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(54) Actuation assembly for moving doors or windows

(57) An actuation assembly for moving glazed doors or windows, of the type comprising an enclosure (11, 111, 211, 311, 411) for containing the electromechanical components for actuation (13, 113, 213, 313, 413) and the electronic components for management and control. The actuation assembly further comprises a roller-type awning device (22, 122, 222, 322, 422), which in turn comprises a roller (23, 123, 223, 323, 423) for rolling up/unrolling the awning (24, 124, 224, 324, 424), means (25) for actuating the rotation of the roller (23, 123, 223, 323, 423), unwinding/winding means (27) for at least one cable (28, 128) for keeping the awning (22, 122, 222, 322, 422) under tension during its movement. The roller (23, 123, 223, 323, 423) for rolling up/unrolling the awning and the unwinding/winding means (27) for the at least one cable (28, 128) are arranged in mutually opposite positions, with respect to the area to be covered, which are formed on the leaf (B) or casing frame (T) or on both (B, T). The roller (23, 123, 223, 323, 423) or the unwinding/winding means (27) are rigidly coupled to a preset position of the enclosure (11, 111, 211, 311, 411).

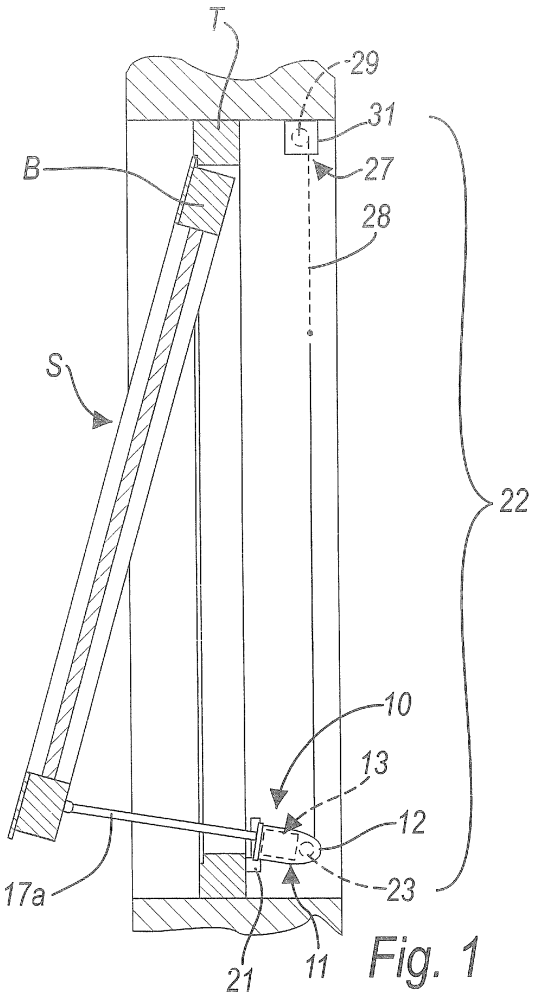

Fig. 1

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Description

[0001] The present invention relates to an actuation assembly for moving doors or windows.

[0002] The invention is particularly suitable for doors or windows of the glazed type or the like.

[0003] As is known, awnings are usually applied at the glazed leaves of doors or windows (windows, French doors, et cetera) in order to protect against the light that comes in from outside or in order to adjust such light.

[0004] This application, which is performed in various manners and in different forms, is an operation which has to be performed individually and is often laborious and specialized.

[0005] When movement actuators are associated with such doors or windows and allow motorized opening and closure thereof, application of the awnings is made awkward by their presence.

[0006] Among the various constructive types of movement actuator to be associated with glazed and non-glazed doors or windows, the most widely used ones are chain-operated ones and comprise substantially a containment box which accommodates motor means, normally constituted by an electric motor, which is connected to a reduction unit, which in turn is coupled by means of one of its sprockets to a guided chain which protrudes with a working end from the containment box and is connected to the leaf, if the box is fixed to the casing frame, or to said casing frame, if the box is fixed to the leaf.

[0007] In the case of a box fixed to the leaf, application of the awning is particularly awkward due to the interference offered thereby.

[0008] This awkwardness is increased by the awkward position in which the windows with which awnings are to be associated are located.

[0009] For example, windows arranged in lofts or skylights may be difficult to reach for an installation technician; the presence of an actuator for moving the window, in addition to the difficulty in reaching the window and working in unstable conditions, cause the installation of the awning to be problematic.

[0010] Other difficulties are added when it is necessary to install so-called "motorized" awnings, for example of the roller type, which require electrical connections for their operation; the passage of these cables, in addition to the difficulties described above, makes installation even more difficult.

[0011] The aim of the present invention is to solve the problems observed in installing awnings on windows or French doors which can be moved by means of electromechanical actuators.

[0012] Within this aim, an object of the present invention is to provide an actuation assembly for moving doors or windows which allows to facilitate the installation of an awning on the door or window with which the actuator is associated.

[0013] Another object of the present invention is to provide an actuation assembly for moving doors or windows which allows easy adjustment of the opening and closure of the door or window and of an awning associated with such door or window.

[0014] Another object of the present invention is to provide an actuation assembly for moving doors or windows which is simple to install and easy to use.

