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(54) Refrigerated cabinet with an apparatus for keeping the door ajar

(57) Refrigerated cabinet comprising a compartment (2) for the storage of products to be preserved, a door (3) hinged on to the cabinet and adapted to move into contact with a frame (4) of said cabinet to close in an air-tight manner the storage compartment (2), retaining means adapted to hold the door (3) in the closed position thereof, and at least an apparatus (5) to keep the door (3) ajar so as to facilitate aeration of the storage compartment (2) during the periods in which the refrigerator is not in use. The apparatus (5) comprises an arm (6) that is coupled in a movable manner to an accommodating structure (7), which is adapted to support the arm (6) in an operative position and in a non-operative position thereof, said structure (7) being associated to said door (3) or said frame (4), and said arm (6) being capable of being selectively guided into said operative position and said non-operative position thereof; in said operative position thereof, said arm (6) protrudes from said door (3), or said frame (4), so as to abut against said door (3) or said frame (4) of the storage compartment (2), thereby preventing the door (3) from coming into contact with the abutting frame so as to keep the door (3) ajar; in the non-operative state thereof, said arm (6) is on the contrary fully contained within said accommodating structure (7), thereby enabling the door (3) to fully move into closing the storage compartment in an air-tight manner.

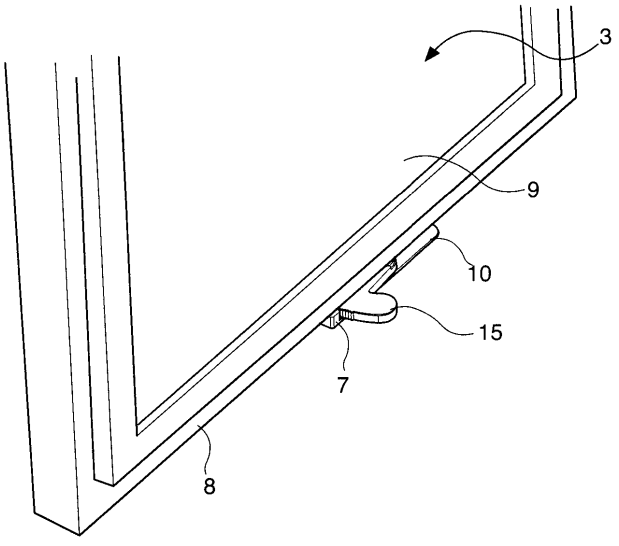

Fig. 3

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Description

[0001] The present invention refers to a refrigerated cabinet that is provided with an apparatus intended for keeping its door ajar, i.e. in a half-open position.

[0002] Refrigerated cabinets are commonly known to usually comprise a compartment intended for the storage of products, a door hinged on to the cabinet and adapted to be brought into contact with a frame of the same cabinet so as to close in an air-tight manner said storage compartment, and locking means adapted to hold the door in the closed position thereof.

[0003] Provided in particular in such refrigerated cabinets for professional use there are locking or closing means that are adapted to automatically cause the door to move against the frame surrounding the storage compartment, and lock the same door in a sealed, i.e. air-tight manner in the closed position thereof as soon as it comes into contact with such frame, e.g. by means of magnets properly arranged on the door itself and/or the frame.

[0004] In the periods during which a refrigerated cabinet is not used, i.e. not operative, there arises the need for the door thereof to be kept ajar in view of promoting proper aeration of the storage compartment and preventing in this way bad smells, moulds and/or bacteria from developing and growing.

[0005] Arrangements adapted to keep a refrigerator door ajar to favour aeration of the storage compartment during periods in which the refrigerator is not in use are already known in the art.

[0006] So, for instance, the US patent application No. 2004/0189015 discloses a lock arrangement for the door of a refrigerator, which comprises a striker unit connected to the cabinet of the refrigerator, and a first lock arm that is pivotally hinged on to the door so as to be able to rotate about a horizontal axis between a locking position and a release position. The first lock arm removably engages a first striking portion of said striker unit when said lock arm is in the locking position thereof. The arrangement further comprises a second lock arm that is pivotally connected to the door, so as to be able to rotate about a vertical axis between a locking position and a release position, so that the door is kept ajar, and the second lock arm removably engages a second striking portion of the striker unit member, when this second lock arm is in the locking position thereof.

