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(54) **Door handle for a domestic refrigeration appliance**

(57) Door handle for a domestic refrigeration appliance wherein said refrigeration appliance comprises a main body and at least one door connected with freedom of rotation to the main body. The handle (1) comprises a tilting actuator (5) that, when it rotates, presses against the front part of the main body assisting in the opening of the door, and at least one gripping arm (6) connected to the actuator (5) to rotate it. The actuator (5) presses against the front wall of the main body when it rotates in either of the two directions. Said actuator (5) rotates in relation to a first axis of rotation when it rotates according to one of the directions, and rotates in relation to a second axis of rotation when it rotates according to the other direction.

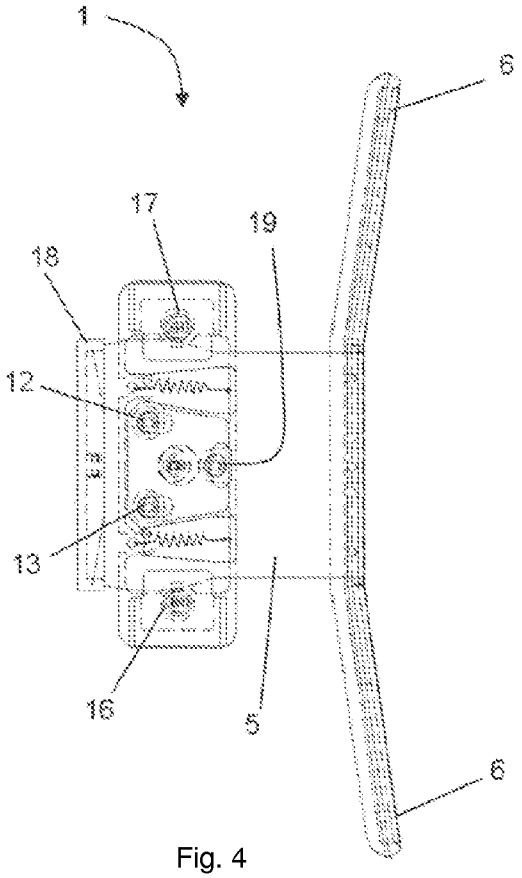

Fig. 4

EP 2 336 689 A2

Description

TECHNICAL FIELD

[0001] This invention relates to door handles for domestic refrigeration appliances, and in particular to handles that reduce the force, exerted by the user, that is necessary to open the door of the domestic refrigeration appliance.

PRIOR ART

[0002] There are known refrigeration appliances incorporating a handle, which, in responding to the movement of said handle, caused by the user, exerts a pressure on the chamber, which causes a physical separation between the chamber and the door, thereby enabling a reduction in the door-opening force exerted by the user.

[0003] DE202005008449U thus discloses a domestic refrigeration appliance that comprises two door handles. The refrigeration appliance comprises two bodies and two doors, the doors being connected with freedom of rotation to said bodies. Each handle, each one disposed on a door, comprises a tilting actuator, with the result that when the user rotates the handle said actuator presses against the front part of the corresponding body, helping the door to separate from the body. The actuator, which is L-shaped, comprises a gripping arm so that the user may operate said actuator.

DISCLOSURE OF THE INVENTION

[0004] It is an object of the invention to provide a door handle for a domestic refrigeration appliance as defined in the claims.

[0005] The handle of the invention is suitable for use in a domestic refrigeration appliance that comprises:

- a main body, and
- at least one door connected with freedom of rotation to the main body.

[0006] Said handle also comprises:

- a tilting actuator that, when it rotates, presses against the front part of the main body, assisting in the opening of the door, and
- at least one gripping arm connected to the actuator to rotate said actuator.

[0007] The actuator presses against the front part of the main body when it rotates in either of the two directions. The actuator rotates in relation to a first axis of rotation when it rotates according to one of the two directions and rotates in relation to a second axis of rotation when it rotates according to the other direction.

[0008] The door handle of the invention enables the door of the domestic refrigeration appliance to be opened with a reduction in the force exerted by the user, and also enables the door to be opened by rotating the handle in either of the two directions.