[0015] This aim and these and other objects, which will become better apparent hereinafter, are achieved by an actuation assembly for moving doors or windows, of the type which comprises an enclosure for containing the electromechanical components for actuation and the electronic components for management and control, characterized in that it comprises a roller-type awning device which in turn comprises

- a roller for rolling up/unrolling the awning,
- means for actuating the rotation of said roller,
- unwinding/winding means for at least one cable for keeping the awning under tension during its movement,

said roller for rolling up/unrolling the awning and said unwinding/winding means for at least one cable being arranged in mutually opposite positions, with respect to the glazed area to be covered, which are formed on the leaf or casing frame or on both, said roller or said means being rigidly coupled to a preset position of said enclosure.

[0016] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a schematic sectional side view of a window of the type with horizontal hinges and outward opening, with an actuation assembly according to the invention applied to the casing frame;

Figure 2 is a partially sectional schematic side view of an actuation assembly which is not applied to any window and has the same configuration for use as the actuation assembly of Figure 1;

Figure 3 is a top view of part of the actuation assembly of the preceding figures, not applied to any door or window;

Figure 4 is a partially sectional schematic side view of an actuation assembly which is not applied to any window and has a configuration for use which is different from the one of the actuation assembly of Figure 1;

Figure 5 is a schematic sectional side view of a window of the type with horizontal hinges and inward opening, with an actuation assembly according to the invention applied thereto, shown in the same configuration as the assembly of Figure 1 but installed on the leaf of the window and not on the casing frame;

Figure 6 is a schematic sectional side view of a por-

tion of a window, showing part of an actuation assembly according to a different embodiment with respect to the preceding figure;

Figure 7 is a partially sectional schematic side view of part of the actuation assembly, not applied to any window, which has a structure according to a further embodiment, different from the actuation assembly of the preceding figures;

Figure 8 is a partially sectional schematic side view of part of the actuation assembly, not applied to any window, which has a structure according to a different embodiment with respect to the structure of the actuation assembly of the preceding figures.

[0017] It is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0018] With reference to the figures, an actuation assembly for moving glazed doors or windows, according to the invention, is generally designated by the reference numeral 10.

[0019] The actuation assembly 10 is for example associated with a door or window S, which is composed of a casing T and a leaf B which is pivoted on its upper side so as to open outward.

[0020] As clearly shown in Figures 2 and 3, the actuation assembly 10 is constituted by an enclosure 11 for containing the electromechanical actuation components and the electronic components for management and control, such as an electronic board, which is not shown in the figures.

[0021] In this embodiment, the outer enclosure 11 is constituted by a box-like body 12, for example an extruded element (for example made of aluminum) with an open transverse profile, inside which there are two similar actuators 13 which are aligned at a preset distance and are of the single-chain type (shown, not in cross-section, in Figure 2), each actuator having the outer working end 14 of the respective chain preset to pass through the open portion 15 of the transverse profile of the extruded box-like body 12.

[0022] The outer enclosure 11 has a supporting and covering function for the actuators 13, which are substantially identical and of a known type.

[0023] In practice, the actuators 13 are already-complete actuators, which can be installed independently of the outer enclosure, according to a structure of a known type. For example, each of the actuators 13 is constituted by a containment box 17, inside which there are motor means (not shown in the figures) which are connected to a reduction unit, which in turn is coupled, by means of a sprocket which meshes with a guided chain (shown schematically by means of a continuous element designated by the reference numeral 17a) which has an outer working end 14 preset so as to pass through a corresponding opening formed in the containment box (not shown in the figures).

[0024] At the two end portions 18 of the extruded box-like body 12 there are two complementarily shaped closure plugs 19, which also are associated by insertion and locked on the extruded box-like body 12 by means of screws (not shown in the figures).

[0025] One of the two closure plugs 19 has a grommet (not shown in the figures) to allow the exit of the power supply and actuation wiring of the actuators 13.

[0026] Means for covering the open portion 15 of the transverse profile of the extruded box-like body 12 are associated with the extruded box-like body 12, such as for example plates made of plastic material (not shown in the figures) which are fixed to the internal portions of the edges of the open portion 15, particularly inserted in mutually opposite slots 20 formed in said edges.

[0027] The outer enclosure 10 is provided with means for fixing to the door or window (in this case, to the casing T), such as for example a pair of brackets 21.

[0028] According to the invention, the actuation assembly 10 comprises a roller-type awning device 22, which in turn comprises a roller 23 for rolling up/unrolling an awning 24.

[0029] Rotation actuation means 25, such as an electric motor 26, are associated with the roller 23.

[0030] Further, the roller-type awning device 22 comprises unwinding/winding means 27 for a cable 28 for keeping the awning 24 under tension during its movement, such means being constituted for example by a winding pulley 29, to which elastic means 30 for contrasting the unwinding of the cable 28, such as a torsion spring, are connected.

[0031] The cable 28 is fixed to the free end edge of the awning 24, for example by means of a hook.

[0032] The roller 23 for rolling up/unrolling the awning 24 and the unwinding/winding means 27 for the cable 28 are arranged in mutually opposite positions, with respect to the glazed area to be covered, which are formed on the glazed leaf B or on the frame of the casing T or on both, as described hereinafter.

[0033] In a first configuration, the roller 23 with the motor 26 is in fact accommodated inside the enclosure 11, particularly inside the same compartment 12a of the extruded box-like body 12 that accommodates the actuators 13 (Figures 1, 2, 3, 4, 5).

[0034] A longitudinal slit 11a is provided along the enclosure 11 and allows the awning 24 to exit.

[0035] The pulley 29 is instead pivoted, by means of a respective bracket element 31, to the frame T of the casing (or equivalently to the wall to which said frame T is rigidly coupled), in an opposite position with respect to the enclosure 11 relative to the glazed area to be covered with the awning.

