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(54) REFRIGERATED CABINET

(57) A refrigerated cabinet 1 comprising a frame 2 delimiting a compartment 3 that can be closed with at least one door 4 made, at least partially, of a transparent material so as to render the interior of the compartment 3 visible from the outside, the door 4 being coupled by means of hinging, along an essentially vertical axis A, with a first pin 10 (that cooperates with a low hinge 6 fastened to the frame 2) and an elongated pin 13 (that cooperates with a high hinge 7 fastened to the frame 2), the low hinge 6 comprising a first support 8 fastened to the said frame 2, the support 8 determining a first seat 9 designed to rotatably house a first pin 10 coupled to the door 4, the high hinge 7 comprising a frame 11 fastened to the frame 2, a gas spring 12 with a first end 12A constrained to the frame 11 at a first constraining point 30A and a second end constrained to a first end 14A of a lever 14, the second end 14B of the lever 14, during use, being torsionally coupled to the elongated pin 13.

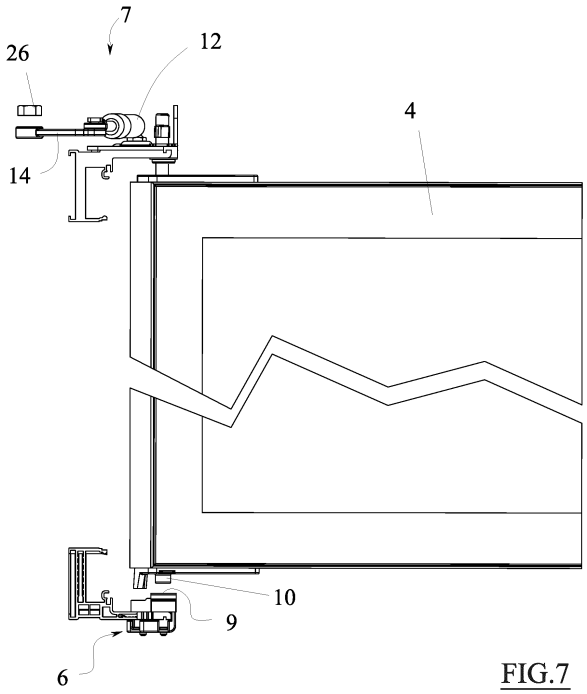

FIG.7

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Description

FIELD OF THE INVENTION

[0001] This invention relates to a refrigerated cabinet.
[0002] In particular, it refers to a refrigerated cabinet with doors.

STATE OF THE ART

[0003] In supermarkets or any other establishment where goods that must be stored or maintained at a controlled temperature are sold, the goods are displayed in refrigerated cabinets.
[0004] These are essentially large refrigerators equipped with multiple visible shelves which a buyer can open themselves to take out the pre-packaged goods displayed, such as cured meats and cheeses but also drinks.
[0005] In order to reduce electricity consumption, these cabinets, which are also called open-front multi-deck cabinets, can feature doors made of glass, or another transparent material, which must be opened to take out the goods.
[0006] The doors are hinged along a vertical axis and, in order to fulfil their insulating function by preventing heat dispersion, they are easily opened and closed or even close automatically.
[0007] To allow hinging, commonly known cabinets feature extremely bulky hinges.
[0008] WO 2023 100041-A1 describe a hinge known in the art. The mounting of the door in this hinge is extremely difficult and time-consuming.

SUMMARY OF THE INVENTION

[0009] The object of the present invention is to provide a refrigerated cabinet which is improved compared with the prior art.
[0010] A further object of the invention is to provide a refrigerated cabinet that features a simple, compact hinging system equipped with a gas spring for automatic closure or to make door movement easier.
[0011] Again, another object of this invention, is to provide a hinge system that allows a quick and efficient mounting or demounting of the door coupled to the hinge.
[0012] This and other objects are achieved by means of a refrigerated cabinet according to the technical teachings of the claims annexed hereto.
[0013] Advantageously, the refrigerated cabinet according to the present invention ensures easy fitting and removal of the door.

BRIEF DESCRIPTION OF THE FIGURES

[0014] Further features and advantages of the innovation will become clearer in the description of a preferred but not exclusive embodiment of the device, illustrated - by way of a non-limiting example - in the drawings appended hereto, in which:

Figure 1 is a perspective view of a high hinge of the cabinet according to the present invention;

Figure 2 is an exploded perspective view of the hinge in Figure 1;

Figure 3 is a side view of a detail of the hinge in Figure 1;

Figure 4 is a section view taken along line IV-IV in Figure 3;

Figure 5 is an exploded perspective view of the detail in Figure 3;