[0007] Disclosed in US 4,930,818 is a combined lock arrangement for the door of a refrigerator, which comprises a door handle provided with a member adapted to be adjusted into two different positions thereof. In a first position thereof, the profile of such member coincides with the profile of the handle, i.e. is flush therewith, whereas, in a second position thereof, said member protrudes from the handle and engages the handle coupling catch provided on the cabinet of the refrigerator. Such member is made in a single-piece construction with an elastic protrusion engaging a groove of the handle.

[0008] The US patent No. 3,636,727 describes a refrigerated cabinet having a door hinged on to the cabinet and adapted to move into closing against the cabinet by engaging a mullion made of a magnetic material. Checking members formed of a magnet coated with plastic material are adapted to be applied onto said mullion to keep the door slightly open.

[0009] It is an object of the present invention to provide a refrigerated cabinet featuring an apparatus for keeping the door ajar that may be considered as being an advantageous alternative solution to prior-art arrangements of the same kind.

[0010] Within this general object, it is a purpose of the present invention to provide a refrigerated cabinet featuring an apparatus for keeping the door ajar that is simple in its construction, convenient in use and reliable to operate.

[0011] It is a further purpose of the present invention to provide a refrigerated cabinet featuring an apparatus for keeping the door ajar that is much more practical and convenient than similar prior-art arrangements.

[0012] According to the present invention, these aims, along with further ones that will become apparent from the following disclosure, are reached in a refrigerated cabinet incorporating the features and characteristics as recited in claims 1 et seq. appended hereto.

[0013] Further features and advantages of the present invention will be readily understood from the description of a preferred, although not sole embodiment that is given below by way of non-limiting example with reference to the accompanying drawings, in which:

- Figure 1 is a perspective view of a refrigerated cabinet provided with an apparatus for keeping the door ajar according to the present invention;
- Figure 2 is a perspective bottom view of the door according to the present invention of the refrigerated cabinet shown in Figure 1, as viewed with the arm in the operative position thereof;
- Figure 3 is a perspective top view of the door of the refrigerated cabinet according to the present invention, as viewed with the arm in the operative position thereof;
- Figure 4 is a perspective bottom view of the door of the refrigerated cabinet according to the present invention, as viewed with the arm in the non-operative position thereof;
- Figure 5 is a perspective view of the accommodating body, with the arm in the non-operative state thereof;
- Figure 6 is a top view of the accommodating body, with the arm in the non-operative state thereof;
- Figure 7 is a top view of the accommodating body,

with the arm in the operative state thereof;

- Figure 8 is a similar view as the one appearing in Figure 7, however with the elastic means in a compressed state to damp the movement that the arm is caused to undergo when engaging the frame.

[0014] With reference to the above-listed Figures, the refrigerated cabinet according to the present invention, as generally indicated at 1, comprises a compartment 2 intended for storing products to be preserved, a door 3 hinged on to the cabinet and adapted to move into contact with a frame 4 of said cabinet to close in an air-tight manner the storage compartment 2, lock means adapted to hold the door 3 in the closed position thereof, at least an apparatus 5 to keep the door 3 ajar so as to facilitate aeration of the storage compartment 2 during the periods in which the refrigerator is not in use.

[0015] The apparatus 5 comprises an arm 6 that is coupled in a movable manner to an accommodating structure 7, which is adapted to support the arm 6 in an operative position and in a non-operative position thereof, said structure 7 being associated to the door 3 or the frame 4, and said arm 6 being capable of being selectively guided into said operative position and said non-operative position thereof.

[0016] When in the operative position thereof, the arm 6 protrudes from the door 3, or the frame 4, so as to prevent the door 3 to come into contact with the abutting frame 4, thereby keeping the door 3 ajar, i.e. in a partially open state; when in the non-operative state thereof, the arm 6 is on the contrary contained in the accommodating structure 7, i.e. does not protrude, thereby enabling the door 3 to come into contact with said frame 4 and close the storage compartment in an air-tight manner.

[0017] In a preferred embodiment, the accommodating structure 7 is associated to a lower edge 8 of the door 3 in the proximity of an inner wall 9 of the same door.

[0018] The accommodating structure 7 comprises a support member 10, on which there is provided a pin 11 adapted to rotatably engage the arm 6.

[0019] A correspondingly shaped edging 12 extends from the support member 10 to support the arm 6 in the operative position and the non-operative position thereof. The arm 6 is capable of rotating, in a direction parallel to said support member 10, about the pin 11 between said operative position and said non-operative position thereof, said positions being situated at an angle of 180° from each other. In the rotating motion thereof, the arm 6 describes substantially a semicircle extending perpendicularly from the inner wall 9 of the door 3.

