(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 177 708 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
21.04.2010 Bulletin 2010/16

(51) Int Cl.:
E06B 9/86 *(2006.01)* ***E06B 9/44*** *(2006.01)*

(21) Application number: **09173327.9**

(22) Date of filing: **16.10.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
AL BA RS

(30) Priority: **20.10.2008 IT BO20080645**

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(54) **Security device, particularly for doors or window closure elements**

(57) A security device (1), particularly for doors or window closure elements, comprising a series of links (2, 2a, 2b, 2c) arranged side by side and mutually articulated and adapted to be wrapped around a roller (3) that can rotate and be blocked selectively. The roller (3) can rotate about its own axis to move a door or window closure element (4) that in turn can be rigidly associated with an end link (2a) of the series of links (2, 2a, 2b, 2c). When the roller (3) is blocked, the links (2) interposed between the end link (2a) and an adjustment link (2b) connected to the roller (3) are arranged, following an unwanted lifting of the door or window closure element (4), in a configuration for blocking by geometric interference and friction of the translational motion thereof. The security device (1) comprises means (5) for selective coupling of the roller (3) to one of a plurality of links (2, 2a, 2b, 2c), the link (2, 2a, 2b, 2c) chosen for coupling forming the adjustment link (2b).

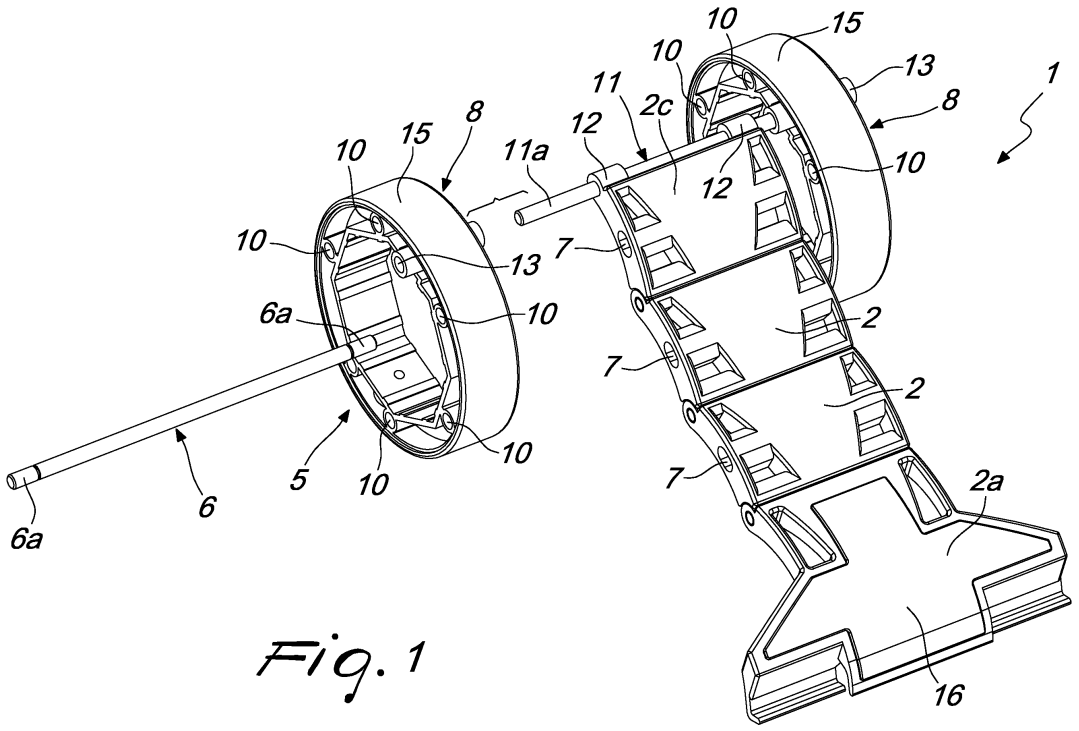

Fig. 1

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Description

[0001] The present invention relates to a security device particularly for doors or window closure elements.

[0002] Currently, the need is particularly felt to provide shutters, blinds and other door or window closure elements with security devices that prevent or at least discourage the increasingly frequent attempts to intrude into homes and other buildings in general by thieves and other ill-intentioned individuals.

[0003] Among the plurality of devices and equipment that therefore offer this protection according to different operating principles, accessories are known which are activated automatically when the shutter (or blind) is lowered, preventing its lifting if it is not actuated by the motorized roll-up roller, which can be operated from the inside.

[0004] These accessories comprise blocks which are interposed between the roller and the top of the blind and substantially consist of a series of links, each of which is hinged to the next.

[0005] If one attempts to lift the shutter, by pushing or pulling upward directly on the elements of the blind, at least one link is arranged so as to apply a downward pressure and therefore a blocking action by interference, which prevents lifting.

[0006] However, this constructive solution is not free from drawbacks.

[0007] The installation technician must choose the right accessory among a series of blocks of different length, with which he is provided, depending on the space available between the axis of the roller and the top of the blind.

[0008] In turn, this parameter is correlated to the roll-up diameter, to the distance of the roller of the guide and to the height of the slats of the blind.

[0009] These dimensions are not known in advance or at least not precisely, and therefore the installation technician is often forced to replace the block chosen initially with another one of different length (or to eliminate one or more links), since often the most suitable size can be determined only during assembly operations and after one or two attempts.

[0010] It appears therefore evident that the described difficulties make installation steps time-consuming and awkward, further forcing the worker to obtain preliminarily a plurality of different blocks, to take with him during work.

[0011] The aim of the present invention is to solve the problems described above, by providing a security device, particularly for doors or window closure elements, for which installation is simple and fast, regardless of the dimensions of the elements involved.

[0012] Within this aim, an object of the invention is to provide a security device that ensures high reliability in operation.

[0013] Another object of the invention is to provide a security device that requires minimal maintenance interventions.

[0014] Another object of the invention is to provide a security device that can be obtained easily starting from commonly commercially available elements and materials.

[0015] Another object of the invention is to provide a security device that has low costs and is safe in application.

[0016] This aim and these and other objects which will become better apparent hereinafter are achieved by a security device, particularly for doors or window closure elements, comprising a series of links arranged side by side and mutually articulated and adapted to wrap around a roller that can rotate and be blocked selectively, said roller being able to rotate about its own axis to move a door or window closure element that can be rigidly associated with an end link of said series of links, when the roller is blocked, the links interposed between said end link and an adjustment link connected to the roller are arranged, following an unwanted lifting of the door or window closure element, in a configuration for blocking by geometric interference and friction of the translational motion thereof, **characterized in that** it comprises means for selective coupling of the roller to one of a plurality of said links, the link chosen for coupling forming said adjustment link.