[0036] In this configuration, the wiring of the electric motor is internal to the enclosure 11 and indeed can be connected to the electronic board which controls the actuators, thus forming a single actuation assembly with an integrated awning which is controlled for example by means of a single control associated with the electronic board, for example by means of a remote control or radio

control or, as an alternative, by means of the addition of wired controls (which in this case are different for the motor and the awning).

[0037] With this configuration, the roller-type awning device 22 in practice is rigidly coupled to the frame T of the casing.

[0038] Figure 4 illustrates a configuration of a roller-type awning device, designated by the reference numeral 122, in which the roller 123 for rolling up/unrolling the awning 124 with the motor 126 is rigidly coupled, by way of the bracket body 131, to the frame T of the casing (or equivalently to the wall to which the frame T is rigidly coupled), while the pulley 109 is accommodated inside the enclosure 111, particularly inside the same compartment of the extruded box-like body 112 that accommodates the actuators 113 (the cable 128 exits from the enclosure 111 by means of a longitudinal through slot 111a).

[0039] Figure 5 illustrates a different configuration for the application of the roller-type awning device, now designated by the reference numeral 222, which is applied to a window with vasistas-type inward opening.

[0040] In this configuration, both the enclosure 211 and the pulley 229 are rigidly coupled to the leaf B of the window, at opposite sides thereof with respect to the glazed area to be shielded with the awning 224.

[0041] In particular, the enclosure 211 is fixed by means of the brackets 221 to the upper part of the leaf B, while the pulley is rigidly coupled thereto by way of the bracket element 231.

[0042] Figure 6 illustrates a different embodiment of the coupling of the pulley, now designated by the reference numeral 229'; in this example, the pulley 229' is rigidly coupled, by means of the bracket element 231', to the frame T of the casing (or equivalently to the wall to which the frame T is rigidly coupled).

[0043] Figure 7 illustrates a different embodiment of the roller-type awning device, now designated by the reference numeral 322.

[0044] In particular, an enclosure 311 is shown which is constituted by an extruded box-like body 312 which forms two distinct longitudinal compartments which run parallel to each other, respectively a first compartment 312a for accommodating the actuators 313 on which the open portion 315 for the exit of the chain of said actuator is formed, and a second compartment 312b, which accommodates the roller 323 for rolling up/unrolling the awning 324; the longitudinal through slit 311a is formed in the second compartment 312b.

[0045] The second compartment 312b is suitable to accommodate the pulley for winding/unwinding the cable for keeping the awning under tension, instead of the roller 323, when the configuration provides the roller 323 on the opposite side of the casing.

[0046] Figure 8 illustrates another embodiment of the roller-type awning device, designated by the reference numeral 422.

[0047] In this embodiment, the enclosure 411 is constituted by two distinct bodies: a first box-like body 412, which in this embodiment is extruded and forms a first compartment 412a which accommodates the actuators 413; and a second box-like body 433, which in this embodiment is extruded and constitutes a second compartment 433a for accommodating the roller 423 for rolling up/unrolling the awning 424; the second box-like body 433 is provided with a longitudinal through slit 411 a for the exit of the awning.

[0048] In this case also, the second compartment 412b is suitable to accommodate the pulley for winding/unwinding the cable for keeping the awning under tension instead of the roller 423 when the configuration provides the roller 423 on the opposite side of the door or window.

[0049] The second box-like body 433 is fixed by way of fixing means 434 to the first box-like body 412.

[0050] In this embodiment, the fixing means 434 correspond to an insertion coupling of contoured portions 435 of the sides of the second box-like body 433 on corresponding complementary C-shaped portions 436 formed on a face of the first box-like body 412.

[0051] It is evident that in an equivalent manner, the second compartment 433a can accommodate the pulley for winding/unwinding the cable for keeping the awning under tension instead of the roller 423.

[0052] It is evident that the means for actuating the rotation of the awning roll-up/unrolling roller can also be of a manual type, such as for example normal controls using a flexible cable, rod or belt which are typical of non-motorized roller-type awning devices.

[0053] In practice it has been found that the invention thus described achieves the intended aim and objects.

[0054] The present invention in fact provides an actuation assembly with which a roller-type awning device is integrated.

[0055] This integration allows to perform simultaneously both the installation of the movement actuators and of the roller-type awning device, thus avoiding the secondary installation of the latter, with all the practical problems noted in the introduction.

[0056] Further, by arranging the roll-up/unrolling roller with the corresponding motor inside the enclosure that contains the actuators and by providing ordinary electrical connections, the wiring step is simplified considerably (in practice, a single wiring is achieved instead of two separate wirings).

[0057] The particular structure of the enclosure formed by an extruded box-like body which contains the actuators and the awning roll-up roller (or the pulley with the tensioning cable) allows particular flexibility in choosing the dimensions of the actuation assembly, since it allows to prepare an enclosure of the exact size with respect to the door or window to be obtained with the number of actuators required to bear the weight of the door or window and to associate, if necessary, the roller-type awning device.

[0058] The invention thus conceived is susceptible of numerous modifications and variations, all of which are

within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

[0059] In practice, the materials employed, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

[0060] The disclosures in Italian Patent Application No. PD2007A000028 from which this application claims priority are incorporated herein by reference.

