consists of a rotary damper.

5. A device as claimed in claim 4, **characterised in that** the rotary damper is pivoted to the box-like body (2) on a pin (14), a cylinder (16) housed in a slotted seat (10) interfering longitudinally therewith during door closure.

6. A device as claimed in claim 1, **characterised in**

7. A device as claimed in claim 1, **characterised in that** the interference means (50) consist of a peg mounted on the wardrobe top panel.

8. A device as claimed in claim 1, **characterised in that** the maintenance means consist of a coupling member rigid with the slider (8), said means presenting a seat (28) and a peg (30) guided along a slot (32) provided in the plate (4).

FIG. 1

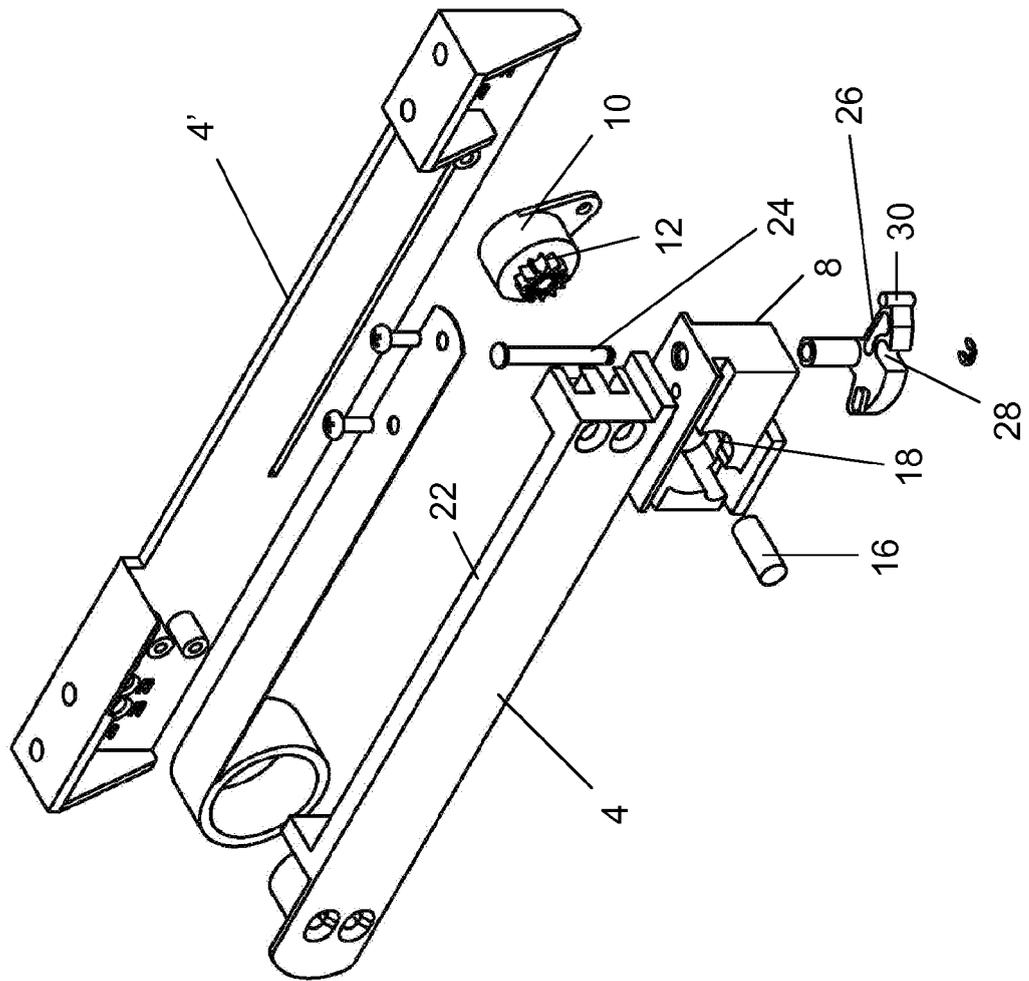


FIG. 2

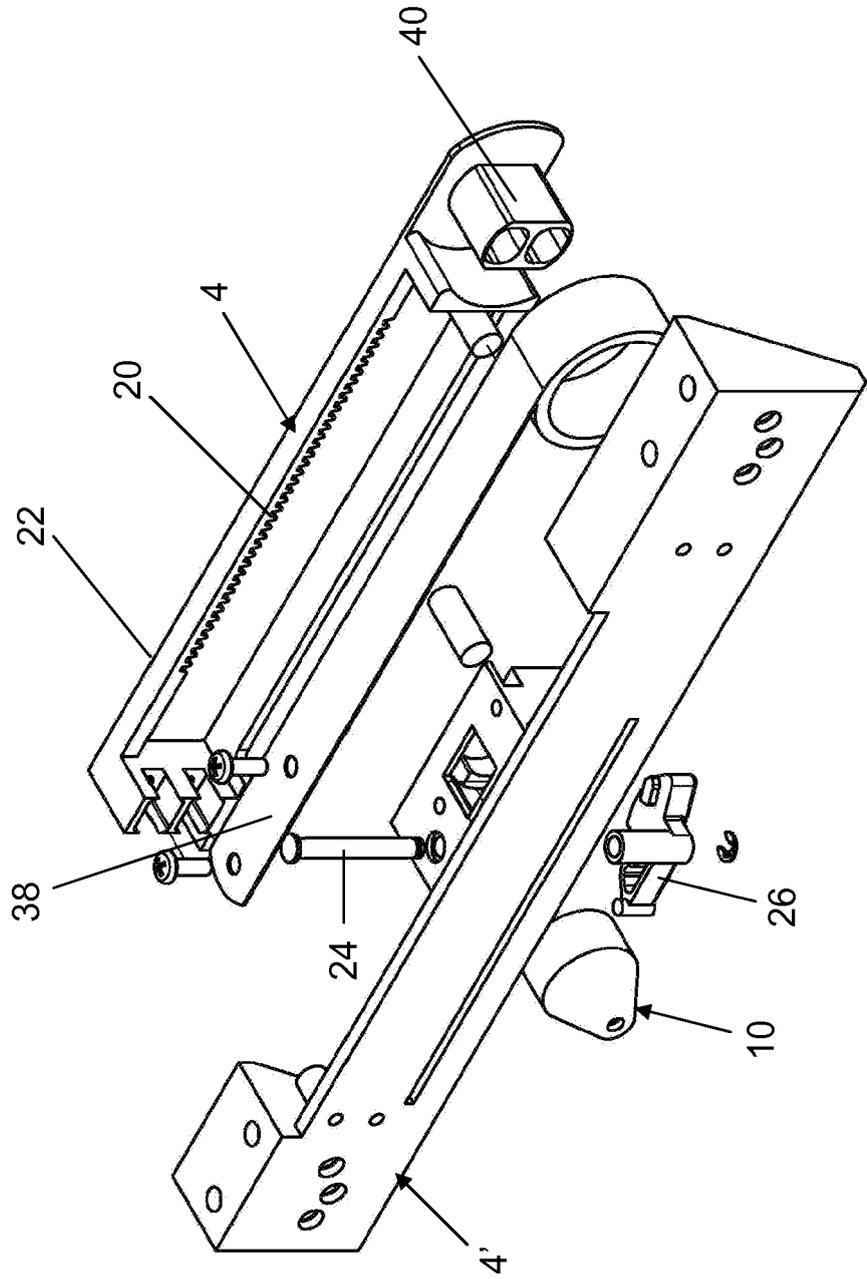


FIG. 3

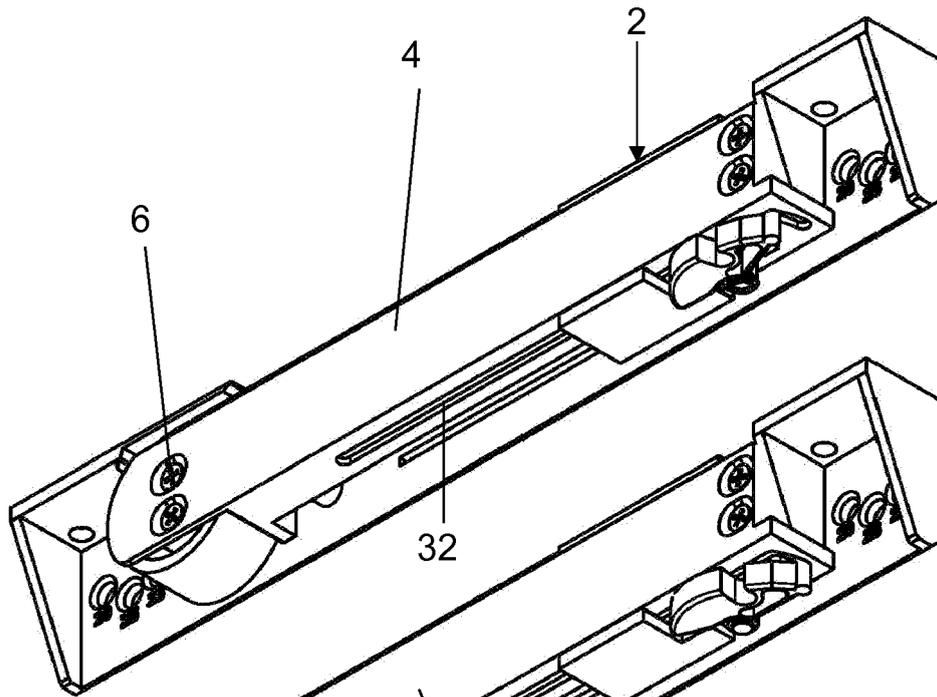


FIG. 4

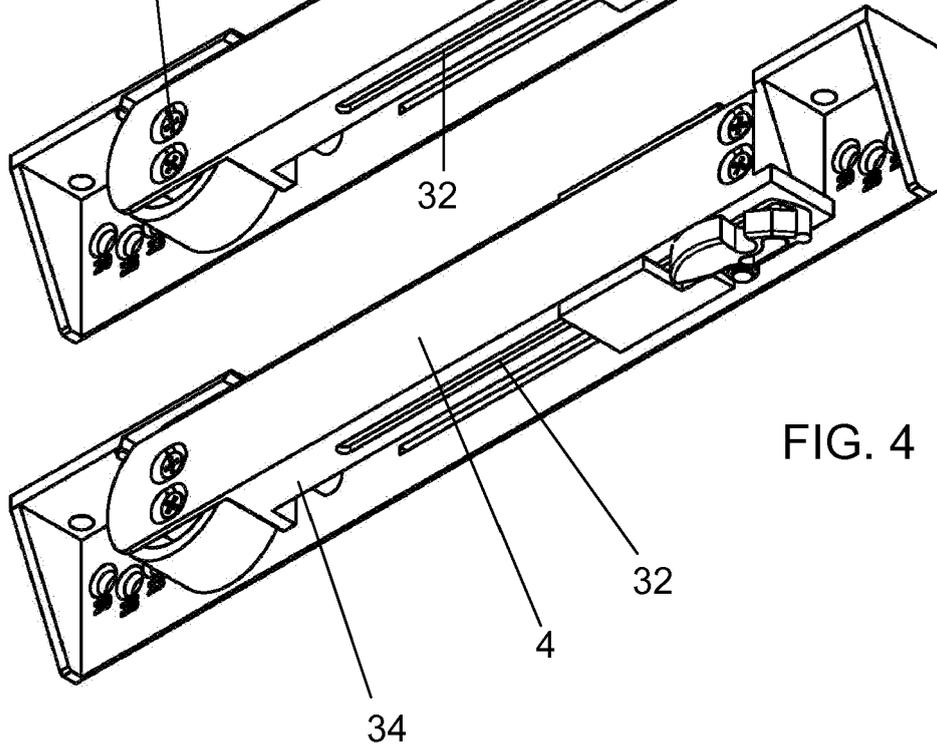


FIG. 5

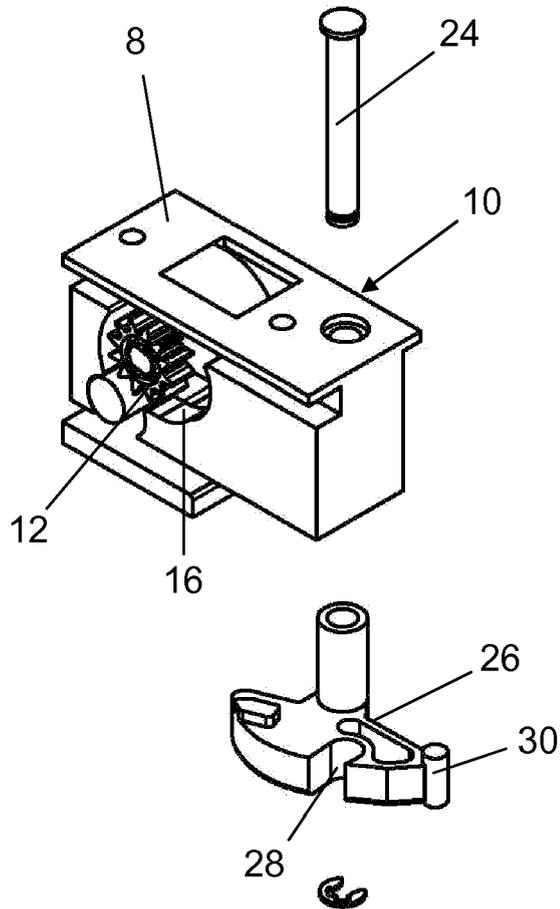


FIG. 6

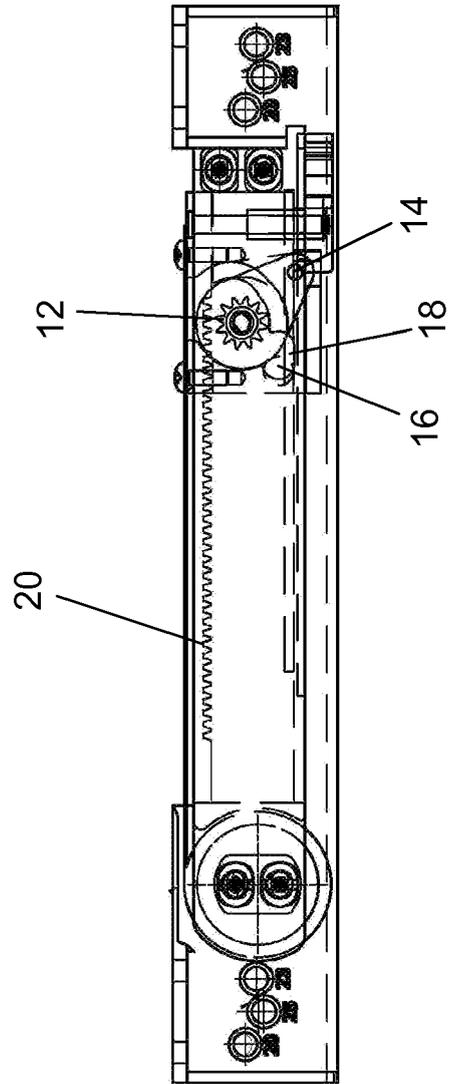