[0020] The arm 6 comprises a first end portion 13 adapted to engage the pin 11 and a second free end portion 14 comprising a stop portion 15 and an abutment portion 16, which extend on respective opposite sides relative to said second free end portion 14.

[0021] The shaped edging 12 has such a conformation as to enable the accommodating body 7 to define a first accommodation 17 adapted to receive the stop portion 15, and a second accommodation 18 adapted to engage the abutment portion 16.

[0022] The arm 6 is capable of being rotated manually by a user about the pin 11, so as to be selectively guided into the operative position and the non-operative position thereof.

[0023] When in the non-operative position (Figures 4, 5, 6), the stop portion 15 of the arm 6 is contained within the first accommodation 17, so that the arm 6 does not protrude from the inner wall 9 of the door 3, thereby enabling the door to move into closing the storage compartment in an air-tight manner.

[0024] When in the operative position (Figures 1, 2, 3, 7, 8), in which the arm 6 is rotated by 180° relative to the non-operative position thereof, the second accommodation 18 of the accommodating structure 7 engages the abutment portion 16 of the arm 6, so that the stop portion 15 is caused to protrude from the inner wall 9 of the door 3. When the door 3 is brought against the frame 4, the stop portion 15 is therefore adapted to abut first against the frame 4 of the storage compartment 2, thereby preventing the door 3 from closing and keeping the same door 3 ajar.

[0025] In an advantageous manner, in correspondence to said second accommodation 18 of the accommodating body 7 there are provided elastic means 19 adapted to engage the abutment portion 16 of the arm 6 when the latter is brought into the operative position thereof (Figure 7), so as to damp the movement that the arm 6 is caused to undergo when, by the door 3 being brought against the frame 4, the stop portion 15 comes to abut against the frame 4. Figure 8 shows the elastic means 19 in a compressed state thereof for damping the movement which the arm is caused to undergo when abutting against the frame.

[0026] The elastic means 19 comprise a helical spring, which has a first end portion thereof engaging the shaped edging 12, and a second free end portion thereof adapted to engage a recess provided in the abutment portion 15 of the arm.

[0027] The accommodating structure 7 is capable of being associated to the lower edge 8 of the door 3 of the refrigerated cabinet by means of screws engaging properly provided through-holes in the shaped edging 12.

[0028] The apparatus according to the present invention is particularly suitable for use in connection with refrigerated cabinets, in which there are provided closing means that cause the door 3 to automatically move against the frame 4 of the storage compartment 2 and shut the door 3 in an air-tight manner thereagainst, when said door comes close to such frame 4, e.g. by means of magnets provided on the door and/or the frame.

[0029] The apparatus according to the present invention may of course be attached to the door even on a side edge thereof, or a top edge thereof, as this may prove most suitable in view of particular needs.

[0030] Those skilled in the art will be able to readily

appreciate that, within this same innovative concept, the accommodating structure 7 may be alternatively attached to the frame 4 or be even provided integrally in the door 3 or the frame 4.

[0031] Fully apparent from the above description is therefore the ability of the apparatus according to the present invention to effectively reach the aims and advantages cited afore, through the provision of a refrigerated cabinet with an apparatus for positively keeping the door ajar, which is simple in its construction, convenient to use and reliable in operation.

[0032] It shall be appreciated that the refrigerated cabinet as described above may be subject to a number of modifications and be embodied in a number of different manners without departing from the scope of the present invention. Furthermore, all details thereof, as described above, may be replaced by technically equivalent elements and means.

[0033] It shall further be appreciated that the materials used, as well as the shape and the sizing of the various parts, may each time be selected so as to more appropriately meet the particular requirements or suit the particular application.

