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(54) Actuation assembly for moving casements

(57) An actuation assembly for moving casements, of the type which comprises an outer enclosure (11, 111, 211, 311) for containing the electromechanical components for actuation (13) and the electronic components for management and control (16), comprising rain detection sensor means (24, 124, 224, 324) which are integrated on a position (25, 125, 225, 325) of the outer enclosure (11, 111, 211, 311) and are connected directly to the electronic components (16), adapted to actuate the closing movement of an associated casement (S) if the detection is positive.

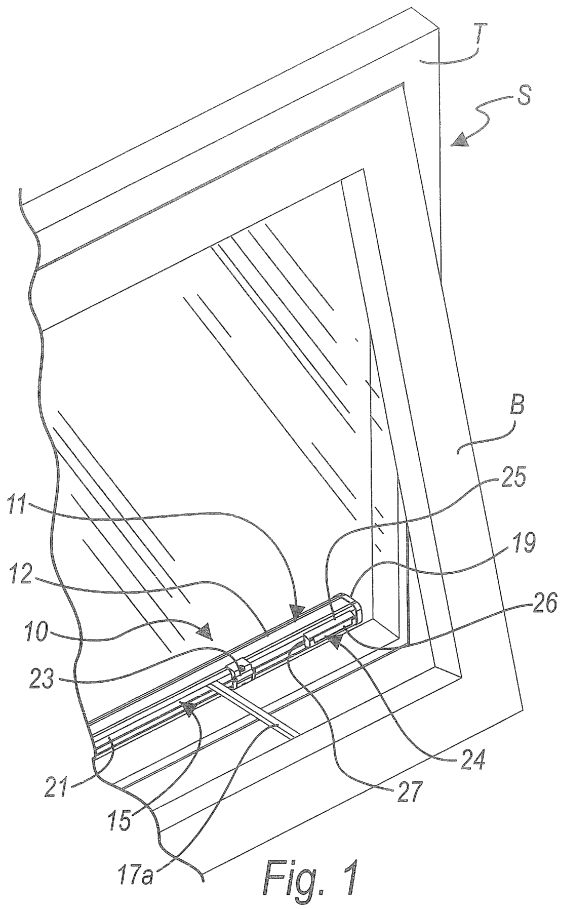

Fig. 1

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Description

[0001] The present invention relates to an actuation assembly for moving casements.

[0002] As is known, in various fields of application, and particularly in the field of casements, actuators have long been used which allow an effective movement of leaves especially of the tilting, swing-out, transom, vertical type and others.

[0003] These actuators allow to open and close the casements on demand without requiring manual interventions on the casement itself.

[0004] This is particularly convenient especially in the case of casements arranged in positions which are difficult to reach, such as for example lofts, skylights, window wells, et cetera.

[0005] These actuators can also be timer-controlled, so as to allow their opening and closure at preset times of day.

[0006] Especially in these last cases, when there is no particular human control, since it is already programmed, some practical drawbacks can arise.

[0007] Among these, the most typical is linked to the need to close the casements in non-programmed periods due to the presence of rain.

[0008] When the number of casements is large, the activation time for all the actuators can be substantial, unless a single control is created which activates all of them simultaneously.

[0009] The most significant problem is linked in any case to the moment when the beginning of rain is determined.

[0010] The person assigned to controlling the opening of the casements in fact may not always realize that it has begun to rain, with the evident problems that arise from this.

[0011] There are rain detection sensors which can be connected to the actuators in order to allow them to act so as to close autonomously when it begins to rain.

[0012] Installing these sensors on actuators, however, is laborious, since it is necessary to work (for example by providing holes) on the outer enclosures of the actuators in order to create the couplings of the sensors to the outer enclosures and provide the passages for cables for connecting the sensor and the electromechanical components, or it is necessary to install these sensors externally, for example on the roof, structuring the corresponding wiring.

[0013] It is evident that such "assembly" is hardly ever optimum, since it is affected by the working skills of the person who performs it, by the shape of the enclosure and by the "compatibility" of the sensors and of the fixing means, with the risk of subsequent "separation" due to poor fixing or infiltrations of moisture inside the enclosure, or due to passage of water through the holes provided in order to carry the wiring of the sensors fitted externally from the outside to the inside.

[0014] The aim of the present invention is to solve the drawbacks observed in actuation assemblies for moving casements, by providing an actuation assembly for moving casements which can be actuated autonomously in case of rain.

[0015] Within this aim, an object of the present invention is to provide an actuation assembly for moving casements which can be actuated autonomously in case of rain and can be installed simply and quickly.

[0016] Another object of the present invention is to provide an actuation assembly for moving casements which has a particularly compact and sturdy structure and does not require particular work for installation.

[0017] This aim and these and other objects, which will become better apparent hereinafter, are achieved by an actuation assembly for moving casements, of the type which comprises an outer enclosure for containing the electromechanical components for actuation and the electronic components for management and control, characterized in that it comprises rain detection sensor means which are integrated on a position of said outer enclosure and are connected directly to said electronic components, adapted to actuate the closing movement of the casements if the detection is positive.

[0018] Further characteristics and advantages of the invention will become better apparent from the following detailed description of some preferred but not exclusive embodiments thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a front perspective view of a portion of a casement to which a first embodiment of an actuation assembly for moving it, according to the invention, is applied;

Figure 2 is a top view of the device of Figure 1 not applied to the casement;

Figure 3 is a transverse sectional view, taken along the line III -III, of the detail of Figure 2;

Figure 4 is a view of a portion of a casement with a second embodiment of an actuation assembly according to the invention;

Figure 5 is a view of a portion of a casement with a third embodiment of an actuation assembly according to the invention;

Figure 6 is a view of a portion of a casement with a fourth embodiment of an actuation assembly according to the invention;

Figure 7 is a simplified electrical diagram of an actuation assembly according to the preceding embodiments (particularly referred to the embodiment of Figure 1).

[0019] 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.

[0020] With reference to Figures 1, 2, 3 and 7, a first embodiment of an actuation assembly according to the invention is generally designated by the reference numeral 10.

[0021] The actuation assembly 10 is for example associated with a casement S, which is composed of a frame T and a leaf B which is hinged on the upper side and opens outward.

[0022] The actuation assembly 10 is constituted by an outer enclosure 11 for containing the electromechanical components for actuation and the electronic components for management and control.

[0023] In this embodiment, the outer enclosure 11 is constituted by an extruded body 12 (for example made of aluminum) with an open transverse profile, inside which there are two similar actuators 13 of the single-chain type (shown not in cross-section in Figure 3) which are aligned at a preset distance, each having an outer functional end 14 of Figure 2 of the respective chain preset so as to pass through an open portion 15 (Figure 3) of the transverse profile of the extruded body 12.