[0017] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment of the security device according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is an at least partially exploded side perspective front view of a security device according to the invention;
Figure 2 is a side perspective rear view of a detail of the security device according to the invention;
Figure 3 is a side elevation view of the security device according to the invention in the blocking configuration;
Figure 4 is a perspective view of the security device according to the invention, completely wrapped around the roller;
Figure 5 is a front elevation view of the security device of Figure 4;
Figure 6 is a side elevation view of the security device of Figure 4;
Figure 7 is a perspective view of the security device according to the invention in a first operating configuration;
Figure 8 is a perspective view of the security device according to the invention in a second operating configuration;
Figure 9 is a perspective view of the security device according to the invention in a third operating configuration.

[0018] With reference to the figures, a security device

according to the invention, generally designated by the reference numeral 1, comprises a series of links 2, 2a, 2b, 2c, which are arranged side by side and are mutually articulated and can be wrapped around a roller 3 which can rotate and can be blocked selectively.

[0019] The roller 3, which can have an octagonal cross-section according to various dimensions and can be for example of the motorized type, can rotate about its own axis in order to move a door or window closure element 4, which can be associated rigidly with an end link 2a of the series of links 2, 2a, 2b, 2c.

[0020] The rotation of the roller 3 thus causes the lowering of the door or window closure element 4, until access to a door or window is completely obstructed, or causes its lifting, until it is wrapped partially or totally, as shown in Figure 4, around the roller 3, allowing access to the door or window.

[0021] The door or window closure element 4 can be for example a blind, a shutter, a vertically-hung shutter, or any other element for which the application of the security device 1 according to the invention is suitable.

[0022] According to known embodiments, when the roller 3 is blocked (for example because the motor with which it is associated has not been activated or due to the actuation of a manual stop element), the security device 1 can contrast the translational motion of the door or window closure element 4 in order to prevent the unwanted lifting thereof.

[0023] In fact, if a thief, for example, attempts to lift the blind, with the roller 3 blocked, the links 2 interposed between the end link 2a and an adjustment link 2b connected to the roller 3 contrast the lifting action, since they are arranged in the blocking configuration (shown in Figure 3) that corresponds to an extended arrangement of the links 2, which by geometric interference and friction thus prevent the translational motion of the door or window closure element 4.

[0024] According to the invention, the security device 1 comprises means 5 for the selective coupling of the roller 3 with one of a plurality of links 2, 2a, 2b, 2c: the link 2, 2a, 2b, 2c chosen for coupling defines the adjustment link 2b.

[0025] More particularly, in the embodiment shown in the accompanying figures, each link 2, 2b, 2c, except for the end link 2a, can be chosen as an adjustment link 2b according to specific requirements of application.

[0026] Reference shall be made therefore, in the continuation of the present description, to this solution, which does not limit the application of the invention.

[0027] In particular, the means 5 comprise a pivot 6, which can be inserted selectively in any one of the respective recesses 7 formed in each link 2, 2b, 2c: it is therefore possible, during the installation of the security device 1 according to the invention, to identify in any link 2, 2b, 2c the one most suitable for constituting the adjustment link 2b.

[0028] Once the pivot 6 has been inserted in the selected recess 7, the end portions 6a of the pivot 6 that protrude on opposite sides from the recesses 7 can be associated functionally with the roller 3 for its coupling to the chosen link 2, 2b, 2c.

[0029] According to the embodiment shown in the accompanying figures, provided by way of non-limiting example of the application of the invention, the security device 1 comprises a pair of bushes 8, which can be fixed to the roller 3 (optionally by means of screws 9) on opposite sides with respect to the series of links 2, 2a, 2b, 2c.

[0030] A first link 2c, which lies opposite the end link 2a, is pivoted to each bush 8 about an articulation axis which is parallel to the axis of the roller 3.

[0031] For achieving the selective coupling of the pivot 6 with the adjustment link 2b, the means 5 comprise a plurality of receptacles 10, which are arranged peripherally along each bush 8.

[0032] Each receptacle 10 can thus receive and stably accommodate the end portions 6a of the pivot 6: thus, with the pivot 6 inserted in the recess 7 of the chosen link 2, 2b, 2c and the protruding end portions 6a inserted in the most suitable receptacle 10, the desired coupling of the roller 3 with the link chosen as the adjustment link 2b is provided.

[0033] In particular, as can be deduced from the accompanying figures, the first link 2c, the adjustment link 2b and any links 2 interposed between them are wrapped around the roller 3, forming substantially a rigid coupling between the security device 1 and the roller 3.

[0034] More particularly, the pivoting of the first link 2c to the bushes 8 around the above cited articulation axis is provided at a pin 11, which can be inserted in at least one eye 12 (two eyes in the embodiment shown in the accompanying figures) formed in the first link 2c.

[0035] Each bush 8 therefore comprises a respective seat 13, which in order to provide pivoting can receive and stably accommodate a respective end 11a of the pin 11, which protrudes outside the eyes 12 of the first link 2c.

[0036] Conveniently, the security device 1 according to the invention comprises a plurality of springs 14: as is evident in particular from Figure 2, each spring 14 is fixed to a respective link 2, 2a, 2b, 2c and abuts against the next link.

[0037] As illustrated more clearly hereinafter, the elastic action of the springs 14 facilitates the extended arrangement of the links 2 interposed between the end link 2a and the adjustment link 2b and therefore the blocking of translational motion in case of an attempt to lift the door or window closure element 4.

[0038] According to an embodiment of substantial practical interest, the security device 1 comprises a covering ring 15 for each bush 8: for protecting the bushes 8 against scratches and/or dents, the material that constitutes the rings 15 has a high resistance to abrasion and is for example of the rubber type.

[0039] For extending the above cited protection against scratches and/or dents also to the links 2, 2a, 2b, 2c of the device 1, at least the end link 2a comprises a superficial coating layer 16, which is made of a material

that also has a high resistance to abrasion and again can be of the rubber type.

[0040] The protective scope of the invention claimed herein obviously includes embodiments that resort to materials with high resistance to abrasion for covering the outer surface regions of the other links 2, 2b, 2c of the device 1.

[0041] Moreover, the entire links 2, 2a, 2b, 2c of the security device 1 according to the invention might be made of such materials.

[0042] Advantageously, the end link 2a has a dovetail shape, as is evident for example from the accompanying Figures 1 and 4.

[0043] This configuration makes it possible to contain the overall space occupation of the security device 1 according to the invention when the latter is completely wrapped around the roller 3, in the configuration shown in Figure 4, which corresponds to complete lifting of the door or window closure element 4.