[0061] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. An actuation assembly for moving doors or windows, of the type comprising an enclosure (11, 111, 211, 311, 411) for containing the electromechanical components for actuation (13, 113, 213, 313, 413) and the electronic components for management and control, **characterized in that** it comprises a roller-type awning device (22, 122, 222, 322, 422), which in turn comprises

   - a roller (23, 123, 223, 323, 423) for rolling up/unrolling the awning (24, 124, 224, 324, 424),
   - means (25) for actuating the rotation of said roller (23, 123, 223, 323, 423),
   - unwinding/winding means (27) for at least one cable (28, 128) for keeping the awning (24, 124, 224, 324, 424) under tension during its movement,

   said roller (23, 123, 223, 323, 423) for rolling up/unrolling the awning and said unwinding/winding means (27) for said at least one cable (28, 128) being arranged in mutually opposite positions, with respect to the area to be covered, which are formed on the leaf (B) or casing frame (T) or on both (B, T), said roller (23, 123, 223, 323, 423) or said unwinding/winding means (27) being rigidly coupled to a preset position of said enclosure (11, 111, 211, 311, 411).

2. The actuation assembly for moving doors or windows according to the preceding claim, **characterized in that** said outer enclosure (11, 111, 211, 311, 411) is constituted by at least one box-like body (12, 112, 212, 312, 412, 433) with an open transverse profile, inside which there is at least one actuator (13, 113, 213, 313, 413) of the chain type in which the outer working end (14) of the respective chain (17a) is preset to pass through the open portion (15) of the transverse profile of said box-like body (12, 112, 212, 312, 412, 433), electronic components for management and control being provided inside said outer enclosure (11, 111, 211, 311).

3. The actuation assembly for moving doors or windows according to claim 2, **characterized in that** said roller (23, 123) with the corresponding actuation means (25) or said unwinding/winding means (27) for at least one cable (28, 128) for keeping the awning (24, 124) under tension are accommodated inside the same compartment (12a, 112a) of the box-like body (12, 112) in which said at least one actuator (13, 113) is accommodated, said box-like body (12, 112) having a longitudinal slit or hole (11 a, 111a) which allows the exit of the awning (24) or of said cable (28, 128).

4. The actuation assembly for moving doors or windows according to claim 2, **characterized in that** said box-like body (312) forms two distinct compartments which are arranged parallel to each other, a first compartment (312a) for accommodating said at least one actuator (313) and a second compartment (312b) for accommodating said roller (323) with the corresponding actuation means (325) or said unwinding/winding means (127) for at least one cable (128) for keeping the awning (324) under tension, said box-like body (312) having a longitudinal slit (311a) or hole which allows the exit of the awning (324) or of said cable (128).

5. The actuation assembly for moving doors or windows according to claim 2, **characterized in that** said enclosure is constituted by two distinct box-like bodies (412, 433), a first box-like body (412), which forms a first compartment (412a) which accommodates said actuator (413), and a second box-like body (433), which forms a second compartment (433a) for accommodating said roller (423) with the corresponding actuation means (425) or said unwinding/winding means (127) for at least one cable (128) for keeping the awning (424) under tension, said second body (433) having a longitudinal slot (411 a) or hole which allows the exit of the awning (424) or of said cable (128), said second box-like body (433) being fixed by way of fixing means (434) to said first box-like body (412).

6. The actuation assembly for moving doors or windows according to claim 5, **characterized in that** said fixing means (434) correspond to a coupling by insertion of contoured portions (435) of the sides of said second box-like body (433) on corresponding complementarily shaped portions (436) formed on a face of said first box-like body (412).

7. The actuation assembly for moving doors or win-

dows according to one or more of the preceding claims, **characterized in that** said unwinding/winding means (27) for at least one cable (28, 128) for keeping the awning (24, 124, 224, 324, 424) under tension during its movement comprise at least one pulley (29, 129, 229) for a respective said cable (28, 128) with which elastic means (30) for contrasting the unwinding of said cable (28, 128) are associated.

8. The actuation assembly for moving doors or windows according to claim 7, **characterized in that**, when said roller (23) is accommodated in said enclosure (11), said at least one pulley (29) is pivoted, by means of a respective bracket element (31), to the frame (T) of the casing or to the leaf (B), in the opposite position with respect to said enclosure (11) relative to the glazed area to be covered with the awning (24).

9. The actuation assembly for moving doors or windows according to one or more of the preceding claims, **characterized in that** said means (25) for actuating the rotation of said roller (23) are constituted by an electric motor.

10. The actuation assembly for moving doors or windows according to one or more of the preceding claims, **characterized in that** said at least one box-like body (12, 112, 212, 312, 412, 433) is an extruded element.