Claims

1. Refrigerated cabinet comprising a compartment (2) for the storage of products to be preserved, a door (3) hinged on to the cabinet and adapted to move into contact with a frame (4) of said cabinet to close in an air-tight manner the storage compartment (2), retaining means adapted to hold the door (3) in the closed position thereof, and at least an apparatus (5) to keep the door (3) ajar so as to facilitate aeration of the storage compartment (2) during the periods in which the refrigerator is not in use, **characterized in that** said apparatus (5) comprises an arm (6) that is coupled in a movable manner to an accommodating structure (7), which is adapted to support the arm (6) in an operative position and in a non-operative position thereof, said structure (7) being associated to said door (3) or said frame (4), and said arm (6) being capable of being selectively guided into said operative position and said non-operative position thereof, in said operative position thereof said arm (6) protruding from said door (3), or said frame (4), so as to abut against said door (3) or said frame (4) of the storage compartment (2), thereby preventing the door (3) from coming into contact with the abutting frame so as to keep the door (3) ajar, in the non-operative state thereof said arm (6) being on the contrary fully contained within said accommodating structure (7), thereby enabling the door (3) to fully move into closing the storage compartment in an air-tight manner.

2. Refrigerated cabinet according to claim 1, **characterized in that** said accommodating structure (7) comprises a pin (11) adapted to rotatably engage the arm (6), said arm (6) being capable of rotating about the pin (11) between said operative position and said non-operative position thereof.

3. Refrigerated cabinet according to claim 1 or 2, **characterized in that** said arm (6) comprises a first end portion (13) adapted to engage the pin (11) and a second free end portion (14) comprising a stop portion (15) and an abutment portion (16).

4. Refrigerated cabinet according to any of the preceding claims or a combination thereof, **characterized in that** said accommodating body (7) defines a first accommodation (17) adapted to receive the stop portion (15), and a second accommodation (18) adapted to engage the abutment portion (16).

5. Refrigerated cabinet according to any of the preceding claims or a combination thereof, **characterized in that**, in said operative position, the second accommodation (18) of the accommodating structure (7) engages the abutment portion (16) of the arm (6), so that the stop portion (15) is caused to protrude from the frame (4) or an inner wall (9) of the door (3), said stop portion (15) being in this way adapted to abut first against the door (3) or the frame (4) of the storage compartment (2), thereby preventing the door (3) from closing completely and keeping the same door (3) ajar.

6. Refrigerated cabinet according to any of the preceding claims or a combination thereof, **characterized in that**, in said non-operative position, said stop portion (15) of the arm (6) is contained within the first accommodation (17), so that the arm (6) does not protrude from the frame (4) or the inner wall (9) of the door (3), thereby enabling the door (3) to move into closing the storage compartment in an air-tight manner.

7. Refrigerated cabinet according to any of the preceding claims or a combination thereof, **characterized in that** in correspondence to said second accommodation (128) of the accommodating body (7) there are provided elastic means (19) adapted to engage the abutment portion (16) of the arm (6), when said arm (6) is brought into the operative position thereof, so as to damp the arm (6) when abutting against the frame (4) or the door (3).

8. Refrigerated cabinet according to any of the preceding claims or a combination thereof, **characterized in that** said accommodating structure (7) is provided at a lower edge (8) of the door (3).

9. Refrigerated cabinet according to any of the preced-

ing claims or a combination thereof, **characterized in that** said arm (6) is capable of being rotated manually by a user about the pin (11), so as to be selectively guided into the operative position and the non-operative position thereof.