[0044] The operation of the security device according to the invention is as follows.

[0045] During assembly, the end link 2a is hinged to the top of the door or window closure element 4.

[0046] For identifying the adjustment link 2b and completing the installation of the device 1 it is sufficient to gently pull the series of links 2, 2a, 2b, 2c, for example by gently lifting the above cited top of the door or window closure element 4.

[0047] In this way it is easy to note the number of links 2, 2a, 2b, 2c that rest on and are wrapped around the roller 3: this number of course depends on the dimensional parameters of the elements involved, in particular on the dimensions and mutual distances between the door or window closure element 4 and the roller 3, on which intervention is not possible.

[0048] Once the number of links 2, 2a, 2b, 2c that rest on and are wrapped around the roller 3 has been identified, it is sufficient to pivot to the roller 3 the last one of them, which constitutes the adjustment link 2b, by means of the pivot 6, and further hinge the first link 2c, by means of the pin 11, substantially ending assembly.

[0049] Any links 2 that are interposed between the first link 2c and the adjustment link 2b are permanently rested on and wrapped around the roller 3.

[0050] Vice versa, the remaining links 2, as well as the end link 2a, are wrapped around the roller 3 only after a possible rotation of the roller 3 for lifting of the door or window closure element 4: the action of the roller 3 and the force applied on the links 2, 2a, 2b, 2c in this case is suitable for overcoming the elastic reaction of the springs 14.

[0051] If instead the roller 3 actuates the lowering of the door or window closure element 4, the links 2 that are interposed between the adjustment link 2b and the end link 2a extend, as in Figure 3, between the roller 3 and the door or window closure element 4.

[0052] In this arrangement, the links 2 can, as mentioned, contrast the lifting of the door or window closure element 4.

[0053] The action of the springs 14 assists this extension and makes it possible to maintain this arrangement, facilitating the blocking of the sliding motion as a consequence of unwanted lifting processes of the door or window closure element 4.

[0054] Resorting to the springs 14 therefore increases the reliability of the security device 1 according to the invention, ensuring its correct operation.

[0055] It is therefore evident that the dimensional parameters related to the roller 3 and to the door or window closure element 4, which are to be considered fixed, do not compromise the possibility of installing the security device 1 according to the invention and do not force the need for repeated attempts to find the correct setting or the resorting to different lengths of the device 1.

[0056] In the embodiment shown in the accompanying figures, which is given only by way of non-limiting example, there is a security device 1 according to the invention, which is provided as a whole with four links 2, 2a, 2b, 2c.

[0057] Figures 7, 8 and 9 illustrate three different possible operating configurations, in which the choice of the adjustment link 2b is changed depending on the specific requirements of the application.

[0058] It is specified nonetheless that the protective scope claimed herein includes constructive and installation solutions that are different from the one described here in detail merely by way of illustration. For example, the security device 1 according to the invention can provide for fixing only the adjustment link 2b to the roller 3, even in case of a dimensional configuration such as the one of Figure 9, choosing in any case to make the first link 2c coincide with the adjustment link 2b.

[0059] In this case, it is sufficient to provide for example a frame or housing that is suitable for containing and limiting the lifting of the links 2 that are interposed between the first link 2c (which indeed coincides with the adjustment link 2b) and the end link 2a, when an unwanted attempt to lift the door or window closure element 4 occurs.

[0060] The versatility of the security device 1 according to the invention and the possibility of adapting it easily, as noted, to different contexts ensures a logistical benefit in terms of reduction of store reserves and/or the number of components to be transported to the installation site, as instead was necessary for known security devices.

[0061] Finally, it should be noted that due to the simplicity of operation and of the elements suitable for ensuring blockage against lifting, and of the means 5 suitable for selective coupling and adjustment, the device 1 is substantially maintenance-free, while ensuring its effectiveness over time.

[0062] In practice it has been found that the security device according to the invention fully achieves the intended aim and object, since resorting to means for selective mating of the roller with one of a plurality of the links comprised within the security device, links which can arrange themselves in the configuration for blocking

translational motion as a consequence of unwanted attempts to lift the door or window closure element, allows simple and quick installation, regardless of the dimensions of the elements involved.

[0063] 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.

[0064] In the exemplary embodiments shown, individual characteristics, given in relation to specific examples, may actually be replaced by other different characteristics that exist in other exemplary embodiments.

[0065] Moreover, 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.

[0066] In practice, the materials used, as well as the dimensions, may be any according to requirements and to the state of the art.

[0067] The disclosures in Italian Patent Application No. BO2008A000645 from which this application claims priority are incorporated herein by reference.

[0068] 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. A security device (1) particularly for doors or window closure elements, comprising a series of links (2, 2a, 2b, 2c) arranged side by side and mutually articulated and adapted to be wrapped around a roller (3) that can rotate and can be blocked selectively, said roller (3) being able to rotate about its own axis to move a door or window closure element (4) that can be rigidly associated with an end link (2a) of said series of links (2, 2a, 2b, 2c); when the roller (3) is blocked, the links (2) interposed between said end link (2a) and an adjustment link (2b) connected to the roller (3) are arranged, following an unwanted lifting of the door or window closure element (4), in a configuration for blocking by geometric interference and friction of the translational motion thereof, **characterized in that** it comprises means (5) for selective coupling of the roller (3) to one of a plurality of said links (2, 2a, 2b, 2c), the link (2, 2a, 2b, 2c) chosen for coupling forming said adjustment link (2b).

2. The security device according to claim 1, **characterized in that** said means (5) comprise a pivot (6), which can be inserted selectively in any one of the respective recesses (7) formed in each one of said links (2, 2a, 2b, 2c), the end portions (6a) of said pivot (6) that protrude on opposite sides from said recesses (7) being functionally associable with said roller (3) for the coupling of the latter to the selected link (2, 2a, 2b, 2c), which constitutes said adjustment link (2b).

3. The security device according to claim 1, **characterized in that** it comprises a pair of bushes (8), which can be fixed to the roller (3) on sides opposite to said series of links (2, 2a, 2b, 2c), a first link (2c), which lies opposite said end link (2a), being pivoted to each one of said bushes (8) about an articulation axis that is parallel to the axis of the roller (3).

4. The security device according to one or more of the preceding claims, **characterized in that** said means (5) comprise a plurality of receptacles (10) which are distributed peripherally along each one of said bushes (8) and are adapted to receive and stably accommodate said end portions (6a) of said pivot (6), for the coupling of the latter to said adjustment link (2b).