[0009] These and other advantages and characteristics of the invention will be made evident in the light of the drawings and the detailed description thereof.

DESCRIPTION OF THE DRAWINGS

[0010]

Figure 1 shows an exploded view of an embodiment of the handle of the invention.

Figure 2 shows a perspective of the actuator of the handle of Figure 1.

Figure 3A shows a first side view of a domestic refrigeration appliance with two doors and two handles such as those in Figure 1.

Figure 3B shows a second side view of the domestic refrigeration appliance of Figure 3A with two doors and a handle according to Figure 1 rotated in one direction and with a second handle according to Figure 1 rotated in the other direction.

Figure 4 shows a first side view of the handle of Figure 1 in the rest position.

Figure 5 shows a second side view of the handle of Figure 1 rotated in one direction.

Figure 6 shows a third side view of the handle of Figure 1 rotated in the other direction.

Figure 7 shows a perspective of the stop member of the handle of Figure 1.

DETAILED DISCLOSURE OF THE INVENTION

[0011] Figures 3A and 3B show a domestic refrigeration appliance 2 that includes at least one handle 1 according to the characteristics of the invention and which comprises:

- a main body 3, and
- at least one door 4 connected with freedom of rotation to the body 3 and, in addition, as shown in Figures 1 and 2, the handle of the invention comprises:
- a tilting actuator 5 that, when it rotates, presses against the front part 3a of the main body 3, assisting in the opening of the door 4, and
- at least one gripping arm 6 connected to said actuator 5 to rotate said actuator 5.

[0012] The actuator 5 presses against the front part 3a of the main body 3 when it rotates in either of the two

directions. The actuator 5 rotates in relation to a first axis of rotation 7 when it rotates according to one of the two directions and rotates in relation to a second axis of rotation 8 when it rotates according to the other direction.

[0013] As a result, the handle 1 enables the door 4 of the domestic refrigeration appliance 2 to be opened with a reduction in the force exerted by the user and also enables the door 4 to be opened by rotating the handle 1 in either of the two directions.

[0014] The handle of the invention also comprises at least one support, which is fixed to the door 4, more specifically to the opposite side of the axis of rotation of the door 4, as shown in Figures 3A and 3B, by means of fastening means. The actuator 5 rotates in relation to said support, which comprises a plurality of elements.

[0015] As shown in Figure 5, in the preferred embodiment the first axis of rotation 7 is placed in a first elongated housing 9 and the second axis of rotation 8 is placed in a second elongated housing 10, as shown in Figure 6. Each axis of rotation is associated to a respective rotating pin where a first rotating pin 11 is housed in said first elongated housing 9 and a second rotating pin 12 is housed in said second elongated housing 10. Both the first rotating pin 11 and the second rotating pin 12 are fixed in the support described in the preceding paragraph. In the rest position of the handle 1 both the first rotating pin 11 and the second rotating pin 12 are disposed on the end closest to the stop member 18 of the corresponding elongated housings 9 and 10. This allows that when the user rotates the handle 1 in the direction A, as shown in Figure 5, the first rotating pin 11 remains in the same relative position in relation to the actuator 5, while the second elongated housing 10 moves in relation to the corresponding rotating pin 12, allowing the handle 1 to rotate in relation to the first axis of rotation 7. If the handle 1 rotates in the direction B, as shown in Figure 6, the second rotating pin 12 remains in the same relative position in relation to the actuator 5, while the first elongated housing 9 moves in relation to the corresponding rotating pin 11, enabling the handle 1 to rotate in relation to the second axis of rotation 8. This embodiment is particularly advantageous due to the fact that it enables the pusher surface 21 furthest from the rotating pin 11,12 that does not have relative movement in relation to the actuator 5 to have sufficient movement to enable said pusher surface 21 to press against the corresponding support surface 22 of the front face 3a of the main body 3, while the pusher surface 21 closest to the rotating pin 11,12 that does not have relative movement in relation to the actuator 5 has a minimal movement, thereby preventing it from colliding with the door 4 and thus locking the handle 1 without the door 4 being opened.