Figures 6 to 9 show successive door fitting stages; and

Figure 10 is a top-down plan view of a cabinet according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0015] With reference to the figures stated, reference number 1 in Figure 10 is used to denote, as a whole, a refrigerated cabinet.
[0016] It may be an upright refrigerated cabinet, also known as an "open-front multi-deck cabinet", with doors.
[0017] The refrigerated cabinet may comprise a plurality of shelves on which goods that must be kept at a controlled temperature are displayed, such as drinks, packaged cured meats, packaged cheeses, etc.
[0018] The refrigerated cabinet 1 may be used in retail establishments whose purpose is to sell mainly food items, such as supermarkets, delicatessens, dairies, etc.
[0019] With reference to Figure 10, it should be noted that the refrigerated cabinet 1 comprises a frame 2 that delimits a compartment 3 that can be closed with at least one door 4 (more specifically four doors 4), the said door being made at least partially of glass (or another transparent material), so as to render the inside of the compartment 3 visible from the outside.
[0020] The door 4 is coupled, by hinging along an essentially vertical axis A, with a first pin 10 that cooperates with a low hinge 6 (Fig. 9) fastened to the frame 2 and an elongated pin 13 that cooperates with a high hinge 7 fastened to the frame 2.
[0021] As can be seen in Figure 6, the low hinge 6 comprises a first support 8 fastened to the said frame 2, the support 8 forming a first seat 9 designed to rotatably house a first pin 10 coupled with the door 4.
[0022] The high hinge 7, which can be seen clearly in Figures 1 and 2, comprises a frame 11 fastened to the frame 2 (for example by means of screws housed in appropriate holes 100), a gas spring 12 equipped with

a first end 12A constrained to the frame 11 at a first constraining point 30A, and a second end constrained to a first end 14A of a lever 14.

[0023] The second end 14B of lever 14, in use (Fig. 1), is torsionally coupled to the elongated pin 13.

[0024] To achieve this coupling, the lever 14, at the second end 14B thereof, can feature a hollow second seat 24 (with a through cavity, for example with a square shape) which is configured so as to create a torsional shape-matched coupling with a corresponding portion 25 of the elongated pin 13 by fitting the lever 14 onto the elongated pin.

[0025] Obviously, the portion 25 of the elongated pin 13 will have the same configuration or shape as the hollow seat 24, in this case, for example, with a quadrangular section (with rounded corners).

[0026] Other configurations of the hollow seat 24/portion 25 will certainly be possible to create the said torsional coupling (for example hexagonal, splined, etc).

[0027] To prevent the lever 14 slipping off the elongated pin 13, the latter may have a thread 13A for coupling with a nut 26. Obviously, other anti-slippage means may be used instead of the nut 26 and the thread 13A, such as a retainer ring, a split pin, etc. engaged in an appropriate recess.

[0028] The thread 13A may therefore be arranged at a free end of the elongated pin 13, so as to prevent the lever 14 from slipping off the pin when the nut 26 (for example a self-locking nut) is screwed onto the elongated pin, as in Figure 1.

[0029] The configuration described above minimises hinge height, making the said hinge extremely compact.

[0030] Advantageously, the frame 11 can determine a cylindrical seat 15 inside which a bushing 16 is housed, engaged with the elongated pin 13. In practice, the elongated pin 13 is inserted into an axial hole 18 in the bushing 16.

[0031] The bushing 16 can be determined by an outer part 16A inserted into the first cylindrical seat 15A and by an inner part 16B inserted into the outer part and equipped with the aforesaid hole 18 for coupling with the elongated pin 13.

[0032] An advantageous configuration of the bushing envisages that the inner part 16B features an external curvature 19 which cooperates slidingly with an internal wall 20 of the outer part 16A, endowed with a concavity corresponding to that of the external curvature 19 of the inner part 16B.

[0033] In this way, the inner part 16B of the bushing can tilt by a few degrees, thereby allowing easy fitting of the door 4, as will be described later.

[0034] To lock the outer part 16A of the bushing in the cylindrical seat 15A, the said outer part 16 can feature a flange 21 resting on an edge of the first cylindrical seat 15A in the frame 11, and a groove 22 for housing a snap ring 23 for fastening the said bushing in the cylindrical seat 15A.

[0035] In this way, the bushing is secured firmly inside the cylindrical seat.

[0036] Advantageously, the frame 11 has a second cylindrical seat 15B (completely identical to the first 15A but positioned in an essentially specular manner) equipped with an additional bushing 16 and a second constraining point 30B for the first end 12A of the gas spring 12 (also specular to the first constraining point 30A).

[0037] In this way, the high hinge 7 can be adapted, during fitting, for either a right- or a left-opening door 4. Simply choose at which constraining point to fasten the first end of the gas spring 12 and in which of the two bushings 16 to insert the elongated pin 13.

[0038] To end the description, it should be noted that the first pin 10 (which engages with the low hinge 6) can extend from a plate that can be fastened to the door 4.

[0039] Similarly, the elongated pin 13 can also extend from a plate 130 that can be fastened to the door 4 (for example, by means of screws that fit into the holes 101).

[0040] It should be noted that, with the present invention, the plate 130 can be fastened to the door 4 (e.g. though screws inside holes 101) even before fitting the pin 13 into the high hinge 7, or the door 4 can already be equipped with a pin 13 e.g. integral with the door.

[0041] Thanks to the design of the high hinge 7, door fitting is extremely simple; it is illustrated, step by step, in Figures 6-9.

[0042] Preliminarily, as shown in Figure 6, the door 4 already equipped with the pin 130, is slightly tilted and the elongated pin 13 is inserted into the hole 18 in the bushing 16. In this step, the lever 14 and the nut 26 are obviously uncoupled from the elongated pin 13.

[0043] The bushing 16, with its particular configuration, allows sufficient angular tilting to allow the elongated pin 13 to be inserted into the hole 18, even with the door tilted.

[0044] Subsequently, as shown in Figure 7, the door 4 is straightened and first of all the first pin 10 is aligned with the first seat 9 for the low hinge 6, and then the door 4 is lowered (Fig. 8) by inserting the pin 10 into the first seat 9.