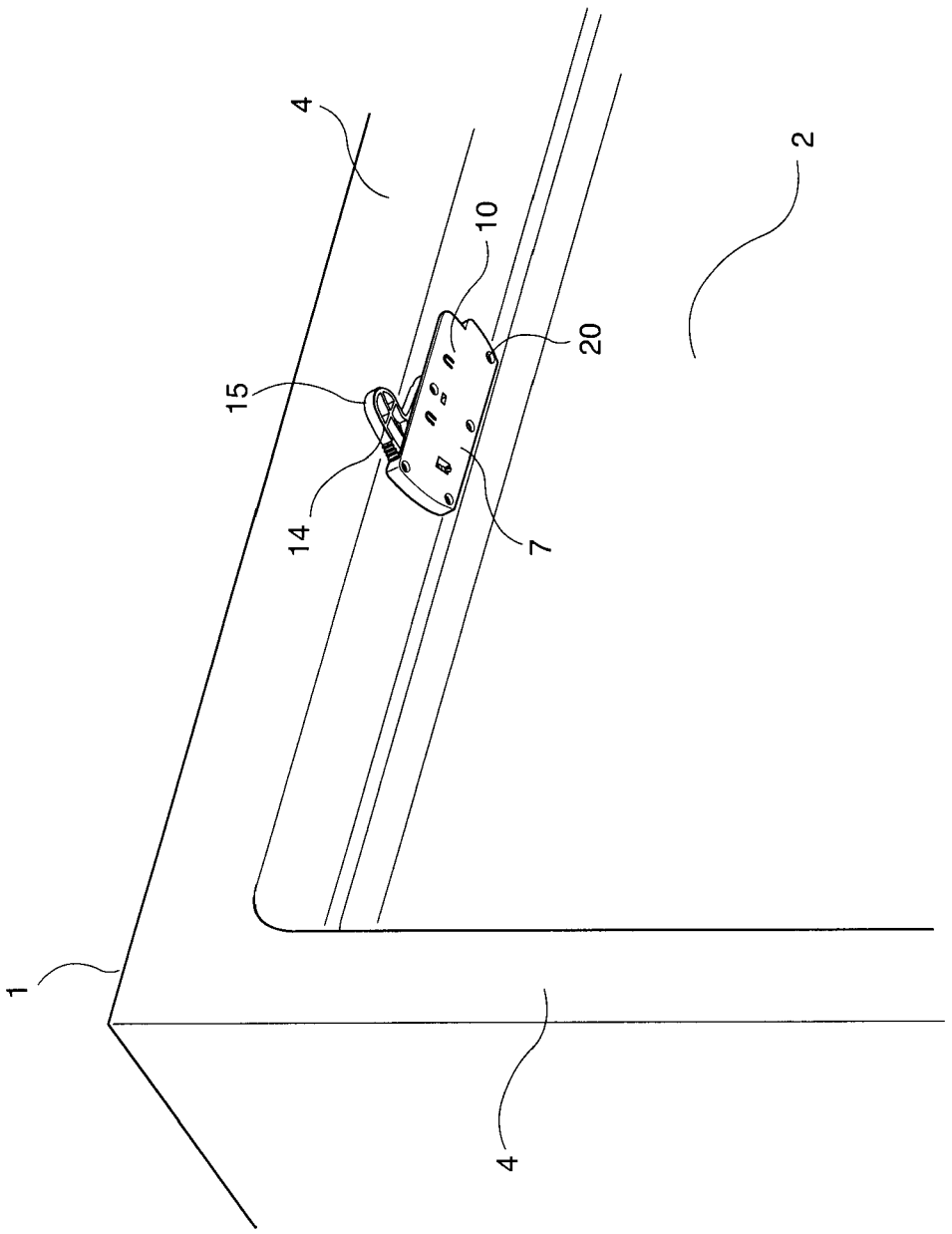

fig.1

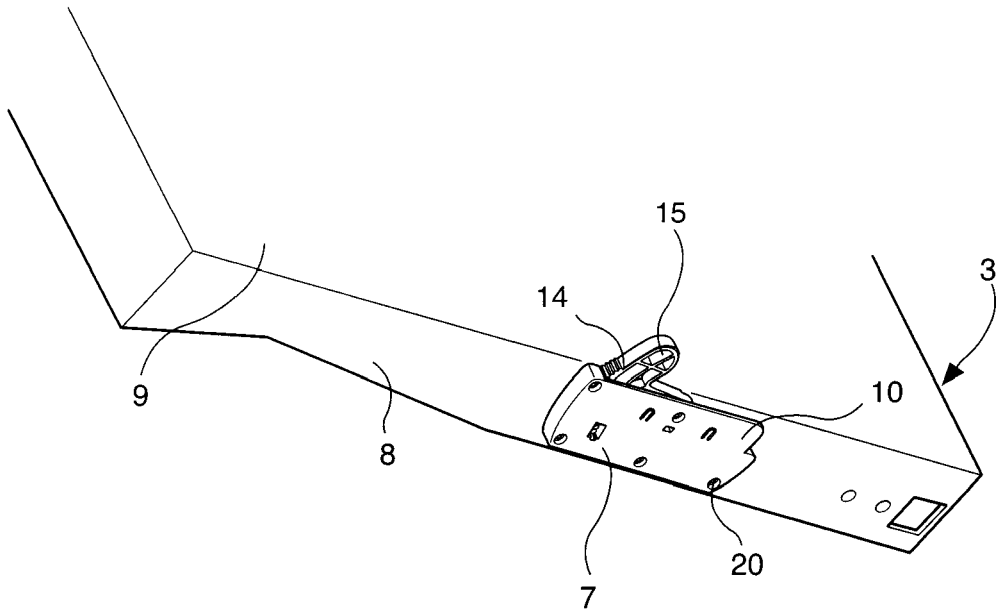

fig.2

