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(54) **DEVICE FOR RETURN ACTIONING A HANDLE**

(57) A device (1) for return actioning a handle (8) comprising:
- a body (2) with a central hole (20), to be mounted on a door (10);
- a driving disk (3), placed in said body (2) and having a central hole (30) apt to house a pin (11) connected to at least one handle (8) located on one side of the door (10), said driving disk (3) being able to rotate through a limited angle inside said body (2);
- a spring (4) interposed between said body (2) and the driving element (3), which acts on the latter to return said at least one handle (8);
- means (5, 24) apt to restrain said driving body (3) and said spring (4) to said body (2),
wherein said spring (4) is a planar axial coil spring housed in an annular seat (21) of said body (2), which can be applied completely outside the plane of the door, said hole (30) of the driving disk (3) being shaped so as to couple with said pin (11) or with a hub (80) of said at least one handle (8).

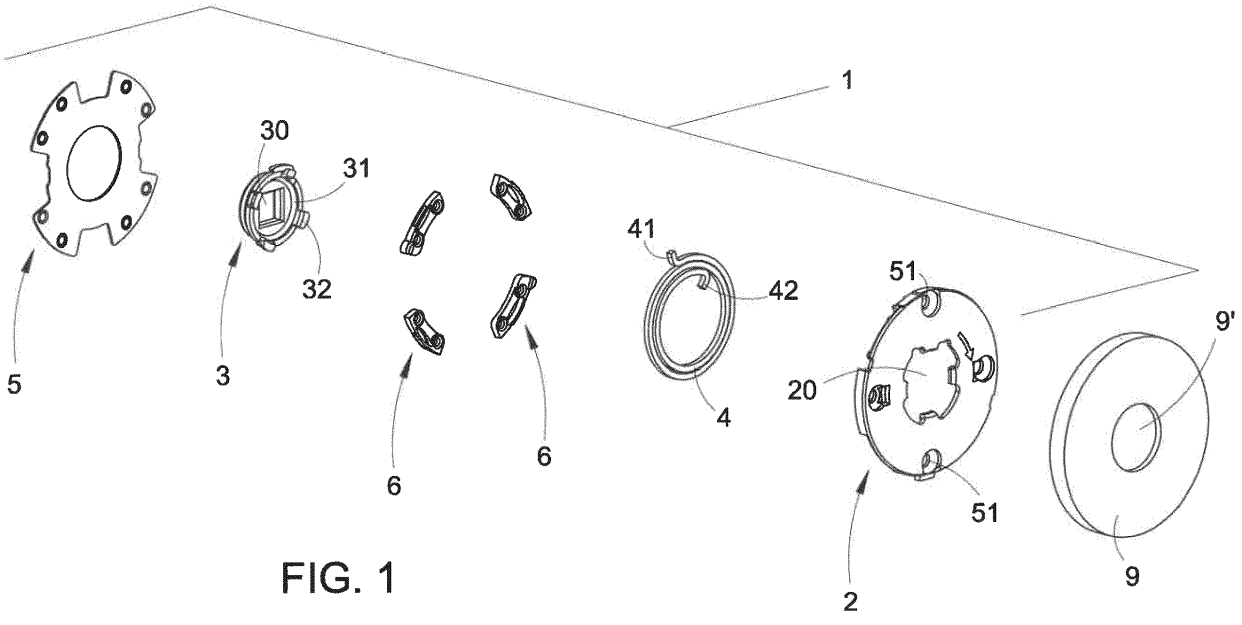


FIG. 1

EP 3 260 633 A1

Description

[0001] The object of the present invention is a device for return actioning a handle, with reduced overall dimensions.

[0002] Devices are known for return actioning a handle, in particular a handle which actuates a lock of the spring lock type, wherein a pawl is actuated by rotating the same handle.

[0003] When the user releases the handle, the latter is returned to the initial position by return actioning means (a spring or another functionally equivalent means) present in the lock, bringing back into the rest condition the pawl and the other members of the lock which connect the pawl to the handle.

[0004] The return actioning means placed in the lock are not always able to operate correctly, especially if the handle is rather large and/or heavy (for example because made in brass, zamak, and the like) and/or with a particular shape, or if the lock at rest does not maintain the handle in the correct horizontal position, for example due to errors of manufacture and/or design.

[0005] To avoid this disadvantage, a solution often used consists in applying to the exterior of the door, or of the lock, a mechanism provided with return spring and elements of positioning, housed inside a covering cap or rose.

[0006] This solution, although valid from the functional viewpoint, to the problem of returning and maintaining the handle in rest position (normally horizontal) determines a considerable projection with respect to the plane of the door, also constituting an element of hindrance.

[0007] Therefore this solution is not well accepted by the public and/or by interior designers, who would prefer to limit, above all for aesthetic reasons, the overall dimensions of projecting bodies with respect to the plane of the door.