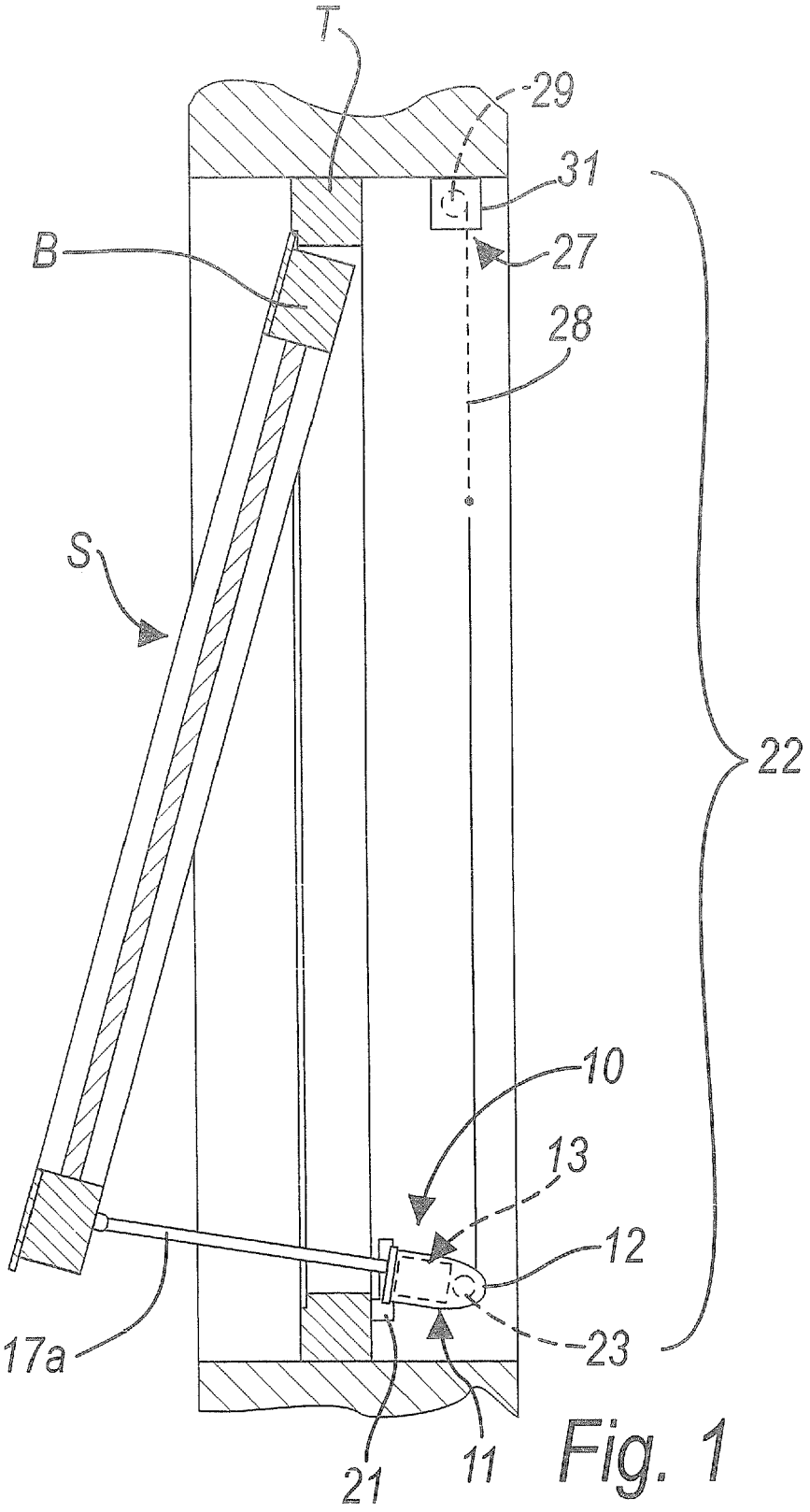

Fig. 1

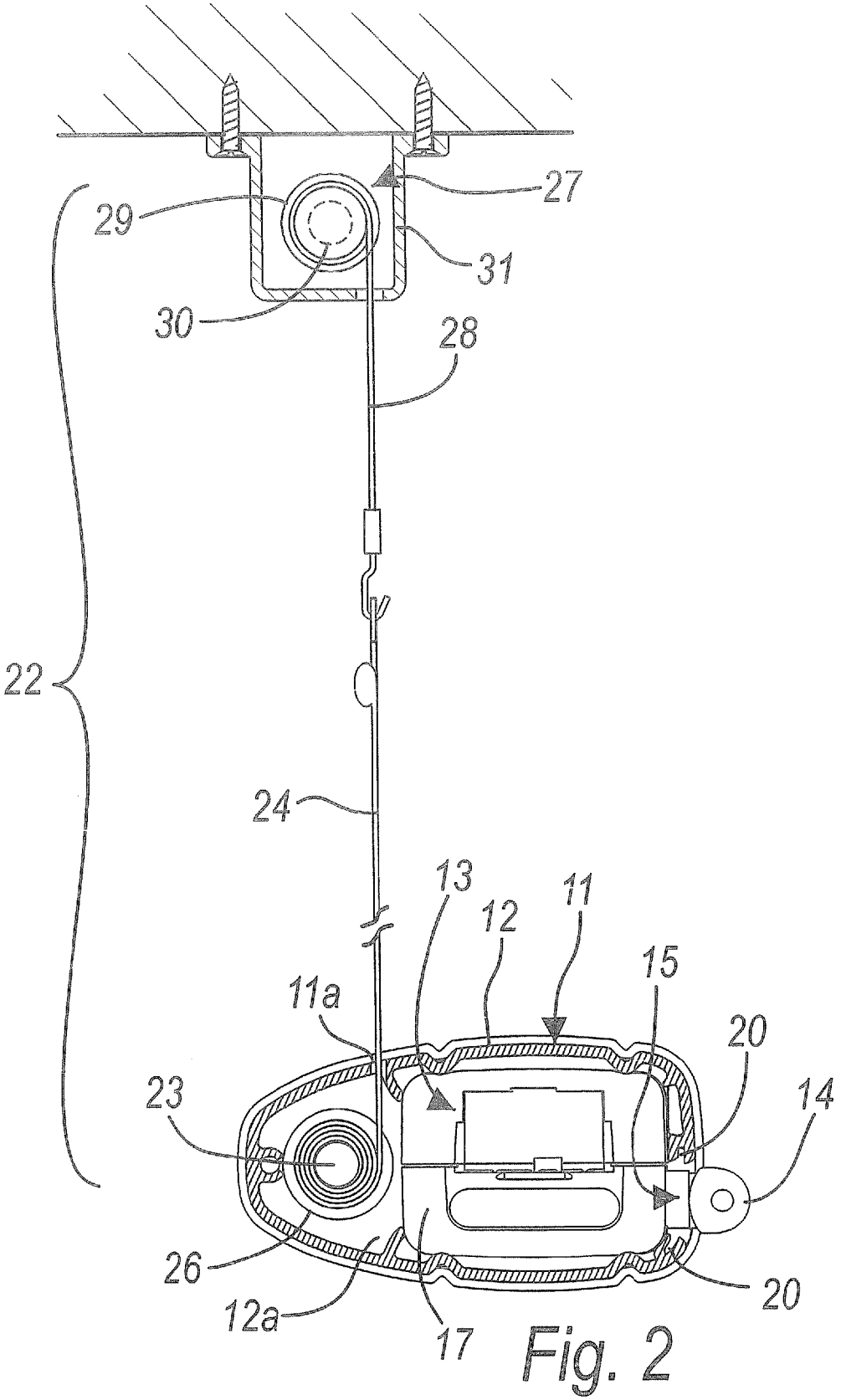

Fig. 2

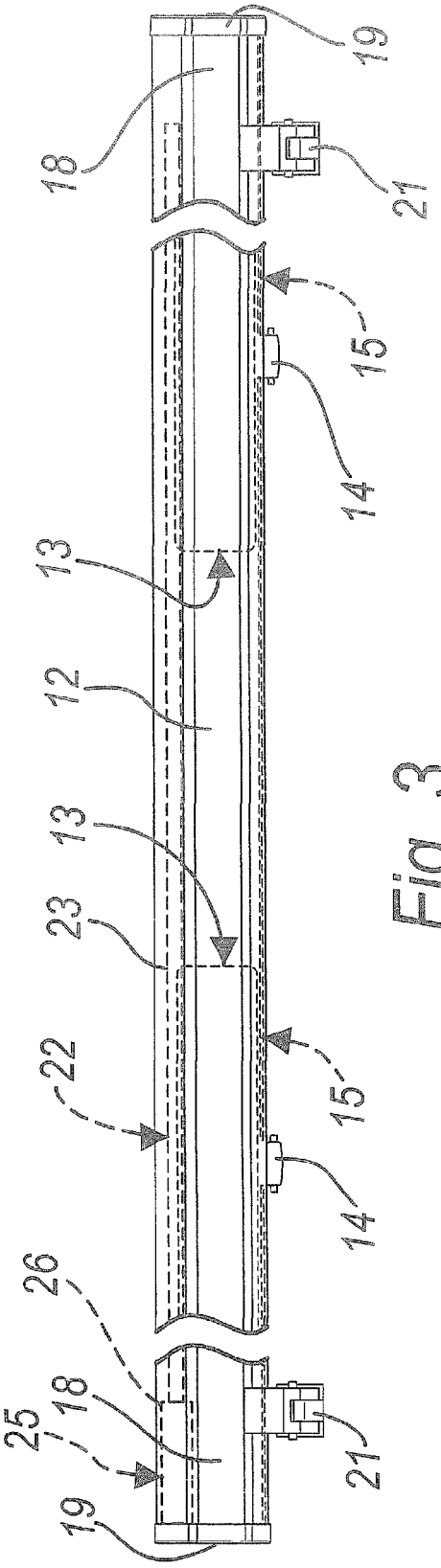

Fig. 3

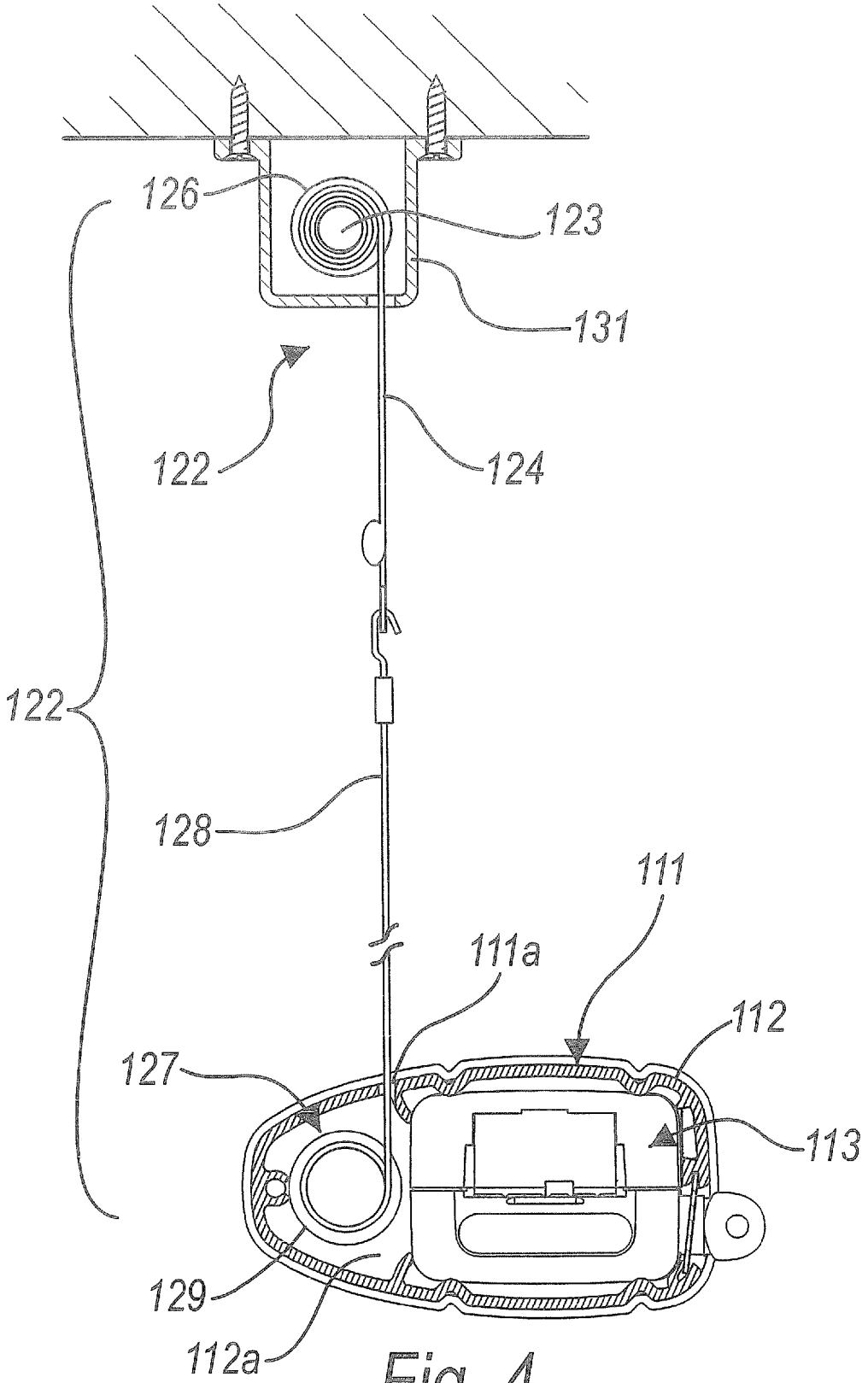

Fig. 4

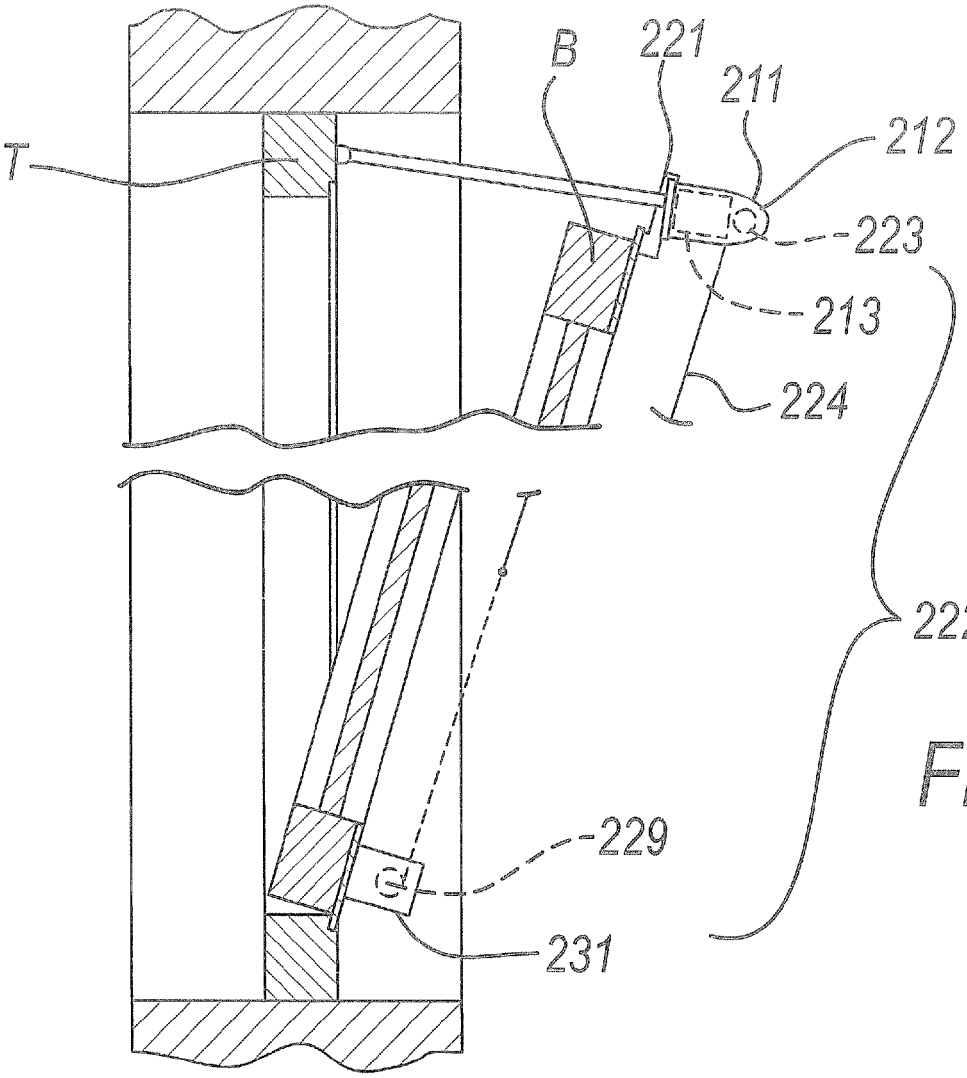

Fig. 5

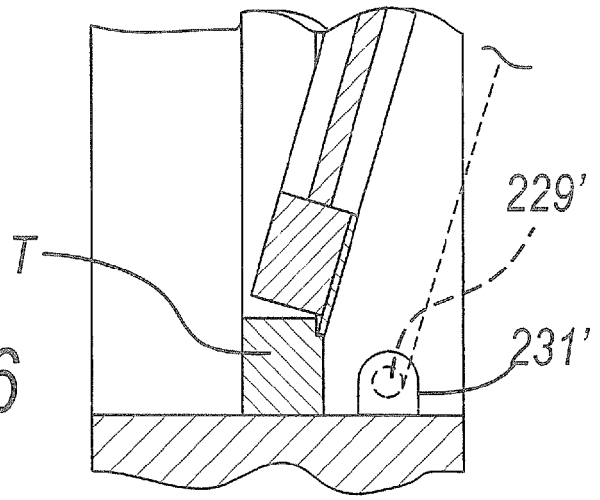

Fig. 6