[0045] At this point, the door is essentially supported by and hinged onto the low hinge 6 and the high hinge 7.

[0046] It should be noted that the elongated pin 13 is long enough to allow this kind of fitting since it remains perfectly engaged in the bushing 16 while also protruding therefrom just enough for the final fitting steps.

[0047] Finally, the transition from the position shown in Figure 8 to that shown in Figure 9 (door completely fitted) is achieved by simply fitting the lever 14 onto the pin and torsionally coupling the said lever to the said pin. The nut 26 is then screwed onto the threaded part 13A of the elongated pin 13. The door 4 is now fitted.

[0048] We have shown that the invention envisages a high hinge 7 which is extremely compact, especially in terms of height, which makes the door 4 easy to fit (or remove).

[0049] Various embodiments of the innovation have been disclosed herein, but further embodiments may also be conceived using the same innovative concept.

Claims

1. Refrigerated cabinet (1) comprising a casing (2) defining a compartment (3) closable by at least one door (4) made at least partially of transparent material, so as to make visible, from the outside, the interior of the compartment (3), the door (4) being associated, for its hinging along a substantially vertical axis (A), to a first pin (10) cooperating with a low hinge (6) attached to the casing (2) and an elongated pin (13) cooperating with a high hinge (7) attached to the casing (2), the low hinge (6) comprising a first support (8) attached to said casing (2), the support (8) defining a first seat (9) configured to rotably accommodate the first pin (10) associated with the door (4), the high hinge (7) comprising a frame (11) attached to the casing (2), a gas spring (12) having a first end (12A) constrained to the frame (11) at a first constraining point (30A) and a second end (12B) constrained to a first end (14A) of a lever (14), the second end (14B) of the lever (14), in use, being torsionally coupled to the elongated pin (13), the frame (11) defining a first cylindrical seat (15A) within which is housed a bushing (16) engaged with the elongated pin (13), the bushing (16) being defined by an outer part (16A) fitted into the first cylindrical seat (15A) and an inner part (16B) fitted into the outer part and provided with a hole (18) where the elongated pin (13) is fitted, wherein the inner part (16B) has outer convexity (19) that slidably cooperates with an inner wall (20) of the outer part (16A), the inner wall (20) providing a concavity corresponding to the outer convexity (19) of the inner part (16B), so that, when the elongated pin (13) is accommodated in the hole (18) the inner part (16B) of the bushing can tilt by a few degrees, thereby allowing tiling of the door (4), to make the mounting of the door (4) easier.

2. Cabinet (1) according to claim 1, wherein the outer part (16A) of the bushing has a flange (21) that rests on the first cylindrical seat (15A) of the frame (11), and a groove (22) for housing a snap ring (23), to fix the bushing (16) in the first cylindrical seat (15A).

3. Cabinet (1) according to claim 1, wherein the lever (14), at its second end (14B), has a second hollow seat (24) configured to realize a torsional shape coupling with a corresponding portion (25) of the elongated pin (13), by fitting the lever (14) to the elongated pin.

4. Cabinet (1) according to one or more of the preceding claims, wherein the elongated pin (13) has thread (13A) mating with a nut (26), or a groove mating with a snap ring or a cotter pin, said thread or said groove being disposed at a free end of the elongated pin (13), so as to prevent the lever (14) from slipping off the pin (13).

5. Cabinet (1) according to claim 1, wherein the frame (11) has a second cylindrical seat (15B) provided with a bushing (16) and a second constraining point (30B) of the first end (12A) of the gas spring (12), for adapting the hinge, during assembly, to either a right- or left-opening door (4).

6. Cabinet (1) according to claim 1, wherein the first pin (10) extends from a plate fixable to the door (4) .

7. Cabinet (1) according to claim 1, wherein the elongated pin (13) extends from a plate (13A) fixable to the door (4).

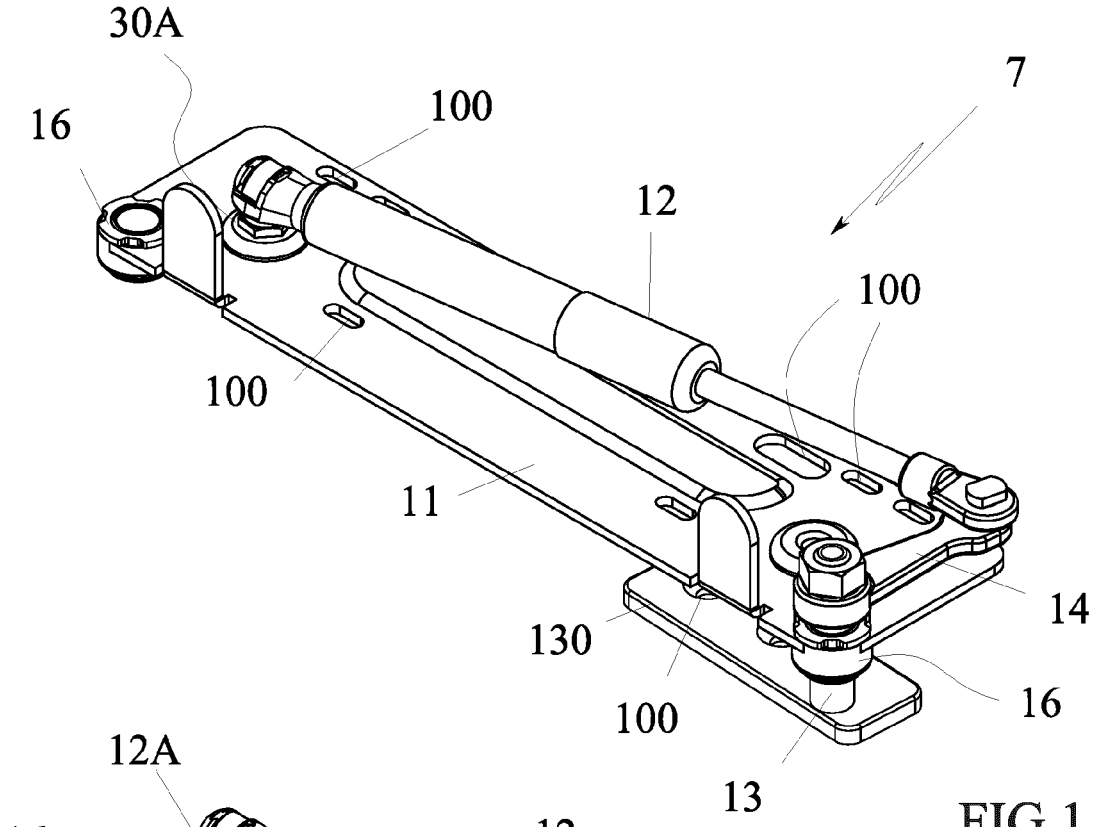
30A
16
100
7
12
100
100
11
14
130
16
100
13