5. The security device according to one or more of the preceding claims, **characterized in that** said first link (2c) is pivoted to each one of said bushes (8) about said articulation axis at a pin (11) that can be inserted in at least one eye (12) formed in said first link (2c), each of said bushes (8) comprising a respective seat (13) for the reception and stable accommodation of a corresponding end (11a) of said pin (11), which protrudes from said first link (2c).

6. The security device according to one or more of the preceding claims, **characterized in that** it comprises a plurality of springs (14), each of which is fixed to a respective link (2, 2a, 2b, 2c) and abuts elastically against the next one for facilitating the arrangement of said links (2) interposed between said end link (2a) and said adjustment link (2b) in said locking configuration.

7. The security device according to one or more of the preceding claims, **characterized in that** it comprises a ring (15) for covering each one of said bushes (8), the material said rings (15) are made of having a high resistance to abrasion.

8. The security device according to one or more of the preceding claims, **characterized in that** at least said end link (2a) comprises a superficial coating layer (16), the material that forms said superficial layer (16) having a high resistance to abrasion.

9. The security device according to one or more of the preceding claims, **characterized in that** said end link (2a) has a dovetail shape in order to contain the

space occupation of said device (1) in the configuration in which it is completely wound around the roller (3).

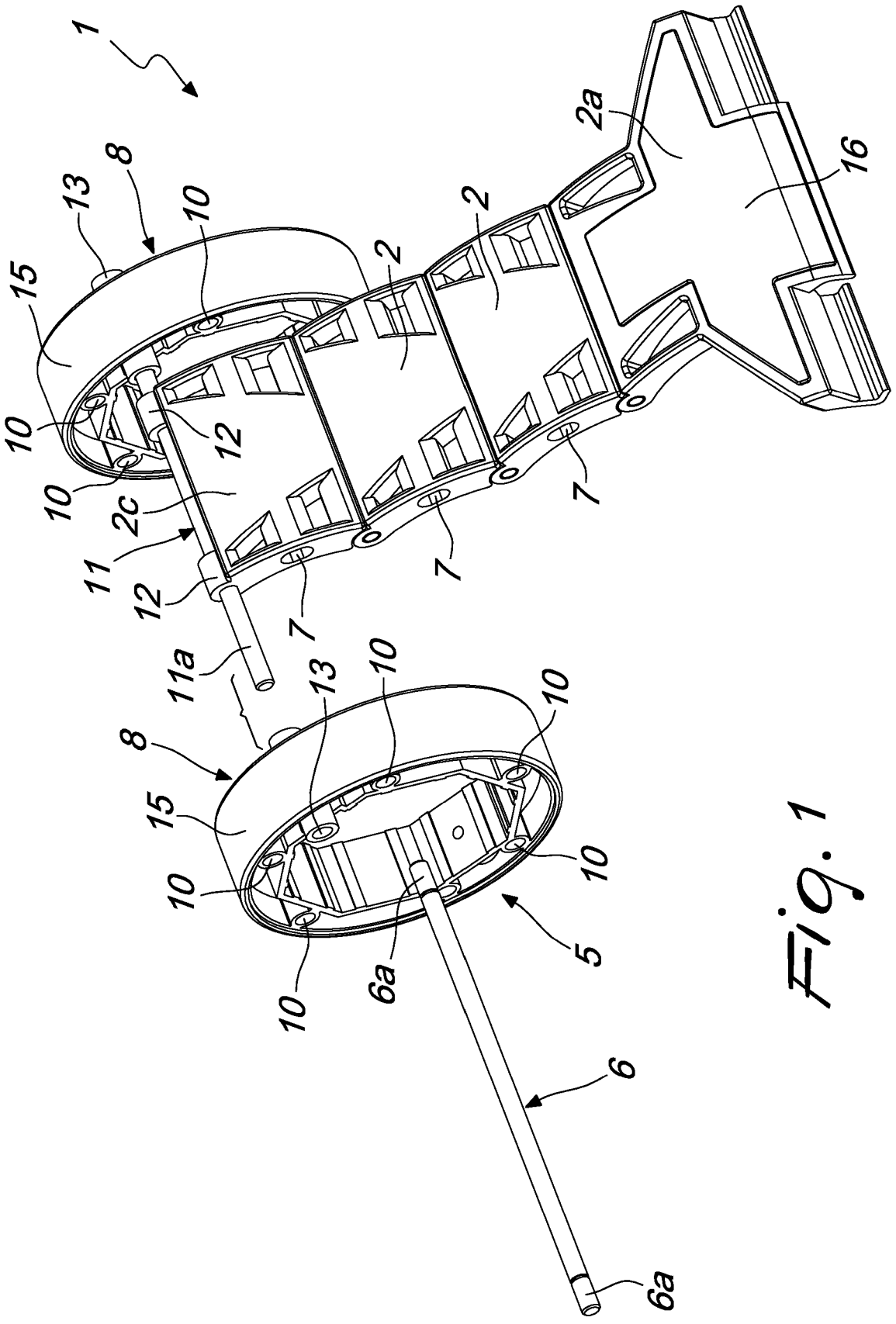
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Fig. 1