[0016] In the preferred embodiment of the invention, as shown in Figure 1, the actuator 5 of the handle 1 comprises a stop member 18 that, when said actuator 5 rotates, presses against a support surface 22 of the front part 3a of the main body 3, helping the door 4 to separate from the front part 3a and thereby reducing the opening force exerted by the user. Preferably, said stop member 18 is L-shaped, as shown in Figure 7. This results in a larger pusher surface 21 of the stop member 18, which interacts with the support surface 21 of the front part 3a, without there being any need to alter the width of the door 4 in order to fit a wider actuator 5. Any other shape of the stop member 18 is possible.

[0017] The actuator 5 is made of metal, preferably steel, and the stop member 18 and actuator 5 may optionally be manufactured as a single piece.

[0018] The stop member 18 is preferably made of plastic so as not to damage the main body 3. Similarly, a metal stop member, made of steel for example, may also be reinforced with an elastic material, rubber for example.

[0019] With the handle 1 of the invention, there is no need to increase the clearance between the main body 3 and the door 4 just because it includes a handle connected to the door 4 which interacts with the main body 3 through one of the sides of the door 4, as shown in Figures 3A and 3B.

[0020] Similarly, as there is a minimum thicknesses difference between the width of the main body 3 and the width of the door 4, an excellent aesthetic effect is achieved, due to the fact that the door 4, when it is closed, conceals the main part of the body 3.

[0021] According to the preferred embodiment, and as shown in Figures 1 and 4, the handle 1 comprises a locking pin 19 housed in a third elongated housing 20 that restricts the rotation of the actuator 5. As can be seen in Figure 2, said third elongated housing is situated in a manner substantially perpendicular to the elongated housings 9 and 10 corresponding to each axis of rotation 7 and 8. The first elongated housing 9, the second elongated housing 10 and the third elongated housing 20 are disposed in such a way that they form a triangle, and where the third elongated housing 20 is vertically equidistant to the other two elongated housings 9 and 10.

[0022] As shown in Figure 2, the actuator 5 comprises an upper and lower surrounding surface 15 on the side closest to the front face 3a of the main body 3. This surrounding surface 15 moves between two guides 16 and 17. Each guide comprises a cylindrical protuberance, not shown in the Figures, in contact with the surrounding surface 15. The profile of the surrounding surface 15 is such that as it is in contact with the protuberances of the guides 16 and 17, it causes the handle 1 of the invention to move in a smooth and guided manner, enabling the required rotation of the handle 1 and preventing the actuator 5 of the handle 1 from moving off-centre. To achieve a uniform and guided rotation of the handle 1 other shapes of surrounding surface are possible.

[0023] The handle 1 of the invention, as shown in Figure 1, also comprises elastic means that, in the rest position of the handle 1, are expanded and thus guarantee that the rotating pins 11 and 12 remain disposed in the end closest to the stop member 18 of the corresponding elongated housings 9 and 10. In the preferred embodiment said elastic means correspond to a first spring 13,

linked to the first axis of rotation 7, and to a second spring 14, linked to the second axis of rotation 8. Said elastic means enable the handle 1 to return to its original position once the user stops acting on the handle 1. When the handle 1 rotates in the direction A the first spring 13 returns to its rest position and may even be compressed, and the second spring 14 expands, as shown in Figure 5. As a result, when the user stops exerting a force on the handle 1, it tends to return to its equilibrium position, which is the rest position. Similarly, when the handle 1 rotates in the direction B, as shown in Figure 6, the second spring 14 returns to its rest position and may even be compressed and the first spring 13 expands, helping the handle 1 to return to its initial position or the rest position when the user stops acting on the handle 1. The fact that there are two springs working in opposite directions enables springs of a smaller size to be used.

[0024] To improve the operating of the handle 1, it comprises two gripping arms 6, one upper and the other lower, connected to the actuator 5 as shown in Figures 1 and 2, and to improve the feel of said gripping arms 6 these are lined or protected by coverings that may vary in shape and texture. In the preferred embodiment a covering is used that covers both the upper arm 6 and the lower arm 6.