[0024] Inside the outer enclosure 11 there is also an electronic board 16 for controlling and managing the actuators 13.

[0025] The outer enclosure 11 has a supporting and covering function for the actuators 13, which are substantially identical and of a known type.

[0026] 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 (not shown in the figures) motor means which are connected to a reduction assembly, which in turn is coupled by means of a sprocket which meshes with a guided chain (shown schematically by a continuous element designated by the reference numeral 17a in Figure 1), which has the outer functional end 14 which is preset to pass through a corresponding gap (not shown in the figures) formed in the containment box.

[0027] Two complementarily shaped closure plugs 19 are provided at two end portions 18 of the extruded body 12 and also are associated by insertion and locked on the extruded body 12 by means of screws (not shown in the figures).

[0028] One of the two closure plugs 19 has a grommet (not shown in the figures) in order to make the power supply and actuation wiring of the actuators 13 exit.

[0029] Means for covering the open portion 15 of the transverse profile of the extruded body 12, such as for example plates 21 made of plastics which are fixed to the inner portions of the edges of the open portion 15 and in particular are inserted in mutually opposite slots 22 provided on said edges, are associated with the extruded body 12.

[0030] The outer enclosure 10 has means for fixing to the casement (in this embodiment, to the frame T), such as for example a pair of brackets 23 (only one is visible in the figures).

[0031] The device comprises rain detection sensor means 24, which are integrated on an appropriately provided position 25 of the outer enclosure 11 and are connected directly to the electronic components of the actuation assembly, as better described hereinafter, so as to actuate the closing movement of the casements in case of positive sensing.

[0032] In this first described embodiment, the rain detection sensor means 24 comprise two rain detection sensors 26, which are arranged on corresponding supports 27 which are fixed directly on the outer enclosure 11 so that the rain detection sensors 26 maintain the same position with respect to the outer enclosure 11 regardless of the opening or closure of the casement.

[0033] In particular, each support 27 is arranged on a corresponding end of the open portion 15 of the transverse profile of the extruded body 12.

[0034] Each support 27 is constituted by a body, on one outer face 28 of which the rain detection sensor 26 is arranged.

[0035] The body 28 is rigidly coupled to the outer enclosure 11 by means of mutually opposite parts which are inserted within the mutually opposite slots 22 formed on the edges of the open portion 15.

[0036] It is important to stress that in the position 25 of the outer enclosure 11 there are means adapted to allow the provision of the rain detection sensor means 24 and that in this embodiment said means are constituted in practice by the mutually opposite slots 22 of the edges of the open portion 15 of the extruded body 12.

[0037] Figure 7 illustrates an example of an electrical connection diagram of the various components.

[0038] The rain detection sensors 26 are connected by means of wires 29 to the electronic board 16 for the management and control of the actuation of the actuators 13. The actuators 13 are therefore connected to the electronic board 16 by means of additional wires 30; the board 16 is then connected, for example by means of a last pair of wires 31 (which might also be a single multipolar cable) to an external power supply 32.

[0039] The operation of the invention is as follows. The sensors 26 are arranged at the most exposed regions of the outer enclosure 11 and therefore the regions that can be reached more easily by rain.

[0040] Once such sensors detect rain, they actuate the actuators 13 so that they are activated, retracting the chain 17a and consequently the leaf B of the casement S toward the frame T.

[0041] Figure 4 illustrates a second embodiment of the invention, generally designated by the reference numeral 100, which differs from the preceding one in the type of coupling of the rain detection sensor means 124 to the outer enclosure 111.

[0042] In particular, the rain detection sensor means 124 comprise at least one rain detection sensor 126, which is arranged on the free end 135 of a corresponding support 127 which is rigidly coupled to the outer enclosure 111 and means 136 for moving the support 127 from a position in which the free end 135 cantilevers outward toward the outside of the casement S when said casement is open to a position of minimum space occupation

adjacent to the outer enclosure 111 when the casement S is closed; the movement means 136 are coordinated with the movement of the casement S.

[0043] For example, in this embodiment, the support 127 is constituted by an arm 137 which is coupled by means of one of its ends to a portion 138 for fixing to a preset position 125 of the outer enclosure 111 (in particular, the preset position 125 corresponds to an end of the open portion 115 of the transverse profile of the extruded body 112).

[0044] The movement means 136 for the support 127 (the arm 137) of the rain detection sensor 126 are constituted for example by a hinge 137a for rigidly coupling the first arm 137 to the portion 138 for fixing to the enclosure 111, which allows the end of the first arm 137 on which the sensor 126 is provided to rotate through a circular arc from the outside toward the inside of the casement and vice versa.

[0045] Means 131 for contrasting the movement of the first arm 137 toward the inside of the casement are associated with the hinge coupling and are constituted for example by a torsion spring, which contrasts rotation toward the inside of the casement.

[0046] In this case, the first arm 137 with the sensor 126 at its end cantilevers toward the outside of the casement, in a lateral direction with respect to its perimeter (but always inside said perimeter), ensuring greater exposure to the rain than the sensors of the previous embodiment.

[0047] When the sensor detects rain, it sends the signal to the actuator, closing the leaf B of the casement S, which during the closure stroke touches the first arm 137, moving it inward (overcoming the contrast force of the torsion springs).

[0048] Figure 5 shows a third embodiment of the actuation assembly according to the invention, generally designated by the reference numeral 200, which differs from the preceding embodiment in the type of the means 236 for moving the support 227 for the rain detection sensor 226 from a position in which the free end 235 cantilevers toward the outside of the casement S when it is open to a position of minimum space occupation adjacent to the outer enclosure 211 when the casement S is closed.

[0049] In particular, the support 227 is constituted by a first arm 237, which is rigidly coupled by means of one of its ends to a portion 238 for fixing to a preset position 225 of the outer enclosure 111 (in particular, the preset position 225 corresponds to an end of the open portion of the transverse profile of the extruded body 212); at the free end, the first arm 237 has the rain detection sensor 226.

[0050] The movement means 236 for the support 227 (the first arm 237) of the rain detection sensor 226 are constituted for example by a first hinge coupling 237a for the first arm 237 at a first end of a second arm 239, which in turn is pivoted by a second end, by means of a second hinge 239a, to the portion 238 for fixing to the enclosure 211; said articulation system allows the free end of the first arm 237 on which the sensor 226 is provided to move on a plane from the outside toward the inside of the casement and vice versa.