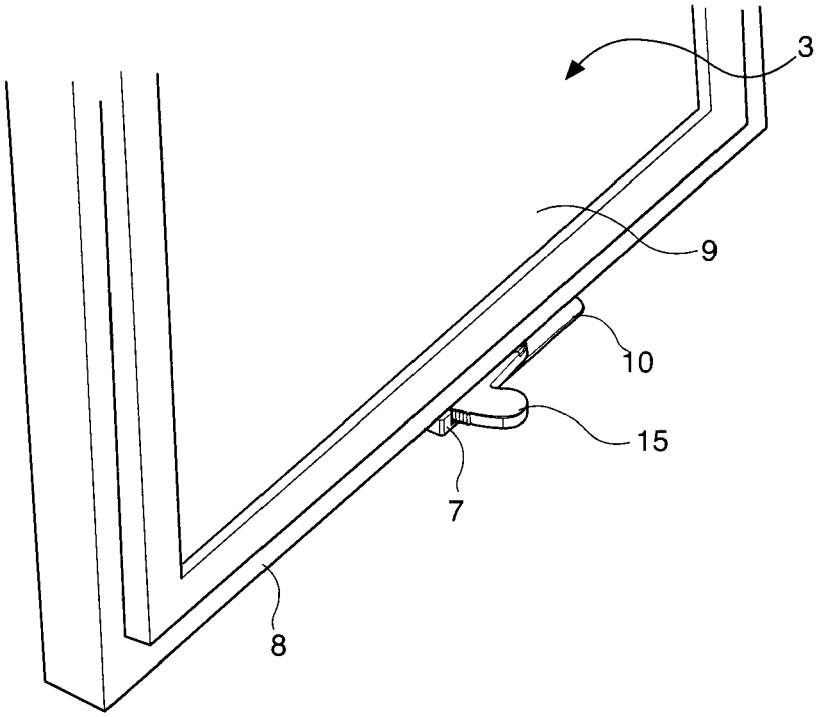

Fig. 3

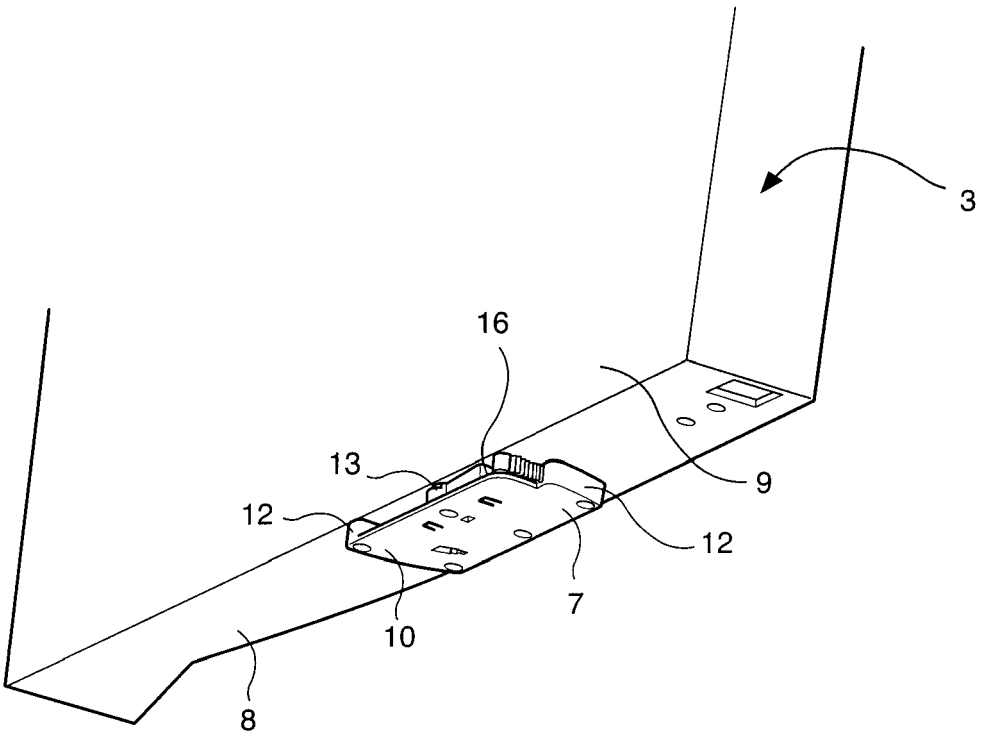

Fig. 4