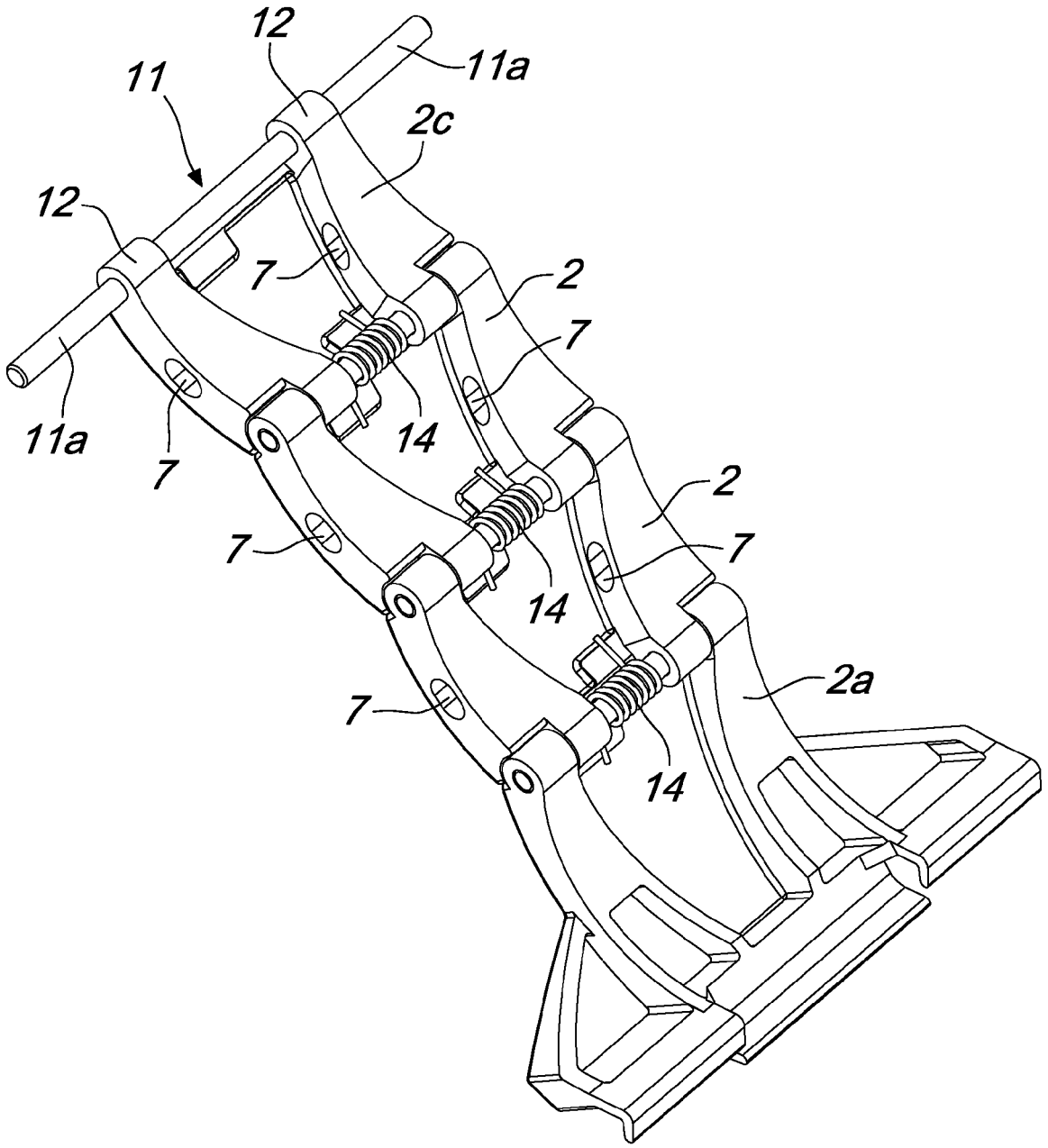

Fig. 2

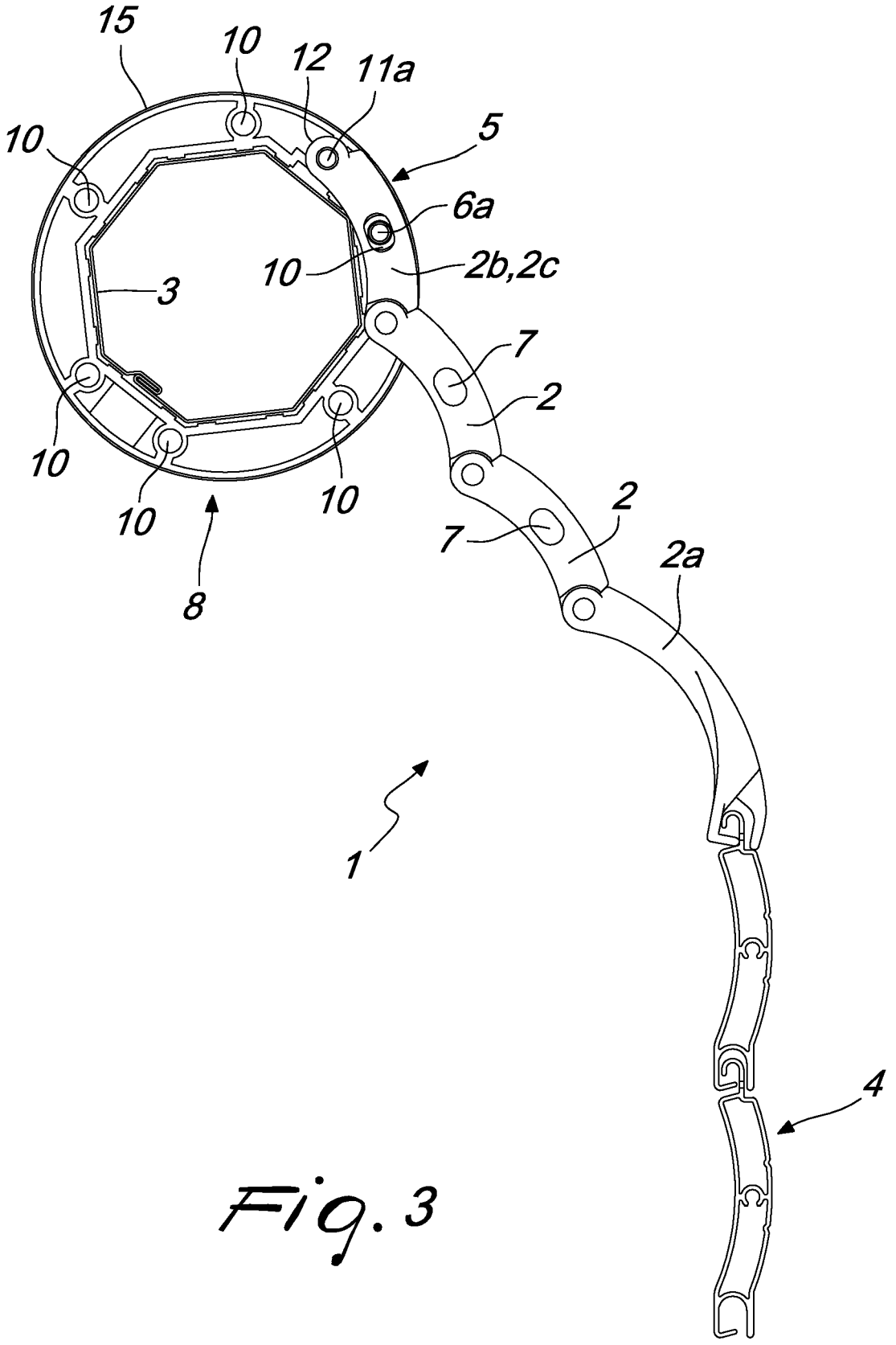

Fig. 3

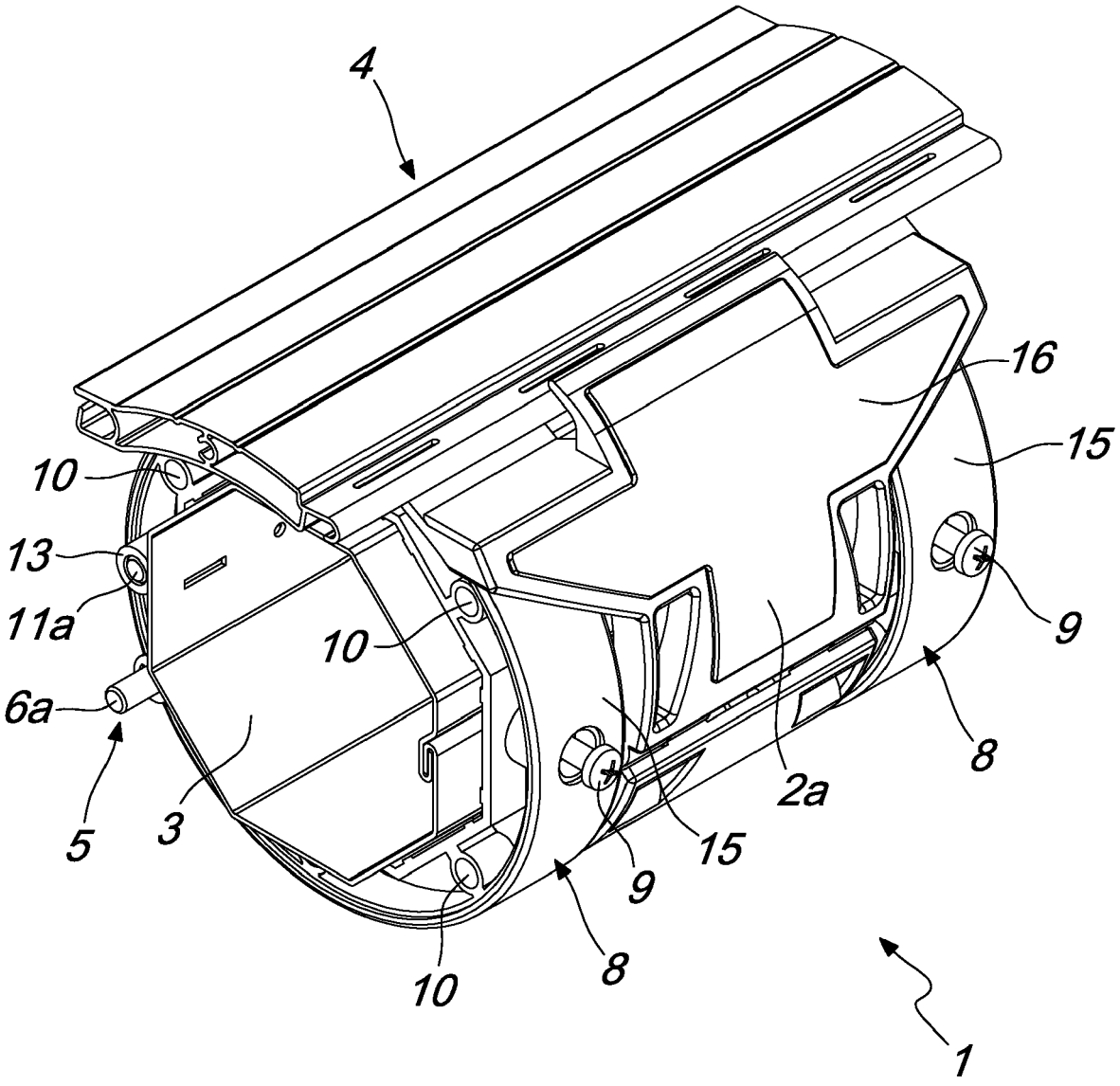