FIG. 7

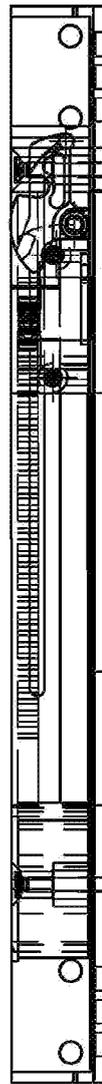


FIG. 8

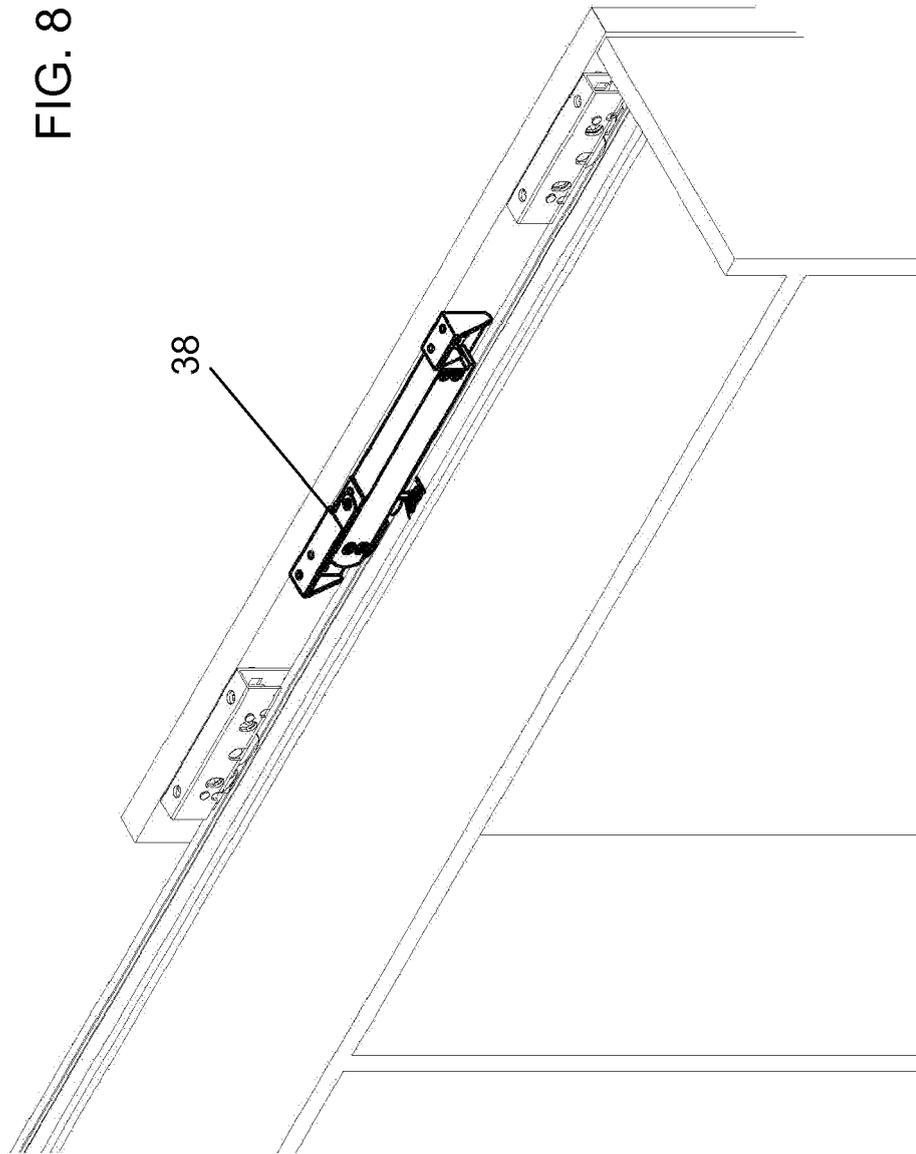


FIG. 9

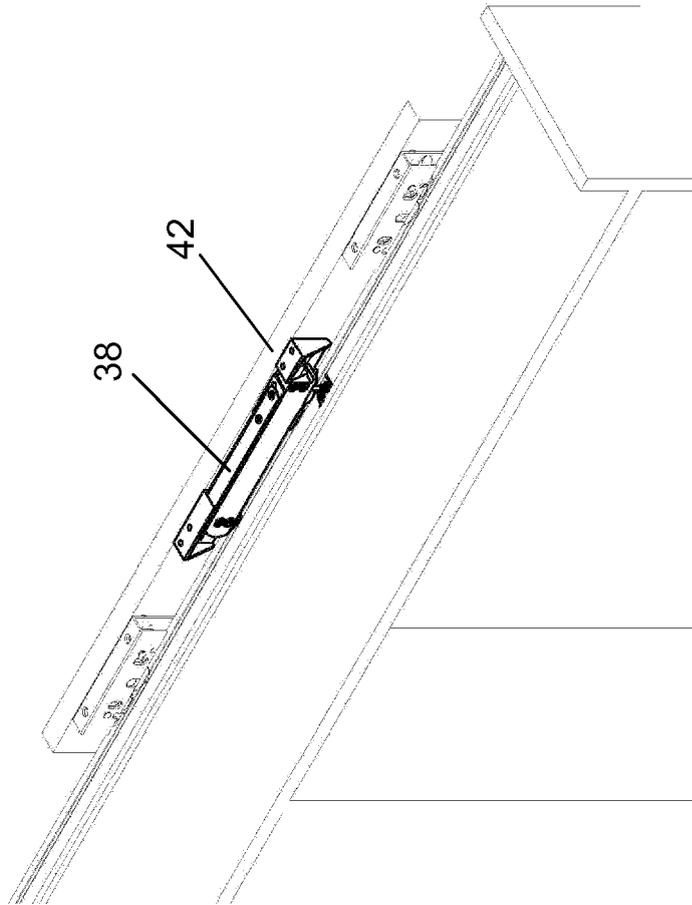
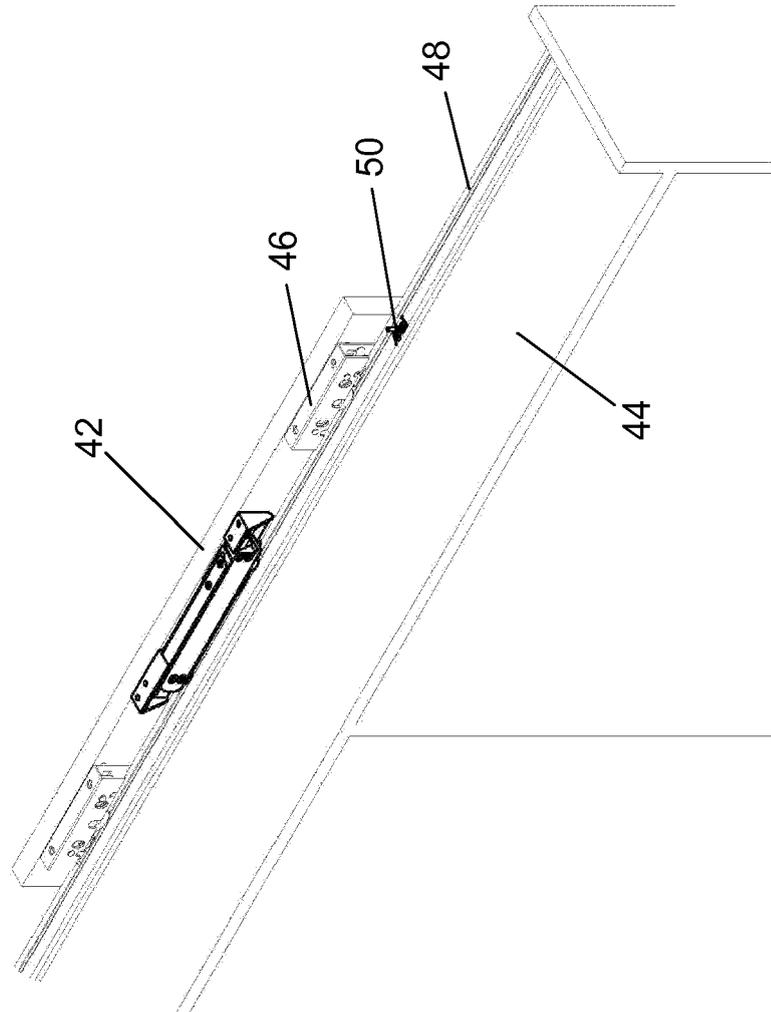


FIG. 10





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 A	EP 1 705 330 A (MURAKOSHI SEIKOH KK [JP]) 27 September 2006 (2006-09-27) * paragraph [0047] - paragraph [0051] * * paragraphs [0058], [0065], [0066] * * paragraph [0070] - paragraph [0076] * * paragraph [0117] - paragraph [0119]; claims 1-6; figures 1-9,21 * -----	1,2,4,6, 7 3,5,8	INV. E05F5/00
X A	GB 2 416 293 A (NIFCO INC [JP]) 25 January 2006 (2006-01-25) * page 10, line 11 - page 21, line 5; claims 1-5; figures 1-3,9-11 * -----	1,2,4,6, 7 3,5,8	
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 May 2008	Examiner Balice, Marco
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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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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