[0025] By pulling or pushing the upper gripping arm 6 the door 4 is opened, as is the case by pulling or pushing the lower gripping arm 6. As shown in Figure 5, when the handle 1 is pushed by the upper gripping arm 6 according to the direction F1 or pulled by the lower gripping arm 6 according to the direction F2, the handle 1 rotates according to the direction A. And as shown in Figure 6, when the upper gripping arm 6 is pulled according to the direction F3 or the lower gripping arm 6 is pushed according to the direction F4, the handle 1 rotates according to the direction B.

[0026] The handle 1 of the invention adapts perfectly to the specific characteristics of each user. For example, the handle 1 is suitable for tall and short users and users of medium height as it comprises two gripping arms 6, each one of which is disposed at different heights. It is also adapted to users accustomed to pulling the handle and to those users accustomed to pushing the handle.

Claims

1. Door handle for a domestic refrigeration appliance, the refrigeration appliance (2) comprising
   a main body (3), and
   at least one door (4) connected with freedom of rotation to the body (3), and
   the handle (1) comprising
   a tilting actuator (5) that, when it rotates, presses against the front part (3a) of the main body (3), assisting in the opening of said door (4), and
   at least one gripping arm (6) connected to said actuator (5) to rotate said actuator (5),
   characterised in that the actuator (5) presses against the front part (3a) when it rotates in either of the two directions, said actuator (5) rotating in relation to a first axis of rotation (7) when it rotates according to one of the directions, and the actuator (5) rotating in relation to a second axis of rotation (8) when it rotates according to the other direction.

2. Handle according to claim 1, wherein the actuator (5) comprises a first elongated housing (9) where a first rotating pin (11) is housed and a second elongated housing (10) where a second rotating pin (12) is housed, enabling one of said elongated housings (9,10) to move in relation to the corresponding rotating pin (11,12) with the result that the actuator (5) rotates according to a first axis of rotation (7) housed in said first elongated housing (9) or according to a second axis of rotation (8) housed in said second elongated housing (10).

3. Handle according to claim 2, comprising at least one support that is fixed to the door (4) by fastening means and in relation to which the actuator (5) rotates, and wherein the first rotating pin (11) and the second rotating pin (12) are fixed on said support.

4. Handle according to any of claims 1 to 3, wherein the actuator (5) comprises a stop member (18) that, when said actuator 5 rotates, presses against a support surface (22) of the front part (3a) of the main body (3), assisting in the opening of the door (4).

5. Handle according to claim 4, wherein said stop member (18) is preferably L-shaped so as to have a larger pusher surface (21) comprised on said stop member (18) and which interacts with the support surface (22) of the front part (3a) of the main body (3).

6. Handle according to claims 4 or 5, wherein said stop member (18) is made of plastic.

7. Handle according to claims 4 or 5, wherein said stop member (18) comprises a metal base reinforced with an elastic material, preferably rubber, so as not to damage the main body (3).

8. Handle according to claim 7, wherein the stop member (18) is built into the actuator (5).

9. Handle according to any of the preceding claims, comprising elastic means, preferably springs, that enable the handle (1) to return to its original position once the user stops acting on the handle (1).

10. Handle according to claim 9, comprising at least one first spring (13) and at least one second spring (14), the first linked to the first axis of rotation (7) and the second linked to the second axis of rotation (8).

11. Handle according to any of the preceding claims, wherein the actuator (5) comprises an upper and lower surrounding surface (15) on the side closest to the front face (3a) of the main body (3), said surrounding surface (15) moving between two guides (16, 17), enabling the actuator (5) to move in a guided manner.

12. Handle according to any of the preceding claims, comprising two gripping arms (6), one upper and the other lower, enabling the door (4) to be opened by pulling or pushing the upper gripping arm (6), or by pulling or pushing the lower gripping arm (6).

13. Handle according to any of the preceding claims, also comprising a locking pin (19) that restricts the rotation of the actuator (5) once the door (4) has been opened.