[0051] Means 232 for contrasting the movement of the first arm 237 toward the inside of the casement (not shown in the figures) are associated with the first hinge 237a between the first arm 237 and the second arm 239 and with the second hinge 239a between the second arm 239 and the fixing portion 238, and are constituted for example by corresponding torsion springs which are arranged at the first and second hinges.

[0052] Advantageously, an actuation rod 240 is pivoted by means of one of its ends, by way of a third hinge 241, to the same axis as the hinge 237a and its opposite end is always in contact with the leaf of the casement.

[0053] Means 242 for contrasting the rotation toward the inside of the casement are associated with the third hinge 241.

[0054] The rotation contrasting means 242 have a contrast force which is greater than the means for contrasting the movement of the second arm 239.

[0055] For example, the means 242 for contrasting rotation are constituted for example by a torsion spring which is associated with the third hinge and is more rigid than the torsion spring associated with the second hinge 239a.

[0056] The portion 238 for fixing to the enclosure 211 of the second arm 239 comprises for example a box-like element 243 for containing the first arm 237, the second arm 239 and the actuation rod 240 when they are folded in the step for minimum space occupation with the leaf closed against the frame; the box-like element 243 is for example fixed at the front to the open portion of the transverse profile of the extruded body 12 (with numeric reference to the first described embodiment), in particular by coupling its own mutually opposite parts inserted within the mutually opposite slots 22 provided on the edges of the open portion 15 shown in the preceding

examples.

[0057] In this case, the articulation of the first arm 237 and of the second arm 239 allow the sensor 226 to be exposed externally and laterally at the outer perimeter of the casement more than in the previous embodiment.

[0058] When rain is detected, the sensors 226 actuate the actuators (and the chain 217a) and close the leaf B; said leaf pushes against the actuation rod 240 (which slides on the leaf B) and forces the axis for the pivoting of the first arm 237 to the second arm 239 toward the inside of the casement S until the second arm 239 rotates completely inside the box-like element 243.

[0059] At this point, the actuation rod 240 also starts rotating toward the inside of the casement, until it becomes parallel to the first arm 237; at this point, they continue together the rotation toward the inside of the casement, until they enter the box-like element 243.

[0060] Figure 6 illustrates a fourth embodiment of the actuation assembly, generally designated by the reference numeral 300.

[0061] The fourth embodiment 300 differs from the last two embodiments in the type of means 336 for moving the support 327 for the rain detection sensor 326 from a position in which the free end 335 cantilevers toward the outside of the casement S when it is open to a position of minimum space occupation adjacent to the outer enclosure 311 when the casement S is closed.

[0062] For example, in this embodiment the support 327 is constituted by an arm 337 which is rigidly coupled by means of one of its ends to a portion 338 for fixing to a preset position 325 of the outer enclosure 311 (in particular, the preset position 325 is defined on an outer face which is perpendicular to the one on which the open portion of the extruded body 312 is formed; the means which allow the provision are for example holes which allow, by means of threaded elements, connection to the enclosure 311 or also of the elements adapted to allow snap engagement with the support 327.

[0063] The movement means 336 for the support 327 (the arm 337) of the rain detection sensor 326 are constituted for example by a hinge 337a for coupling one end of the arm 337 to the portion 338 for fixing to the outer enclosure 311, which allows the free end of the arm 337, on which the sensor 326 is provided, to rotate on a circular arc from the outside toward the inside of the casement and vice versa.

[0064] Moreover, the movement means 336 comprise a strut element 344 which protrudes from the portion 338 for fixing to the outer enclosure 311 toward the leaf B, abutting against it with one of its ends.

[0065] The strut element has at least one part which can perform a translational motion in the direction of its extension and is mechanically connected to the hinge 337a for coupling the arm 337 to the portion 338 for fixing to the outer enclosure 311, so that a translational motion toward the inside of the casement (closure of the leaf) is matched by a rotation of the arm 337 also toward the inside of the casement, while an outward translational motion (opening of the leaf) is matched by an outward rotation of the arm (and therefore of the rain detection sensor).

[0066] In particular, in this embodiment the strut element 344 is telescopic and is associated with elastic means for contrasting the translational motion of at least the parts that can perform a translational motion toward the inside of the casement (not shown in the figures).

[0067] In practice it has been found that the invention thus described achieves the intended aim and objects.

[0068] The present invention in fact provides an actuation assembly which allows to move casements so as to close them when it begins to rain.

[0069] This has been achieved in practice by integrating rain detection sensor means on suitable positions of the outer enclosure of the actuation assembly.

[0070] In this manner it is not necessary to install awkwardly and inaccurately external sensors or rain detection sensors on actuators of a known type, since everything is already ready for use.

[0071] The particular structure of the actuation assembly which comprises the outer enclosure for containing the actual actuators allows optimum positioning of the sensors.

[0072] The outer enclosure can in fact be cut to size according to the width of the casement and the sensors can be arranged at the ends of said enclosure; in this manner, said sensors are arranged in the outermost point and can detect the rain conveniently.

[0073] It is evident that the idea of having rain detection sensors which are integrated on preset positions of the outer enclosure can also be applied to the case of an enclosure which contains directly the electromechanical components (motors, chain winding sprockets, et cetera) and not the actuators already composed and ready for use as in the described examples.

[0074] Further, the particular structure of the actuation assembly allows to reduce manufacturing and storage costs with respect to known types of two-chain actuator.

[0075] The present invention in fact provides an actuation assembly which has two or more single-chain actuators, which can be used normally as individual actuators and are combined together inside a common supporting structure which can be sized cheaply for the specific requirements of the market.

[0076] The actuator manufacturer in fact manufactures and stores single-chain actuators and uses simple extruded bodies, which can be manufactured easily and cheaply according to the chosen measurements and in which the single-chain actuators are inserted so as to provide a multiple-chain actuator.

[0077] The easy combining of the rain detection sensors with this structure allows optimum flexibility in the configuration of such assembly according to the requirements of use.

[0078] Costs for design and manufacture (and for storage) of all double-chain actuators which require a dedicated containment box for the actuation components (electric motors, reduction units, chains) are thus reduced.

[0079] Further, the actuation assembly has an extremely simple structure, and this facilitates considerably both installation and maintenance.

[0080] 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.

[0081] 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.

[0082] The disclosures in Italian Patent Application No. PD2007A000026 from which this application claims priority are incorporated herein by reference.