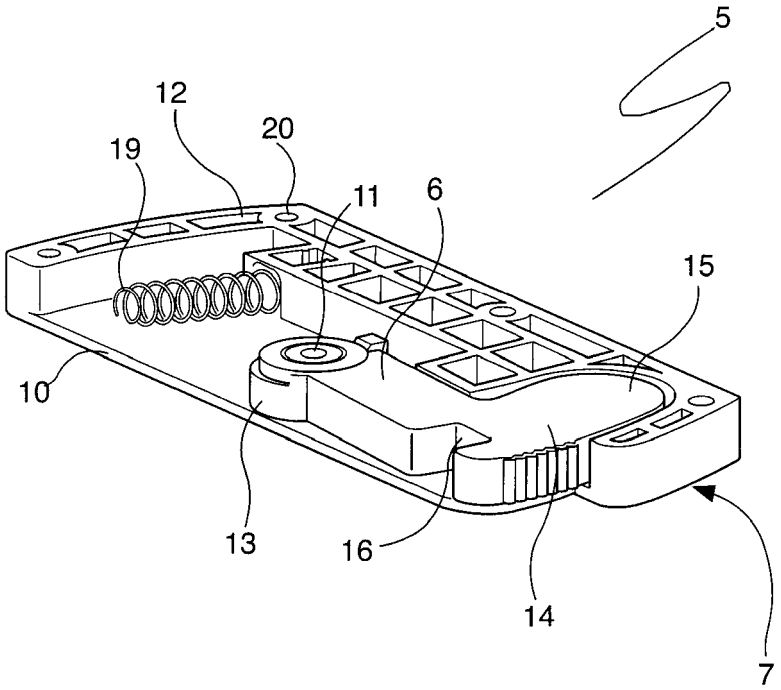

fig.5

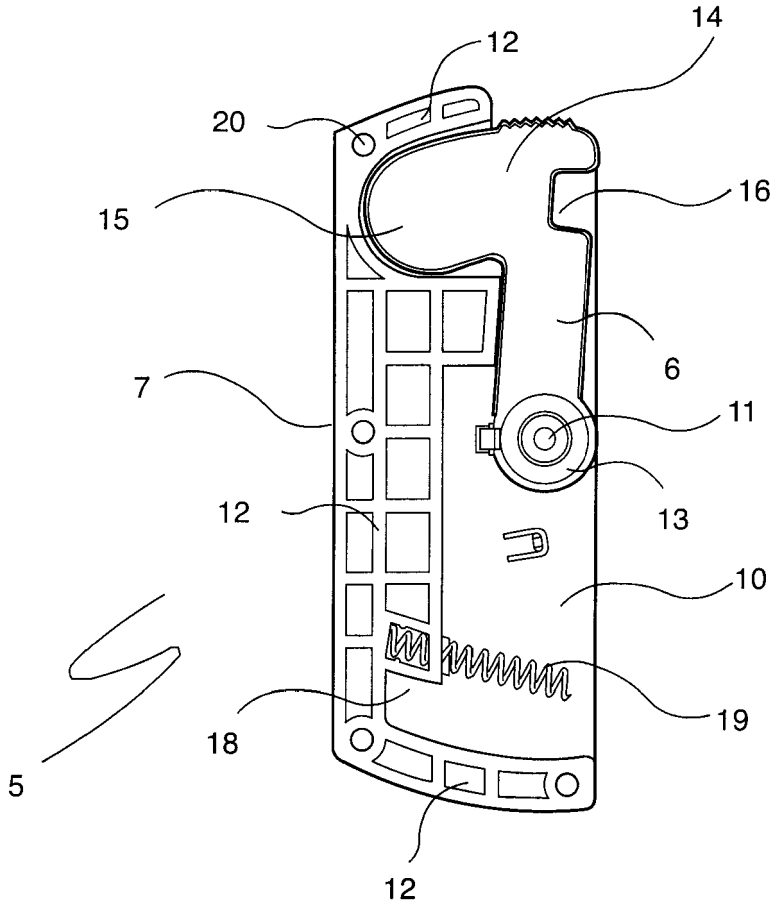

fig. 6