14. Domestic refrigeration appliance **characterised in that** it comprises at least one handle (1) according to any of the preceding claims.

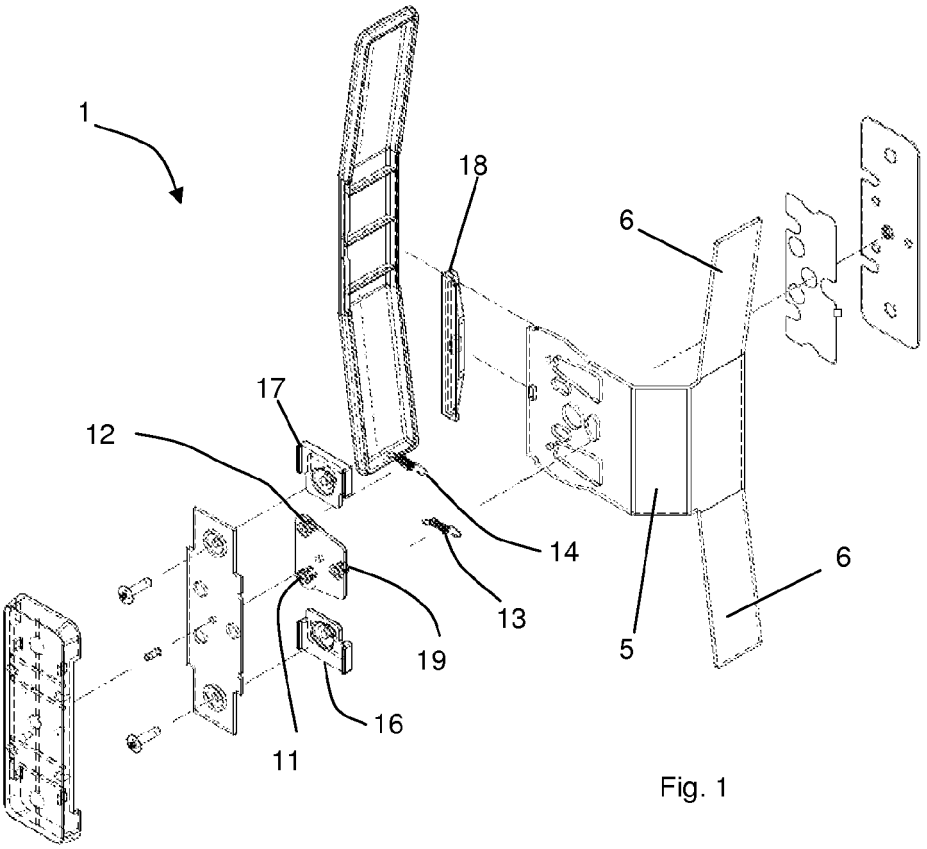

Fig. 1

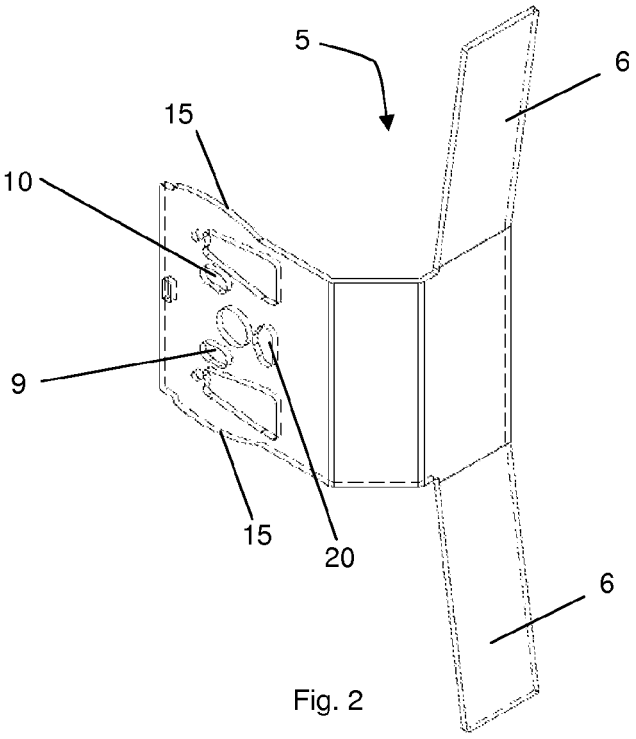