[0083] 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 casements, of the type which comprises an outer enclosure (11, 111, 211, 311) for containing the electromechanical components for actuation (13) and the electronic components for management and control (16), **characterized in that** it comprises rain detection sensor means (24, 124, 224, 324) which are integrated on a position (25, 125, 225, 325) of said outer enclosure (11, 111, 211, 311) and are connected directly to said electronic components (16), adapted to actuate the closing movement of an associated casement (S) if the detection is positive.

2. The actuation assembly for moving casements according to claim 1, **characterized in that** said outer enclosure (11, 111, 211, 311) is constituted by an extruded body (12, 112, 212, 312) with an open transverse profile, inside which there is at least one actuator (13) of the chain type which has the outer functional end (14) of the respective chain (17a) preset so as to pass through the open portion (15) of the transverse profile of said extruded body (12, 112, 212, 312), inside said outer enclosure (11, 111, 211, 311) there being an electronic board (16) for controlling and managing said at least one actuator (13) of the chain type, to which said rain detection sensor means (124, 224, 324) are connected directly.

3. The actuation assembly for moving casements according to one of the preceding claims, **characterized in that** said rain detection sensor means (24, 124, 224, 324) comprise at least one rain detection sensor (26, 126, 226, 326) which is arranged on a support (27, 127, 227, 327) which is fixed on said preset position (25, 125, 225, 325) of said outer enclosure (11, 111, 211,311).

4. The actuation assembly for moving casements according to claims 2 and 3, **characterized in that** said support (27, 127, 227) is fixed on preset internal portions of the edges of said open portion (15) of the transverse profile of said extruded body (12, 112, 212).

5. The actuation assembly for moving casements according to claim 4, **characterized in that** said support (27) is constituted by a body which is fixed directly onto said outer enclosure (11) and is adapted to keep the same position with respect to said enclosure (11) regardless of the opening or closure of said casement (S).

6. The actuation assembly for moving casements according to claim 4, **characterized in that** said rain detection sensor means (124, 224, 324) comprise at least one rain detection sensor (126, 226, 326) which is arranged on the free end (135, 235, 335) of said support (127, 227, 327) rigidly coupled to said outer enclosure (111, 211, 311), said rain detection sensor means (124, 224, 324) comprising means (136, 236, 336) for moving said support (127, 227, 327) from a position in which said free end (135, 235, 335) cantilevers toward the outside of the casement (S) when said casement (S) is open, to a position of minimum space occupation which is adjacent to said outer enclosure (111, 211, 311) when said casement (S) is closed, said movement means (136, 236, 336) being coordinated with the movement of said casement (S).

7. The actuation assembly for moving casements according to claim 6, **characterized in that** said support (127) is constituted by an arm (137) which is rigidly coupled by means of one of its ends to a portion (138) for fixing to said preset position (125) of said outer enclosure (111), said movement means (136) for said support (127) of the rain detection sensor (126) being constituted by a hinge (137a) for coupling said arm (137) to the portion (138) for fixing to said outer enclosure (111), said hinge allowing the free end (135) of said arm (137) on which said sensor (126) is provided to rotate through a circular arc from the outside toward the inside of the casement (S) and vice versa, means (131) for contrasting the movement of said arm (137) toward the inside of the casement being associated with said hinge coupling.

8. The actuation assembly for moving casements according to claim 6, **characterized in that** said support (227) is constituted by a first arm (237), which is rigidly coupled by means of one of its ends to a portion (238) for fixing to said preset position (225) of the outer enclosure (211), said first arm (237) having, at the free end (235), said rain detection sensor (226), said movement means (236) for said support (227) comprising a first hinge (237a) for coupling said first arm (237) to a first end of a second arm (239) which in turn is pivoted by a second end, by means of a second hinge (239a), to the portion (238) for fixing to said outer enclosure (211), said hinge system (237a, 239a) allowing the free end of said arm (237) on which said sensor (226) is provided to move on a plane from the outside toward the inside of the casement and vice versa, said movement means (236) for said support (227) further comprising

means (232) for contrasting the movement of said first arm (237) and said second arm (239) toward the inside of the casement (S).

9. The actuation assembly for moving casements according to claim 8, **characterized in that** it comprises an actuation rod (240) which is pivoted by way of one of its ends, by way of a third hinge (241), to the same axis as said first hinge (237a), said actuation rod (240) having the opposite end always in contact with the leaf (B) of the casement (S), means (242) for contrasting rotation toward the inside of the casement being associated with said third hinge (241), said means (242) for contrasting rotation having a contrast force which is greater than that of the means for contrasting the movement of said second arm (239).

10. The actuation assembly for moving casements according to claim 6, **characterized in that** said support (327) comprises an arm (337) which is rigidly coupled by means of one of its ends to a portion (338) for fixing to said preset position (325) of said outer enclosure (311), said movement means (336) for said support (327) of the rain detection sensor (326) comprising a hinge (337a) for rigidly coupling an end of said arm (337) to the portion (338) for fixing to said outer enclosure (311), which allows the free end of said arm (337), on which said sensor (326) is provided, to rotate through a circular arc from the outside toward the inside of the casement and vice versa, said movement means (336) comprising further a strut element (344), which protrudes from the portion (338) for fixing to said outer enclosure (311) toward the leaf (B), said strut element (344) abutting with one of its ends against said leaf (B), said strut element (344) further having at least one part which can perform a translational motion in the direction of its extension which is connected mechanically to said hinge (337a) of said arm (337) to said portion (338) for fixing to the outer enclosure (311), so that a translational motion toward the inside of the casement (S) which corresponds to the closure of the leaf (B) produces a rotation of said arm (337) also toward the inside of the casement (S), whereas an outward translational motion, which corresponds to the opening of the leaf (B), produces a rotation of said arm (337) toward the outside.

11. The actuation assembly for moving casements according to claim 10, **characterized in that** said strut element (344) is telescopic and is associated with elastic means for contrasting the translational motion of at least one part which can perform a translational motion of said strut element (344) toward the inside of the casement (S).

12. An actuation assembly for moving casements, of the type which comprises an outer enclosure for containing the electromechanical components for actuation and the electronic components for management and control, **characterized in that** in at least one position (25, 125, 225, 325) of said outer enclosure (11, 111, 211, 311) there are means which are adapted to allow the provision of the rain detection sensor means (24, 124, 224, 324) to be connected directly, by means of suitable connections, to said electronic components.