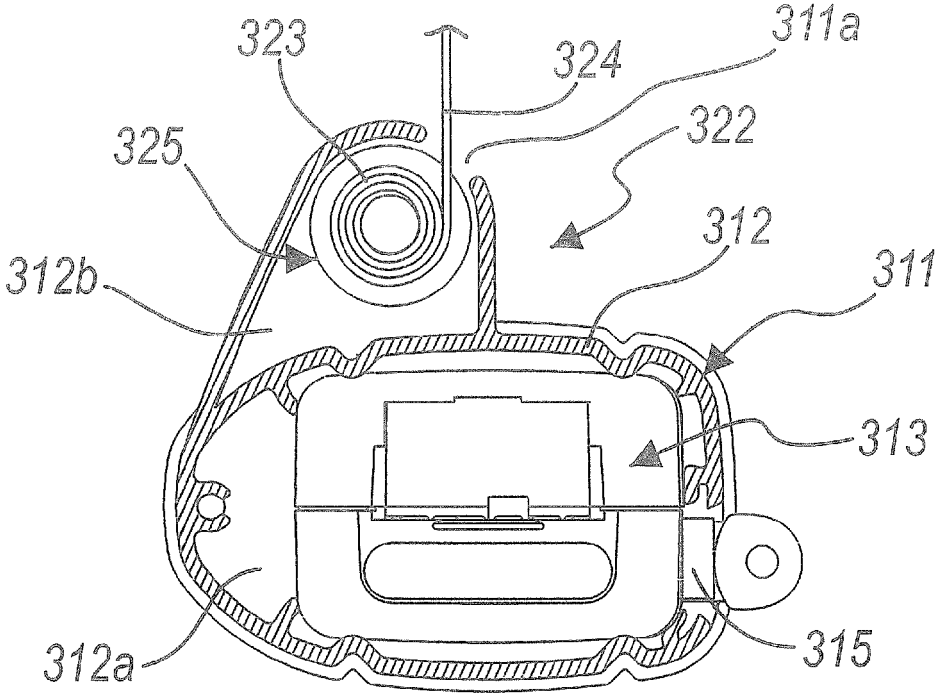
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Fig. 7

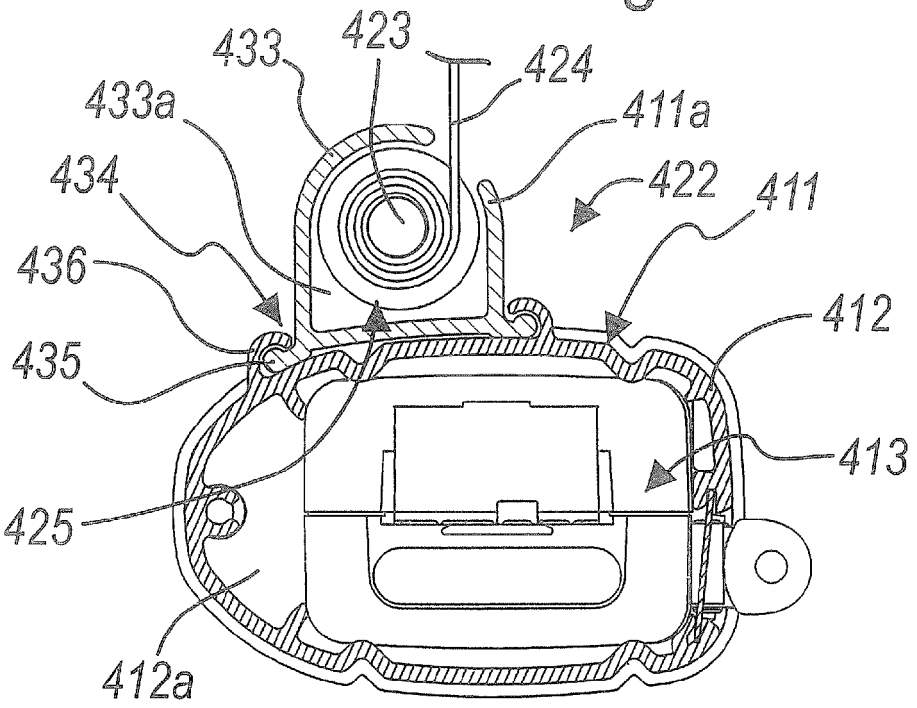
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Fig. 8

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 08 15 0028

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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A	DE 202 17 840 U1 (WINKHAUS FA AUGUST [DE]) 6 February 2003 (2003-02-06) * figure 1 *	1-10	
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TECHNICAL FIELDS SEARCHED (IPC)

E05F
E06B
E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 April 2008	Di Renzo, Raffaele

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 08 15 0028

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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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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