Fig. 2

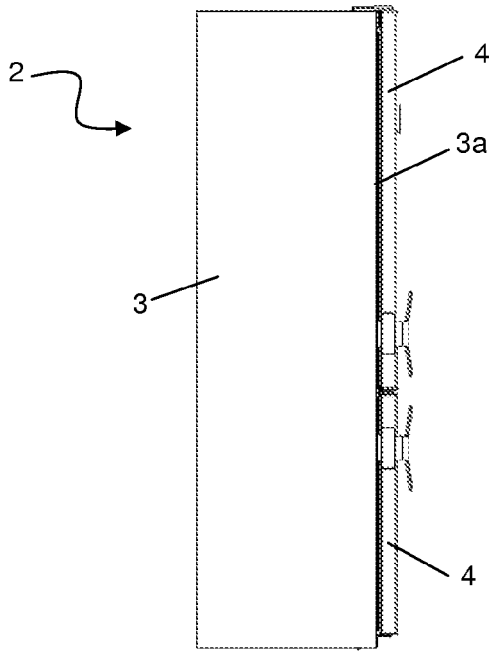

Fig. 3A

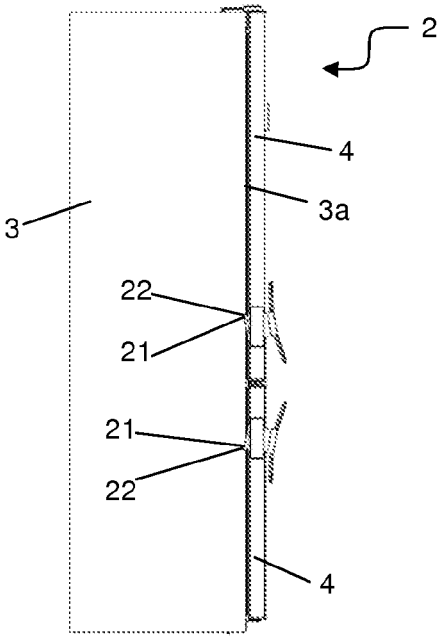

Fig. 3B

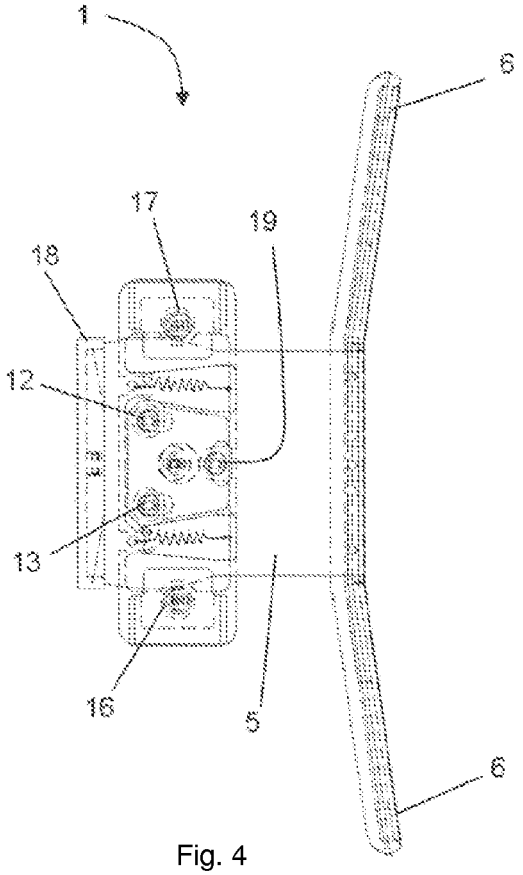

Fig. 4

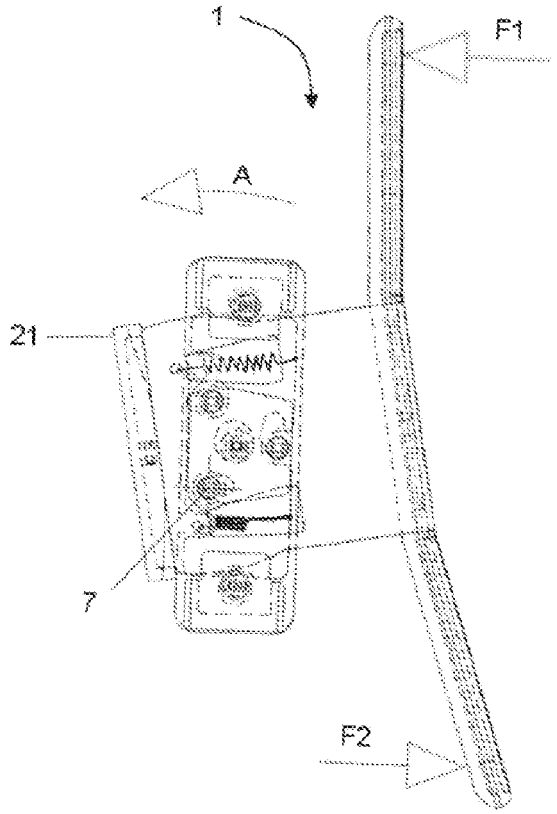