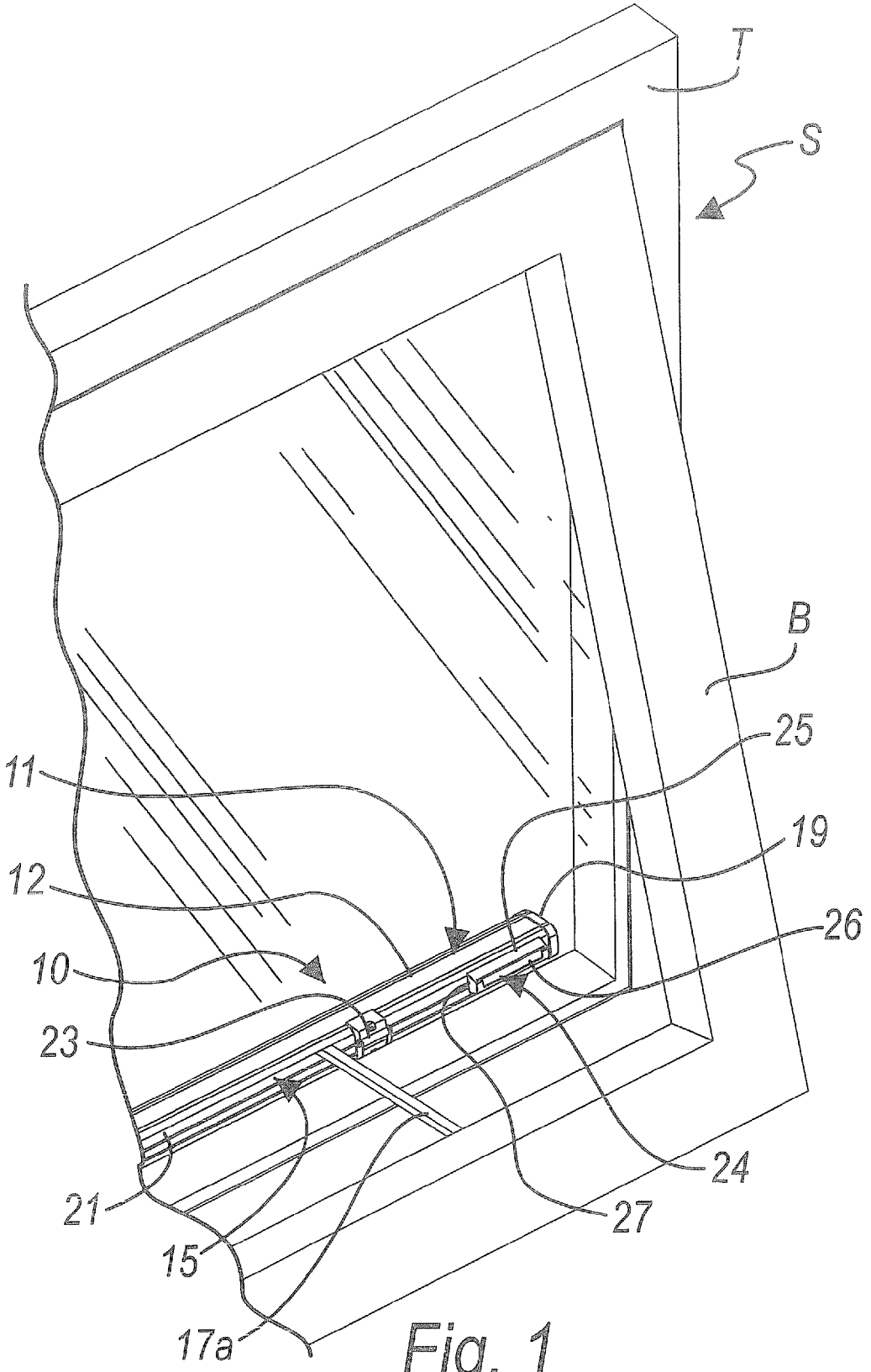


Fig. 1

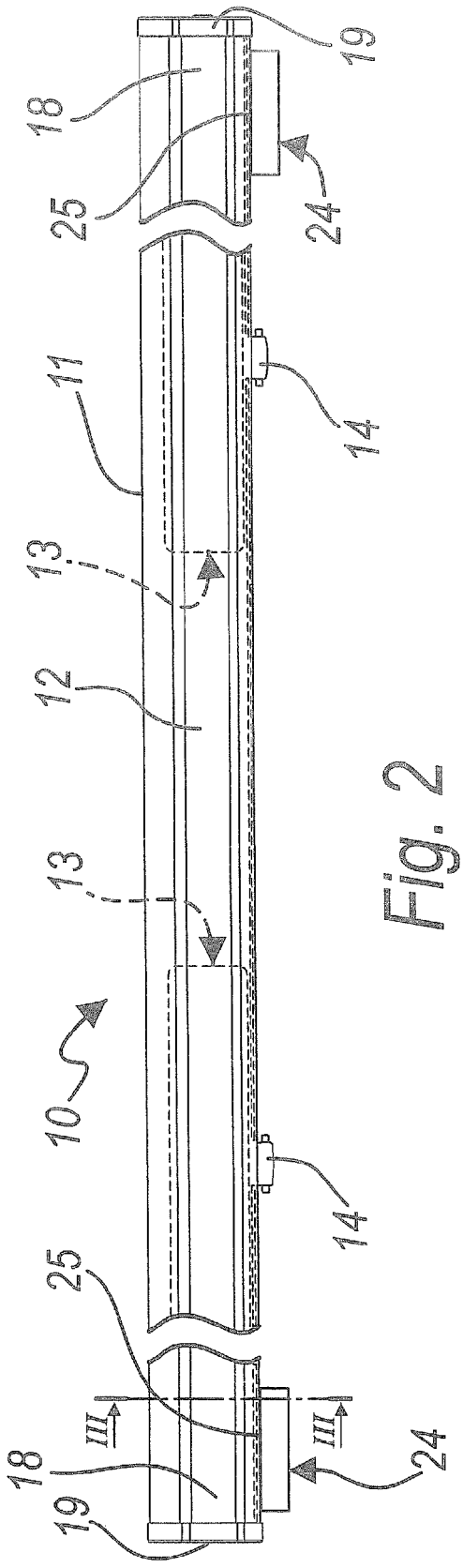