FIG.1

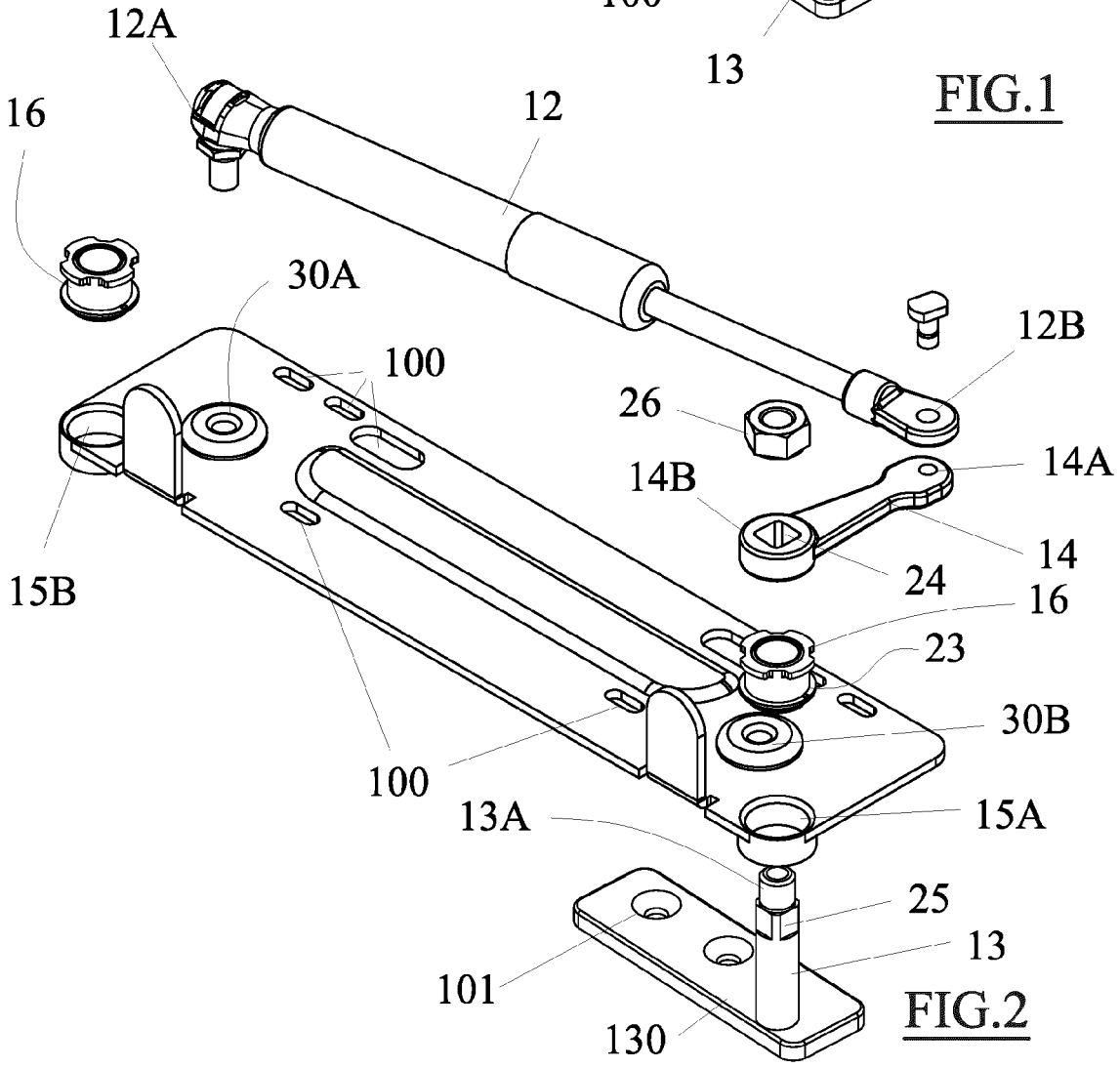
12A
16
12
30A
12B
100
26
14A
14B
14
24
15B
16
23
30B
100
13A
15A
25
13
101
130