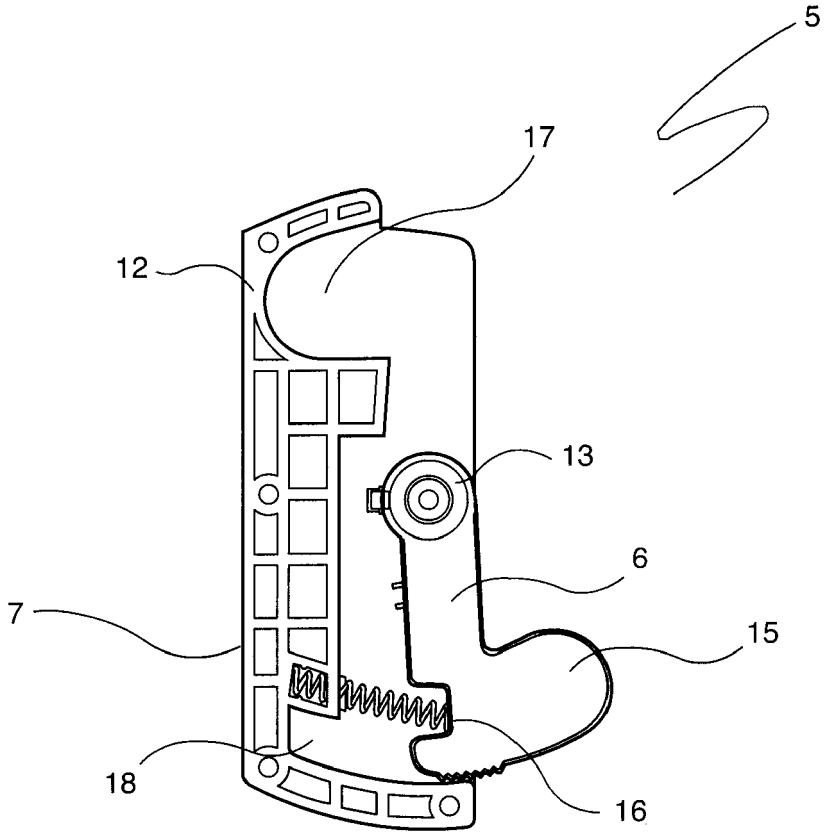

fig. 7

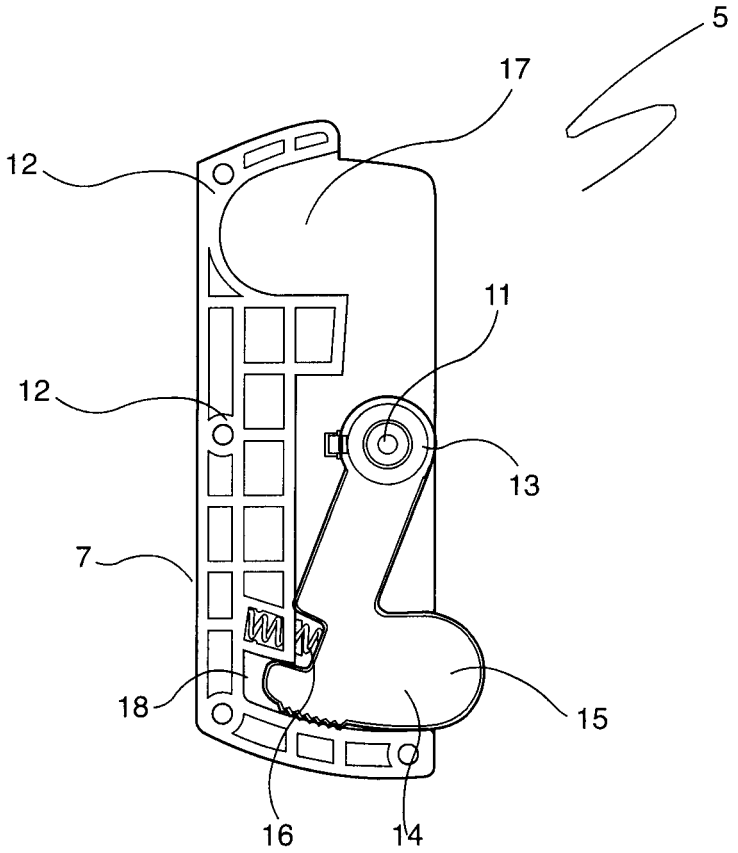

fig. 8