Fig. 2

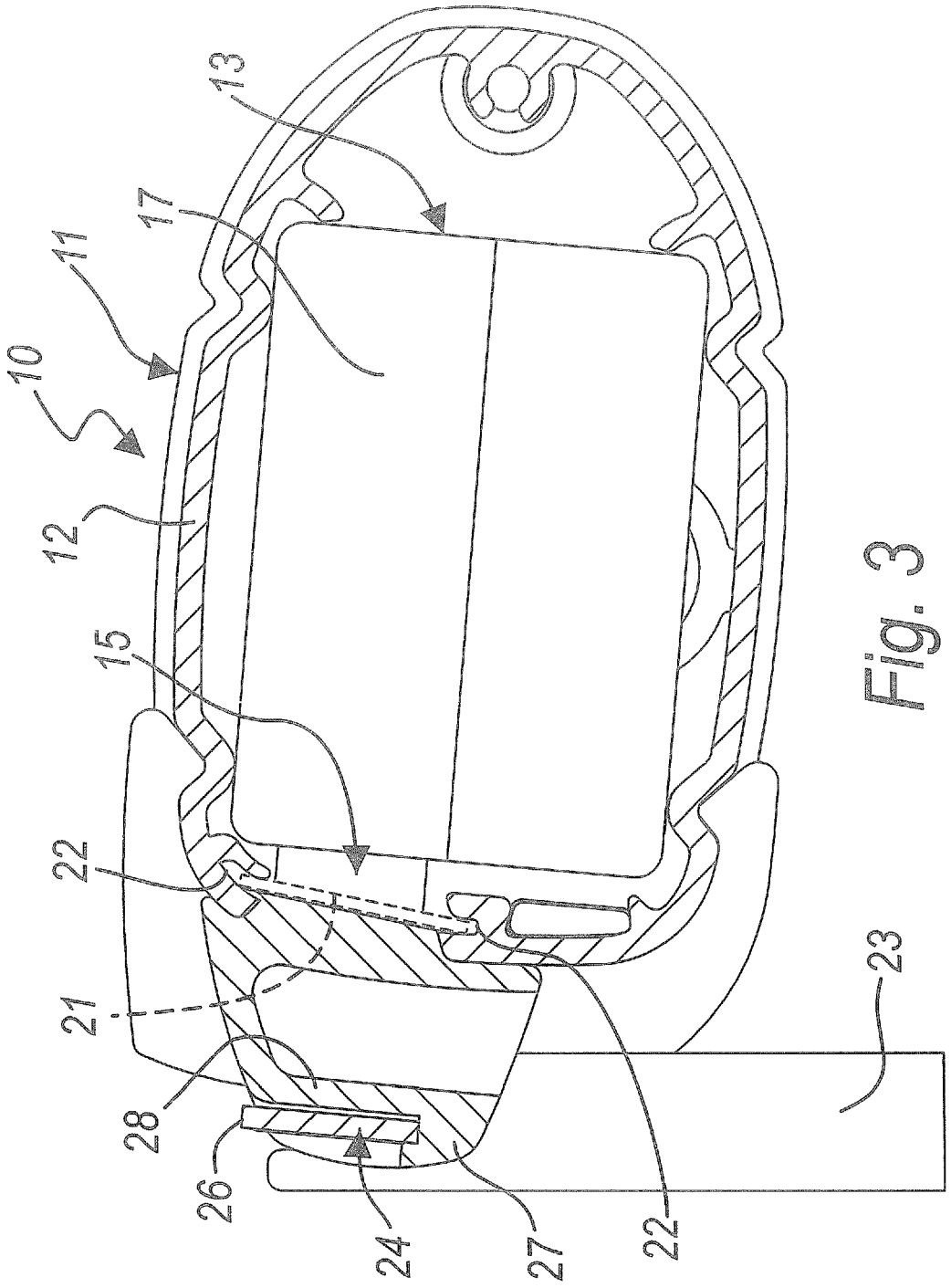


Fig. 3