Fig. 5

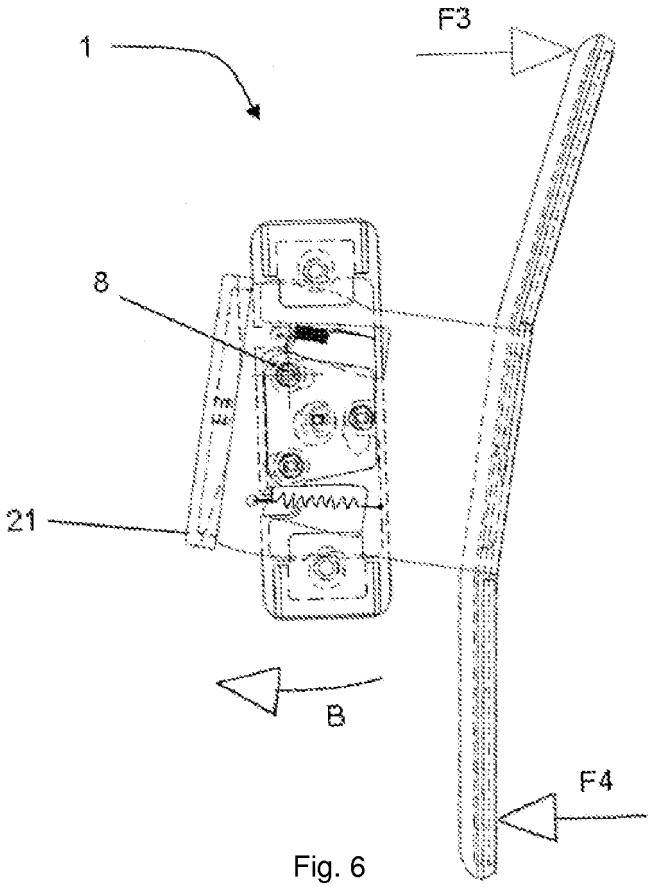

Fig. 6

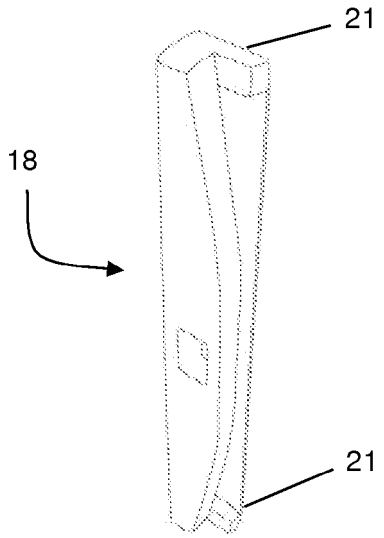

Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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