Fig. 4

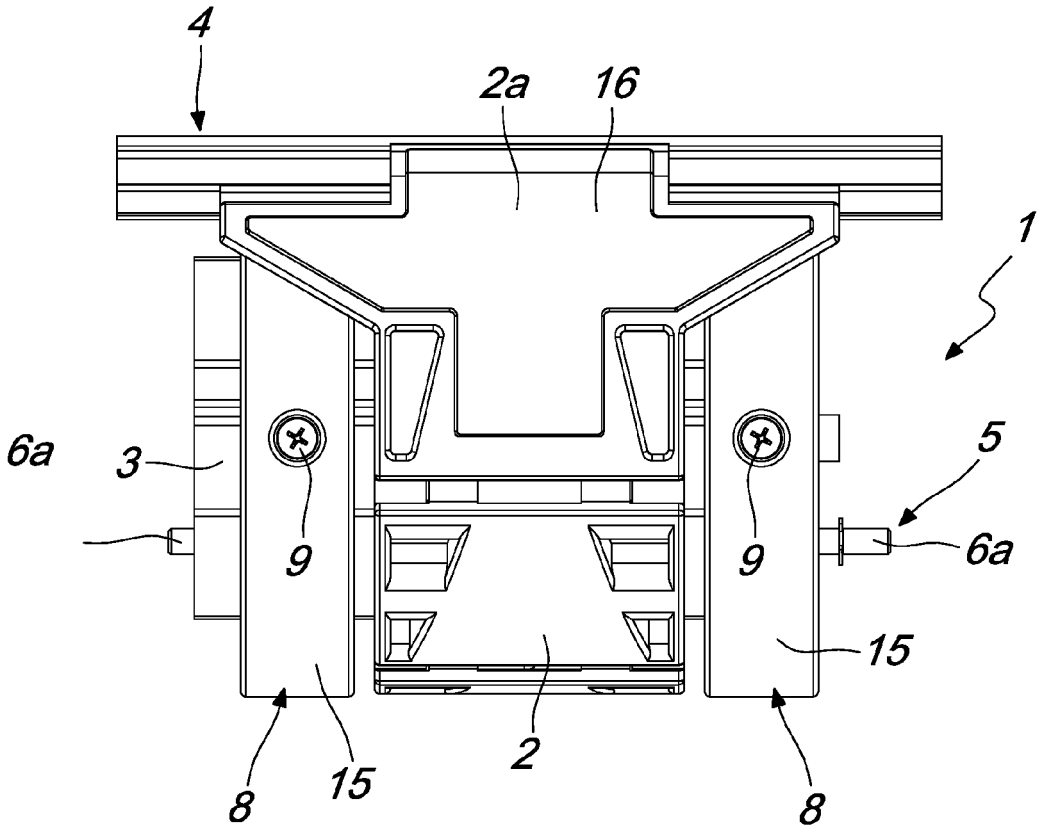
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Fig. 5