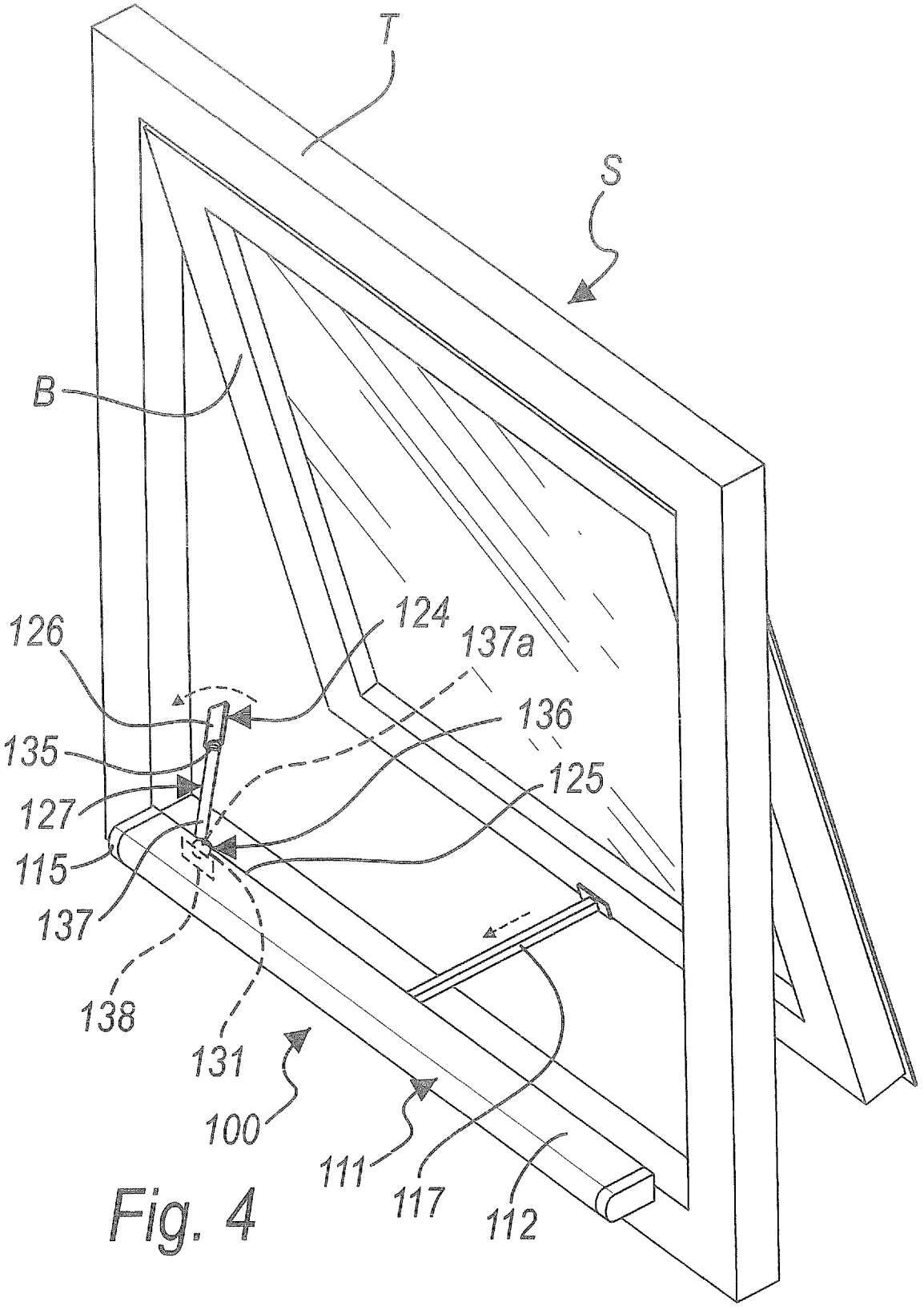
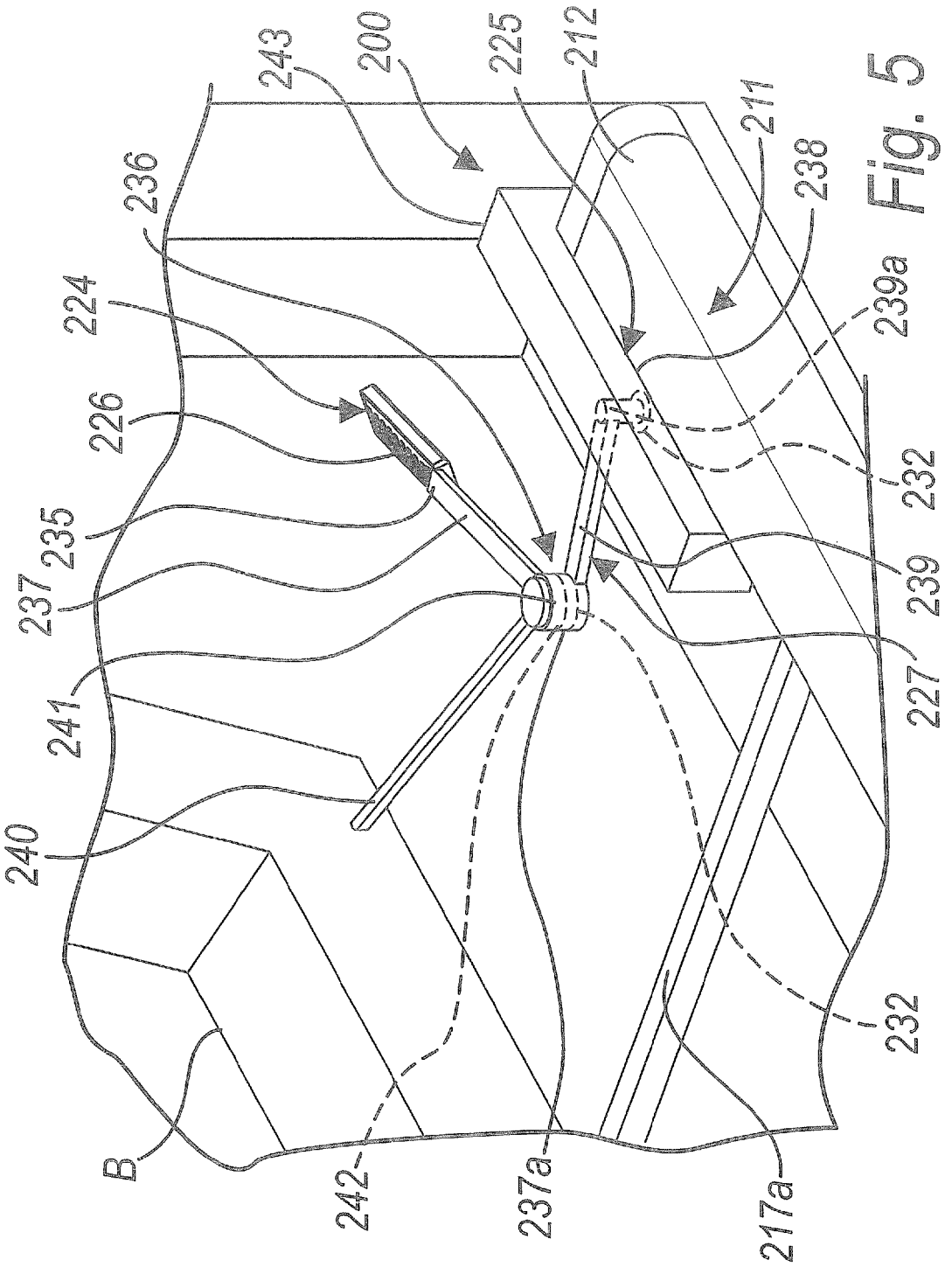