FIG.2

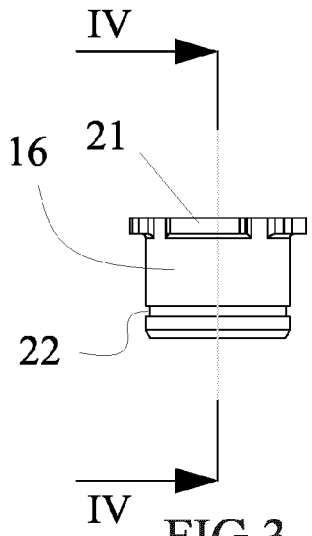

FIG.3

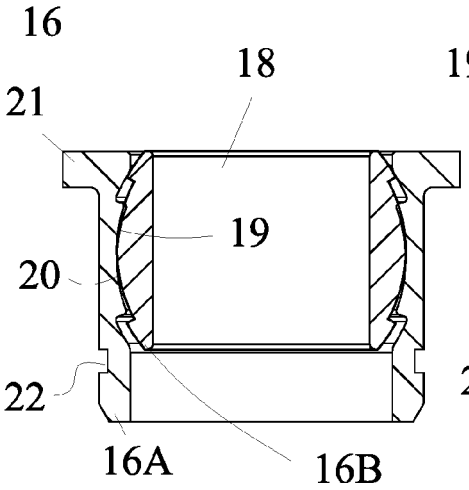

FIG.4

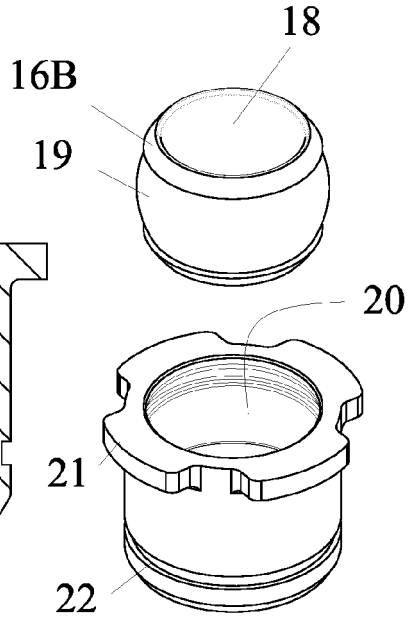

FIG.5

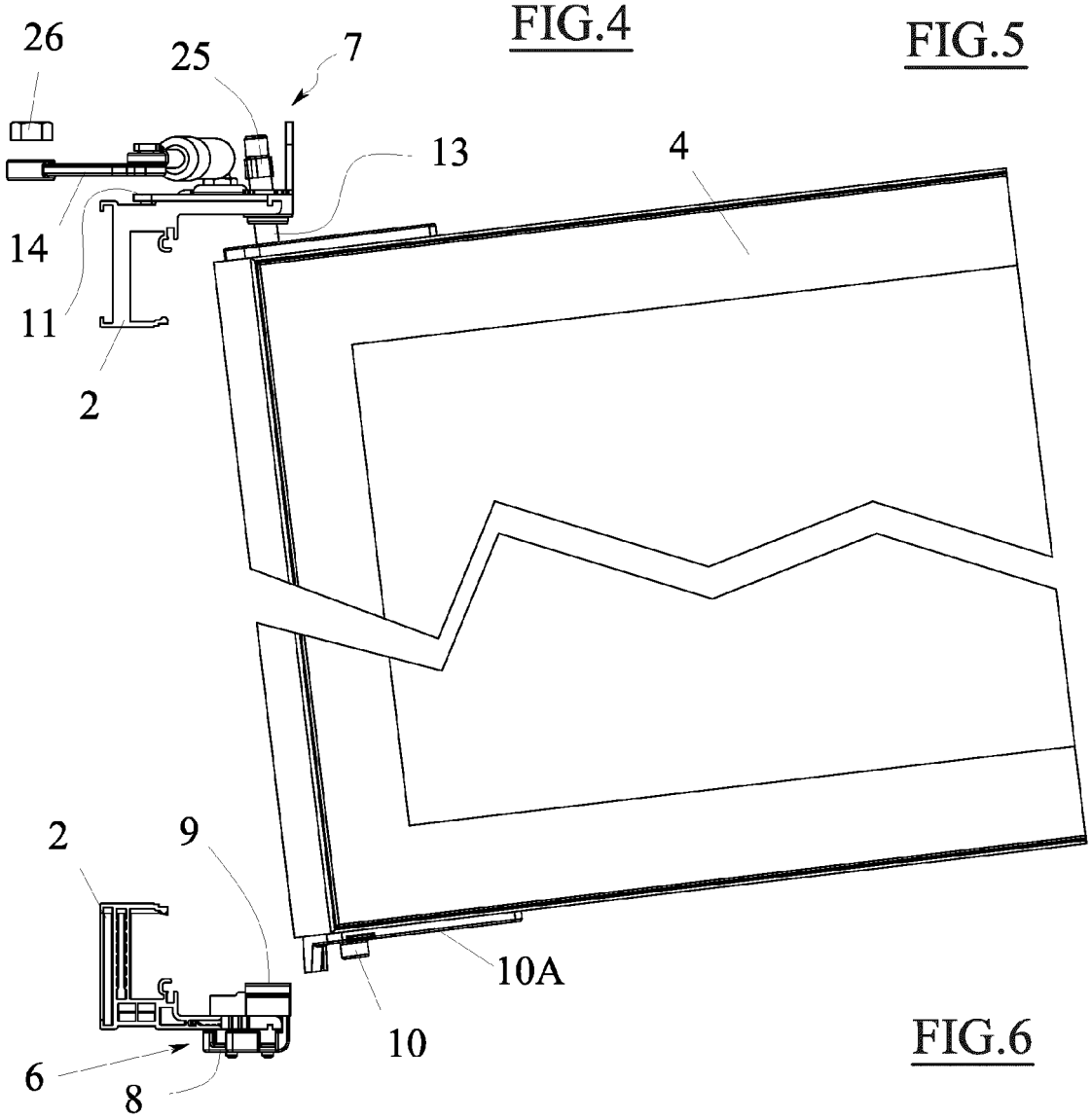

FIG.6

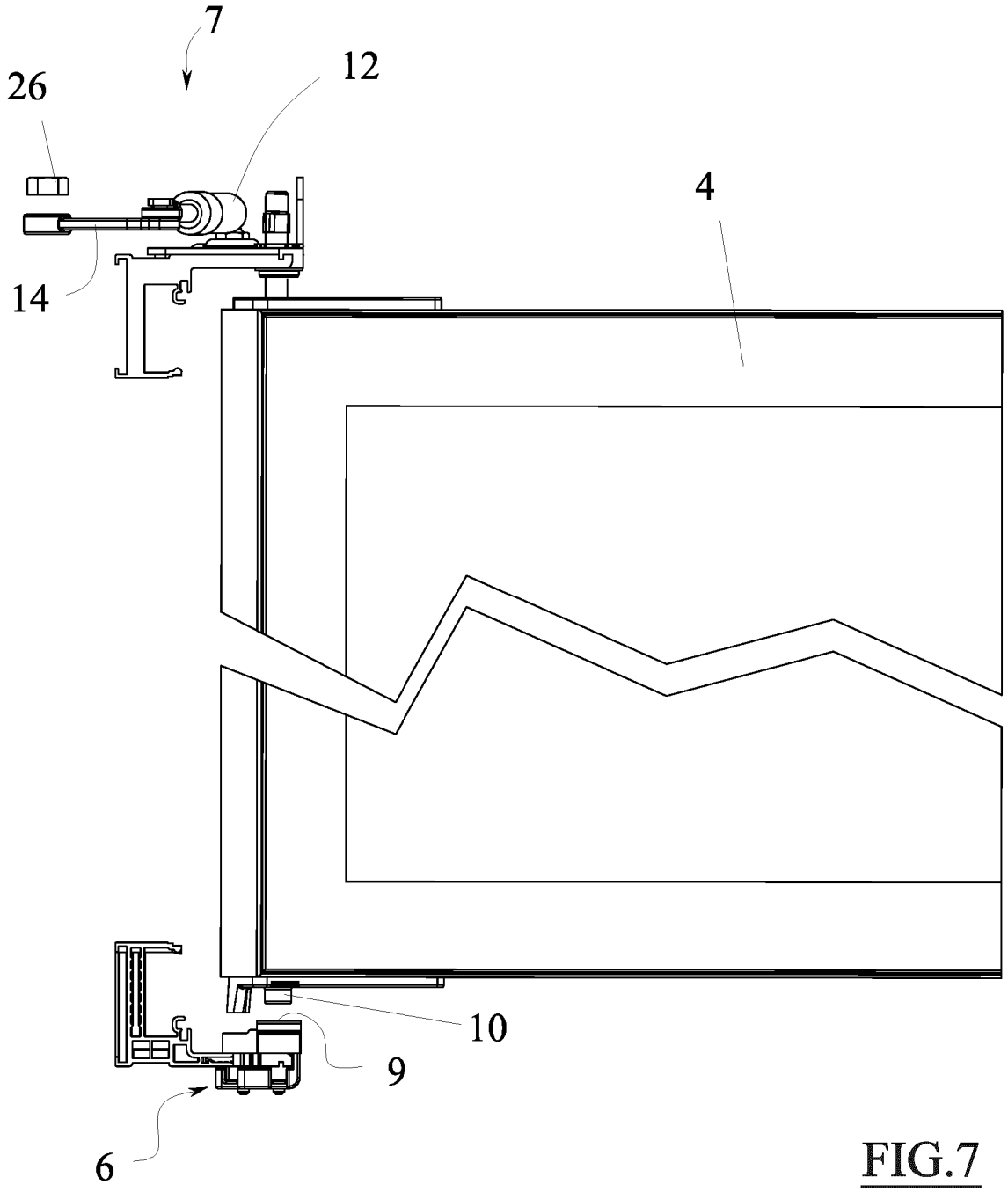

FIG.7

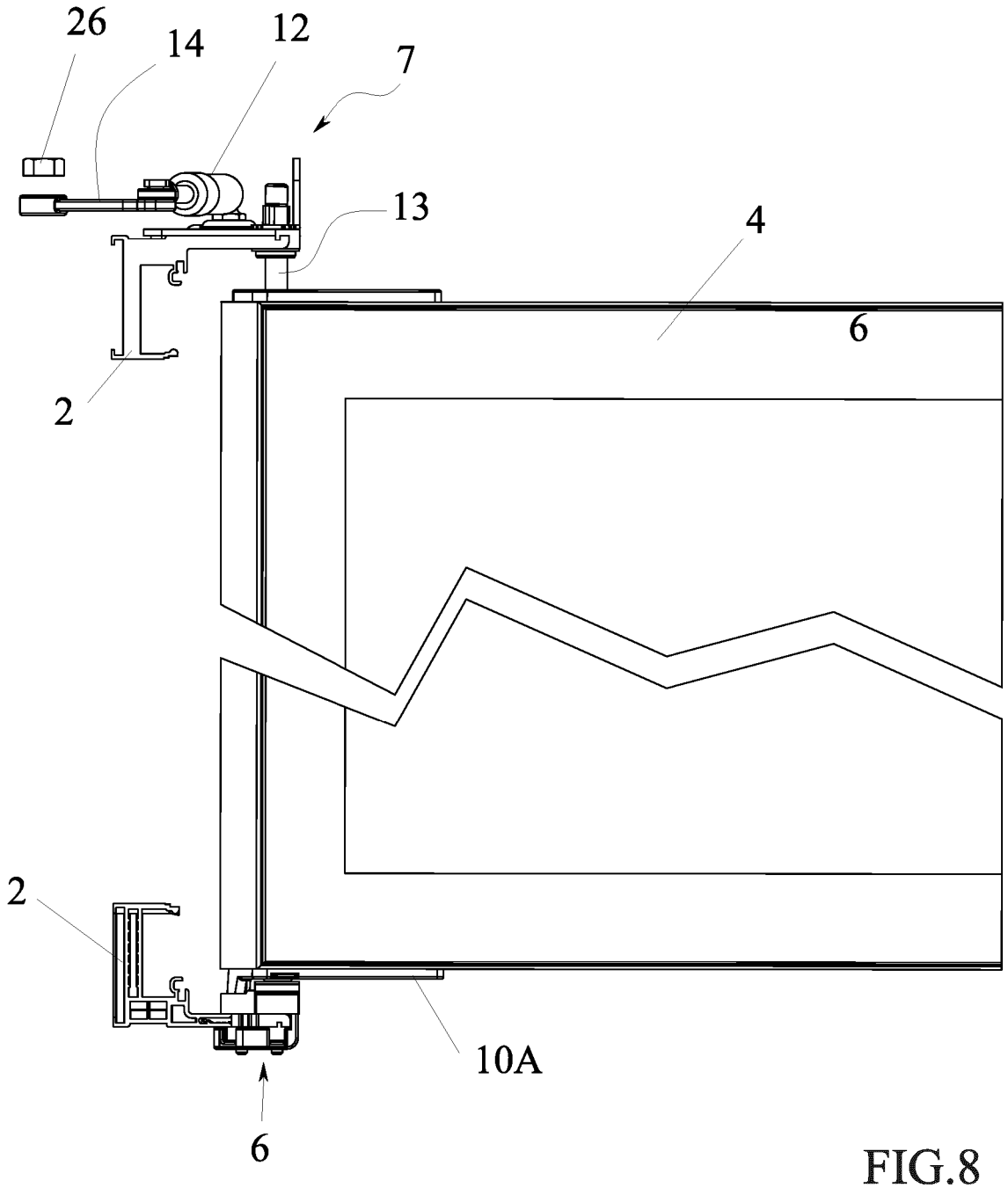

FIG.8

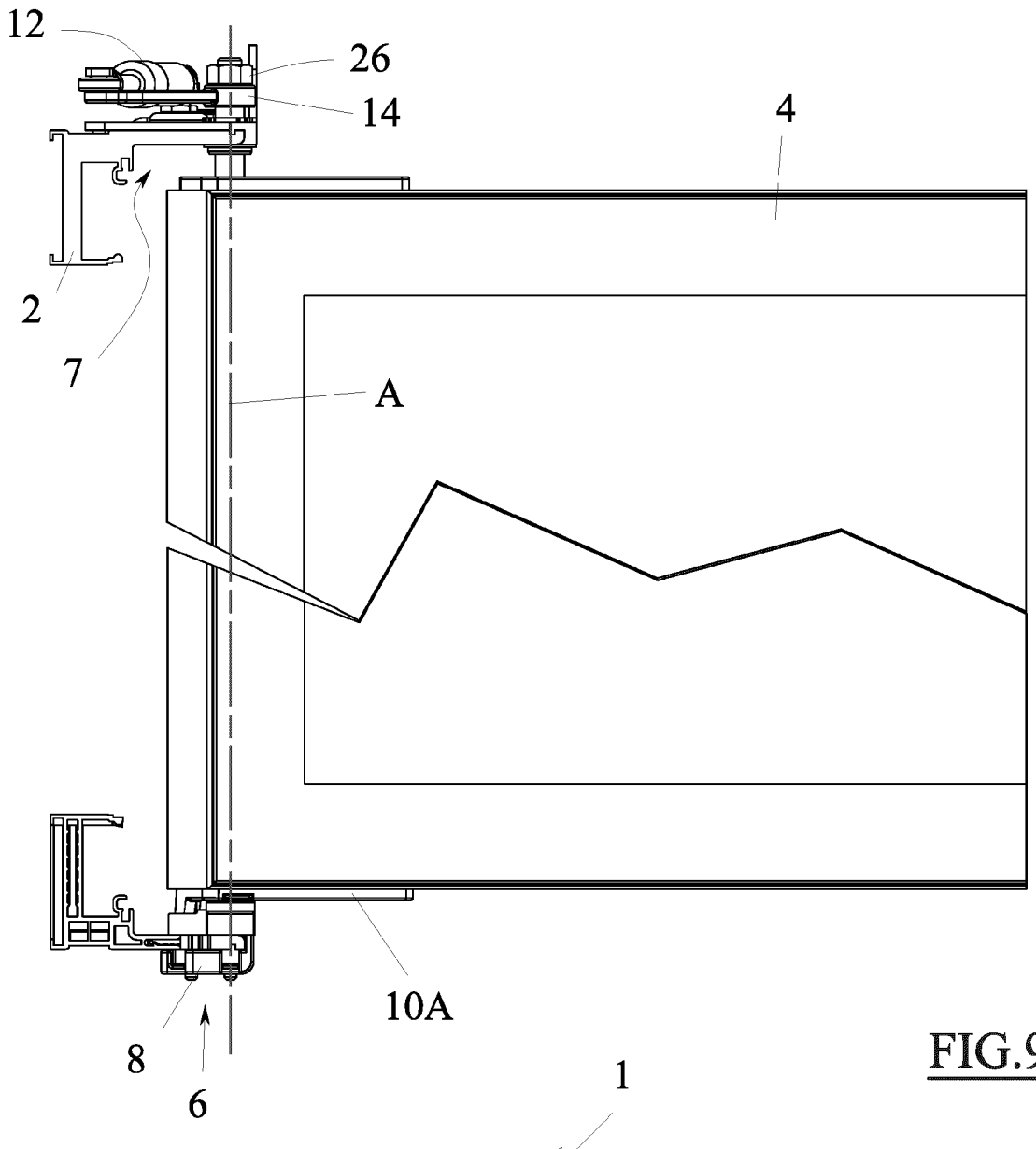