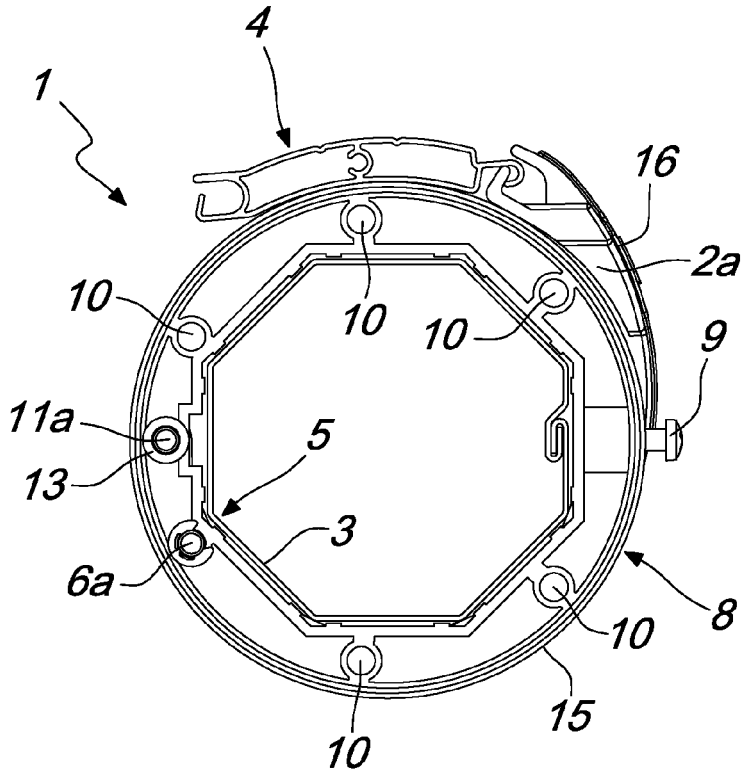
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Fig. 6