Fig. 4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217a

Fig. 5

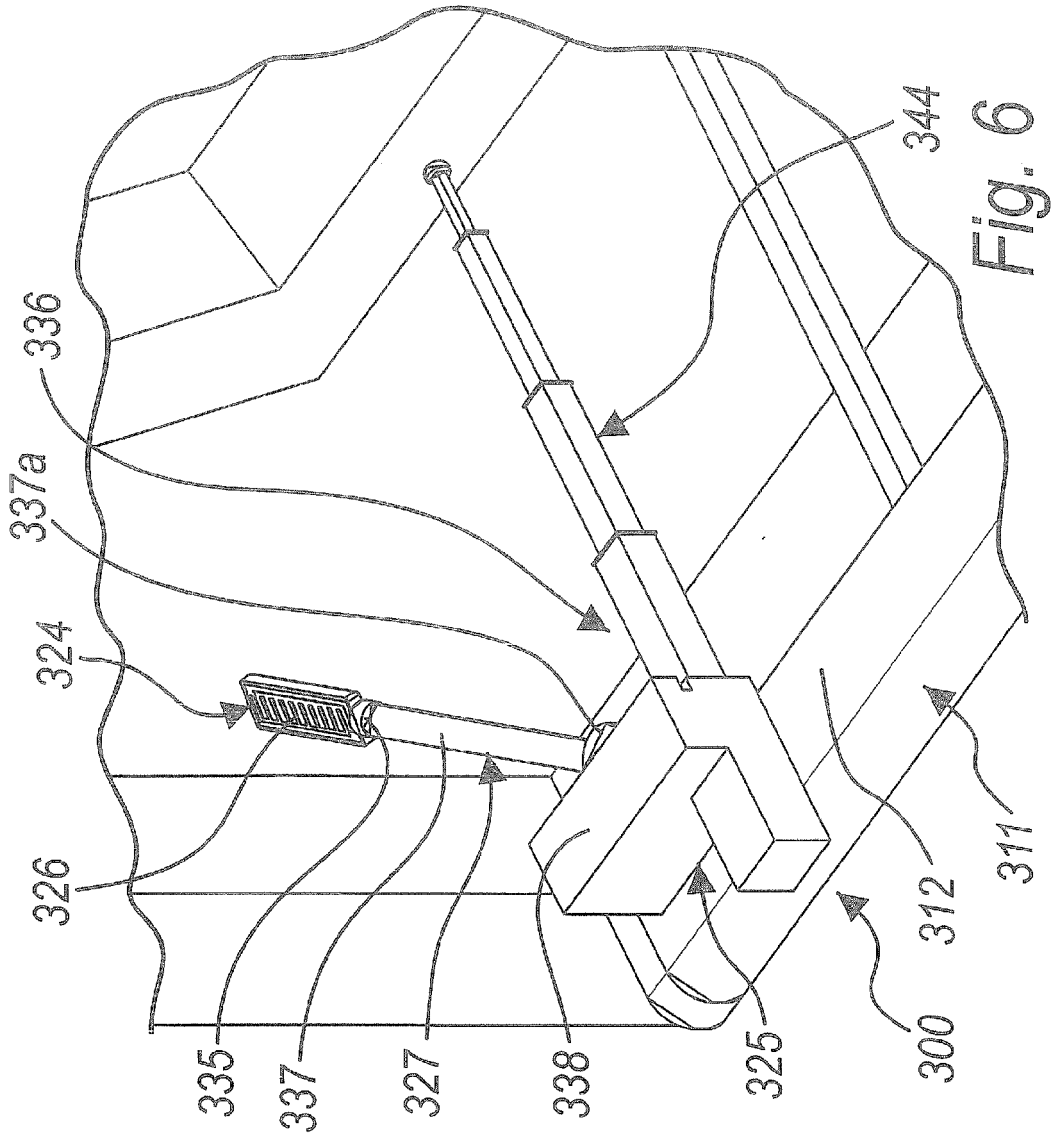

Fig. 6

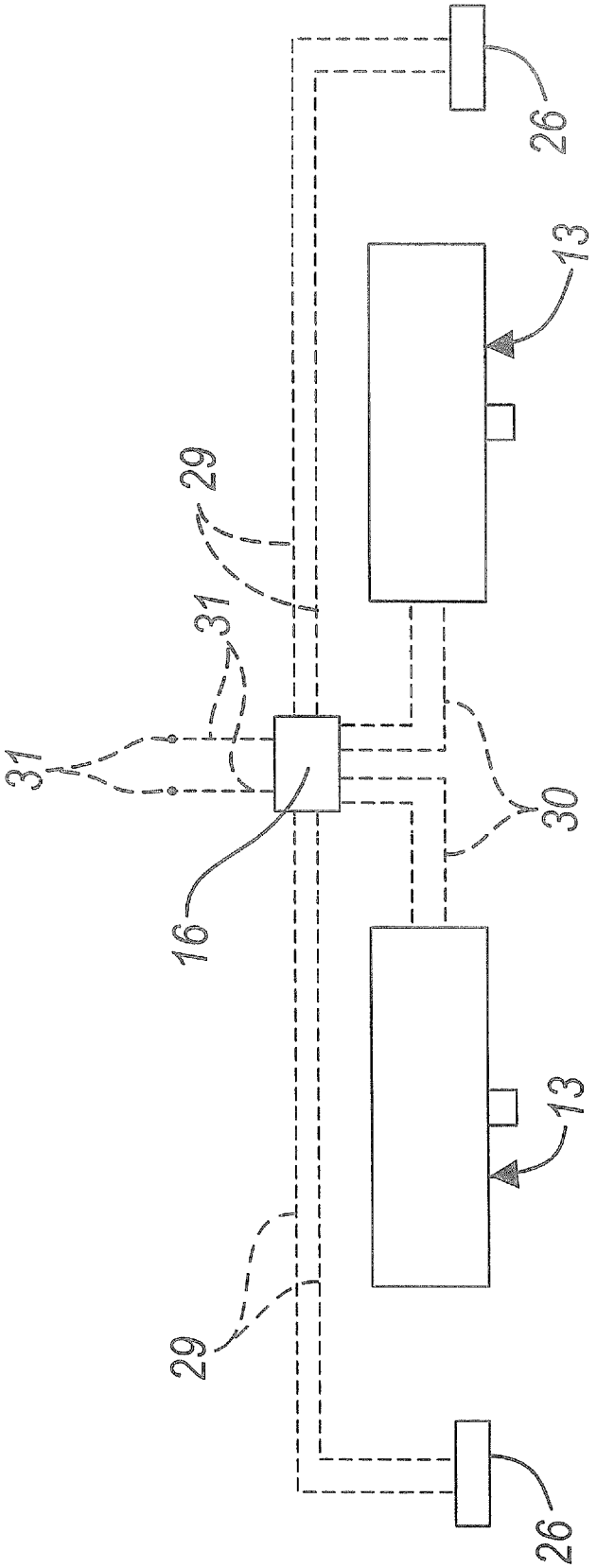

Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 08 15 0026

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	US 7 114 389 B1 (MOURIDSEN ERIK BUNDSBAEK [DK]) 3 October 2006 (2006-10-03)	1-5,12	INV. E05F15/12
A	* the whole document *	6-11	E05F15/20

X	US 5 006 766 A (YUHAS RALPH G [US] ET AL) 9 April 1991 (1991-04-09)	1-5,12	
A	* the whole document *	6-11	

X	US 2 759 725 A (CLARK WILLIAM J) 21 August 1956 (1956-08-21) * the whole document *	1,12	

A	EP 1 081 324 A (GEZE GMBH [DE]) 7 March 2001 (2001-03-07) * figures *	1-12	

TECHNICAL FIELDS SEARCHED (IPC)

E05F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	5 May 2008	Di Renzo, Raffaele

CATEGORY OF CITED DOCUMENTS

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05-05-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 7114389 B1	03-10-2006	AU 7646500 A	22-04-2002
		CN 1454281 A	05-11-2003
		DE 20080336 U1	05-06-2003
		WO 0231304 A1	18-04-2002
		HK 1057914 A1	17-11-2006
		JP 3721163 B2	30-11-2005
		JP 2004514075 T	13-05-2004
US 5006766 A	09-04-1991	CA 2022623 A1	15-02-1991
US 2759725 A	21-08-1956	NONE	
EP 1081324 A	07-03-2001	DE 19942052 A1	08-03-2001

EPO FORM P0459

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT PD20070026 A **[0082]**