FIG.9

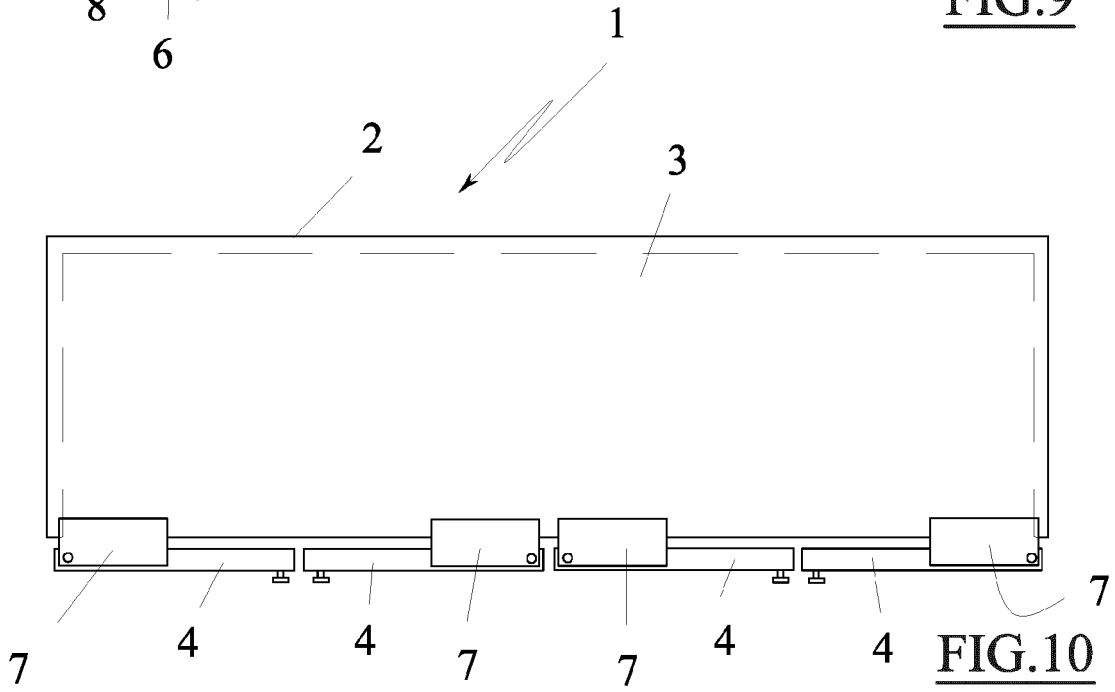

FIG.10

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EUROPEAN SEARCH REPORT

Application Number
EP 24 21 4478

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2023/100041 A1 (CISAPLAST S P A [IT]) 8 June 2023 (2023-06-08) * figures 12-21 *	1-7	INV. F25D23/02 A47F3/04 E05D7/081
A	EP 0 111 019 A1 (ARDCO INC [US]) 20 June 1984 (1984-06-20) * figure 2 *	1-7	
A	EP 3 926 134 A1 (JBG 2 SP Z O O [PL]) 22 December 2021 (2021-12-22) * figures 1,5 *	1-7	

TECHNICAL FIELDS SEARCHED (IPC)

F25D
E05G
A47F
E05D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 March 2025	Kuljis, Bruno

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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14-03-2025

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		PL 246133 B1	09-12-2024

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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