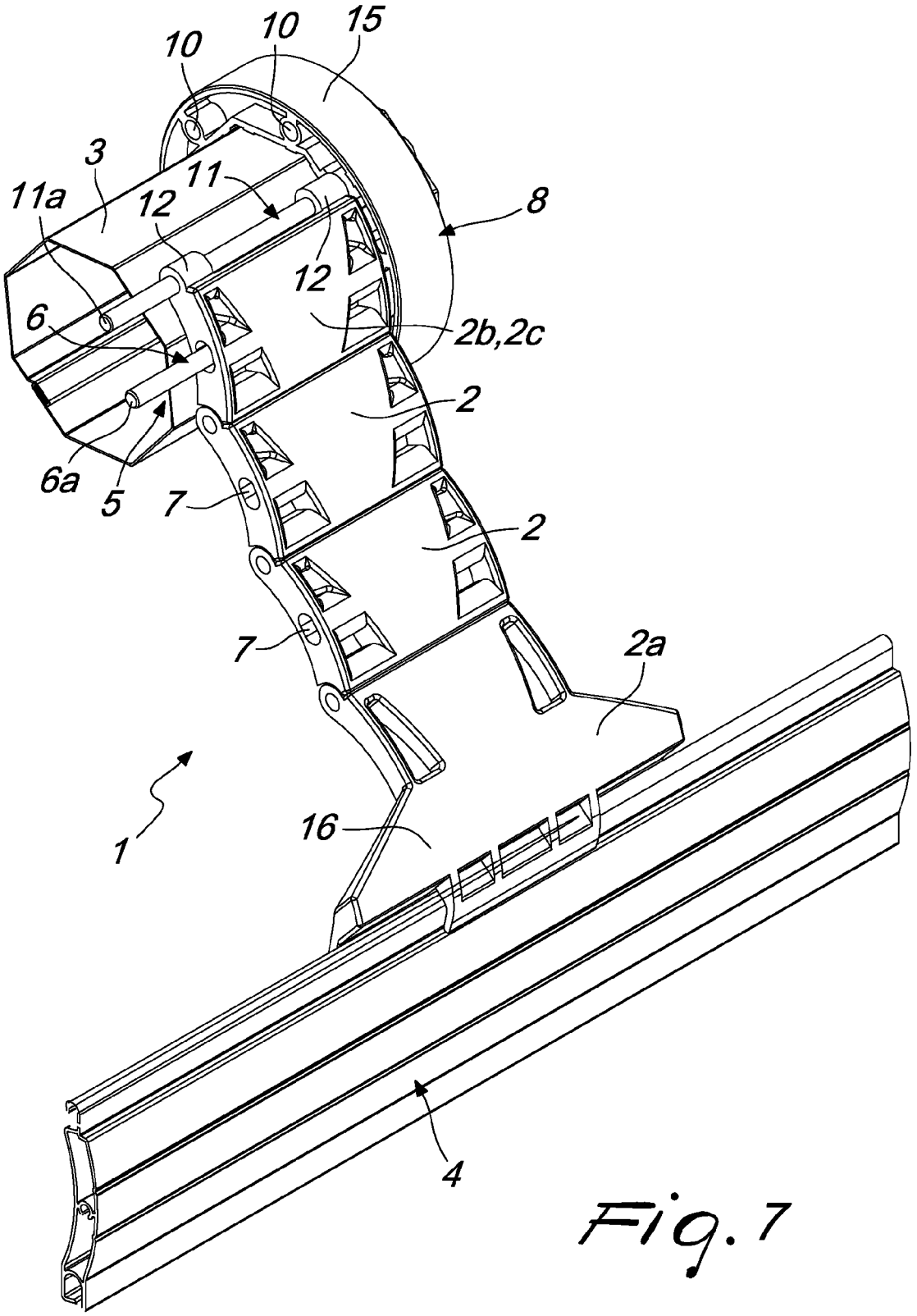

Fig. 7

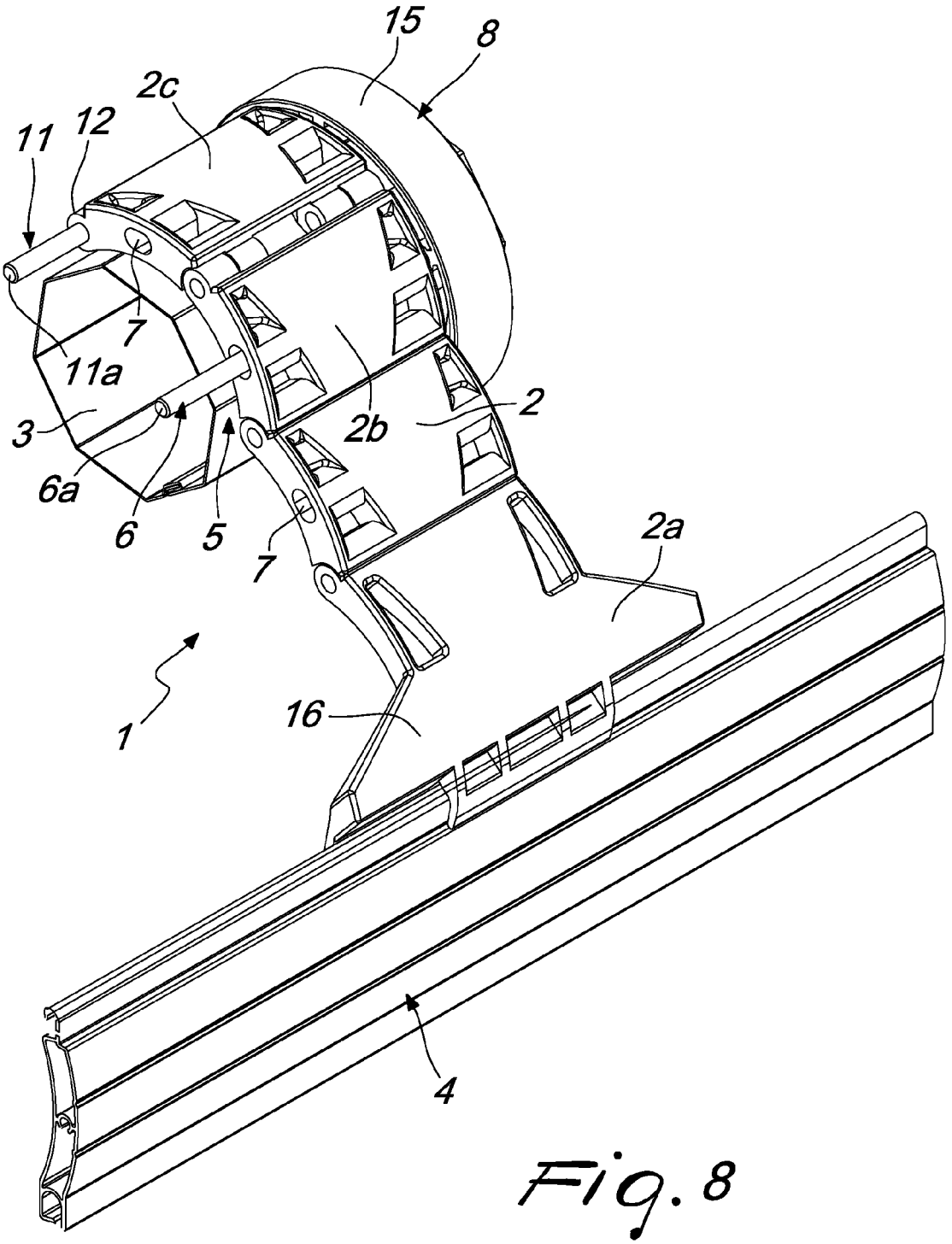

Fig. 8

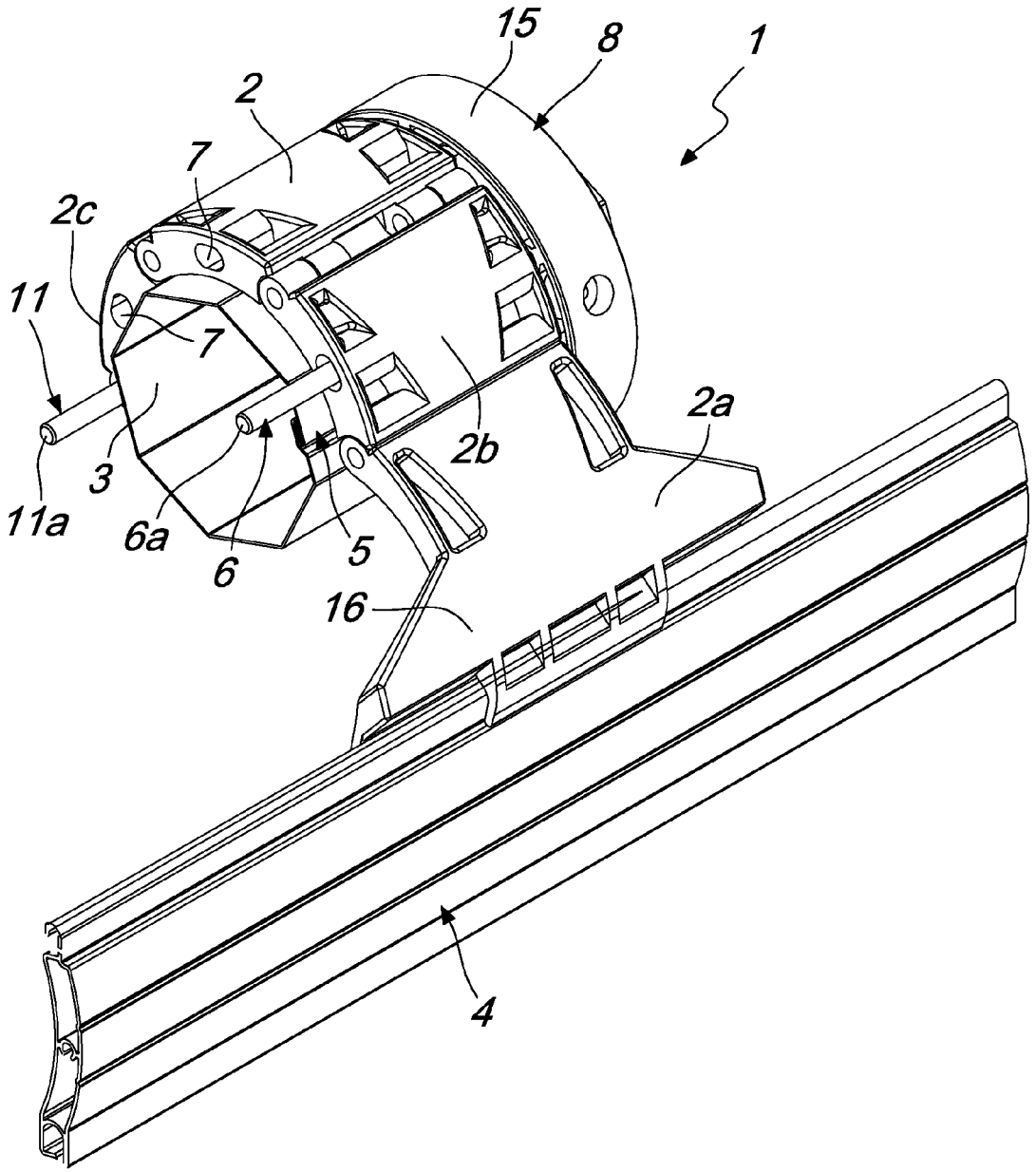

Fig. 9

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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