[0008] WO 2013/050915 A1 describes a device for return actioning a handle which has to be mounted beforehand on the hub 4 of the handle, whereto it is attached by means of a Seeger 22, and subsequently attached to the door. Only the peripheral edge 14' of the flat inner surface 14 of a plate 10 of the device abuts against the outer surface of the door, while the remaining part of the plate 10, such as the guide collar 30 for the limit stop element 20, is housed in a special seat 100 obtained by widening the standard hole provided in the door with the tool shown in Figures 3 and 4.

[0009] The European patent EP 2333202, in the name of the same Applicant OLIVARI B. S.P.A., proposes a device of flattened shape for return actioning a handle, whose part that projects with respect to the plane of the door has a reduced thickness, such as to be able to be housed in a covering cap or rose (which is normally used to cover the hole for the passage of the square pin of the handle) of the thickness of a few millimetres, approximately 5.

[0010] In order to reduce the part projecting from the plane of the door, the device according to EP 2333202 has the section with the return spring housed in the thickness of the door.

[0011] This requires additional machining operations to widen the hole passing in the thickness of the door, normally provided for the housing of the square pin for actuation of the handle.

[0012] The object of the invention is that of perfecting the device according to the aforementioned European patent, making it further flattened and of such reduced thickness to be able to be placed almost completely outside the plane of the door, being housed completely and conveniently inside said covering rose of the thickness of approximately 5 mm.

[0013] Another object of the invention is that of providing such a device for return actioning of a handle that does not require additional machining operations of the hole of passage of the square pin formed in the thickness of the door.

Yet another object of the invention is that of providing such a device which is simple and easy to mount.

[0014] These and other objects are achieved by the return actioning device for a handle which has the features of the appended independent claim 1.

[0015] Advantageous embodiments of the invention are stated in the dependent claims.

[0016] Substantially, the device for return actioning a handle according to the invention comprises:

- a body with central hole, to be applied to a door;
- a driving disk placed in said body and having a central hole apt to receive a pin connected to at least one handle placed at one side of the door, said driving disk being able to rotate through a limited angle inside said body;
- a spring interposed between said body and the driving disk, which acts on the latter to return said at least one handle;
- means apt to restrain said driving disk and said spring to said body,

wherein said spring is an axial planar coil spring housed in an annular seat of said body, which can be applied completely outside the plane of the door, said hole of the driving disk being shaped so as to couple with said pin or with a hub of said at least one handle.

[0017] Further features of the invention will be made clearer by the following detailed description, referred to one of its embodiments purely by way of a non-limiting example, illustrated in the accompanying drawings, in which:

Figure 1 is an exploded perspective view of a device for return actioning a handle according to the invention;

Figure 2 is an exploded view like that of Figure 1 taken from the opposite side;

Figures 3 a and 3b are plan views of the device ac-

cording to the invention, respectively from the outer side and from the inner side;
Figure 3c is a plan view of the device without bottom, taken from the inner side;
Figure 3d is a median sectioned view of the device according to the invention complete with covering rose;
Figure 4 shows schematically an exploded view of a portion of door equipped with two devices according to the preceding drawings;
Figure 5 shows schematically the portion of door of Figure 4 sectioned along a horizontal plane V-V to show two devices of the preceding drawings assembled and attached to the door and to the handles;
Figure 6 is an exploded view wholly similar to that of Figure 4 showing different means of attachment of the devices to the door;
Figure 7 is a sectioned view similar to Figure 5, showing the different attachment to the door with the means shown in Figure 6;
Figure 8 shows a different embodiment of the driving disk apt to couple with the hub of a handle, partially shown in the same drawing;
Figure 9 is a median sectioned view, like that of Figure 3d, of the device according to the invention provided with the driving disk of Figure 8;
Figure 10 is a sectioned view similar to Figure 5, showing two devices according to Figure 9 assembled and attached to the door and to handles like that of Figure 8.

[0018] In the drawings listed above, identical or similar elements are identified by means of the same reference numerals.

[0019] Referring to Figures 1 and 2, the device for return actioning of a handle according to the invention, denoted overall by reference numeral 1, comprises substantially the following components, which will be described in greater detail here below:

- a metal body 2, in particular in zamak, of considerably reduced thickness, approximately 3 mm, apt to contain all the other components of the device and to be placed against the outer surface of a door 10 (Figure 4); the body 2 has a discoid shape and has an appropriately shaped central hole 20;
- a driving disk 3, advantageously in plastic material, but can also be made in metal, being housed partially in the body 2 and having a square hole 30 apt to receive and to actuate a square pin 11 (Figure 4) which connects one to the other two handles 8 placed at the opposite sides of the door 10;
- a planar coil steel spring 4 placed inside the body 2 and acting on the driving disk 3 to return into position a handle 8 after actuation;
- a bottom 5, preferably in steel, apt to lock the driving disk 3 in the body 2;
- elements in plastic 6 interposed between the body 2 and the bottom 5 for a correct attachment between these elements, so as to avoid a metal-metal contact, said elements 6 having a ratchet on a flexible part projecting slightly beyond the outer profile of the body 2 to allow the snap-locking of an external covering rose 9, in metal material (or also plastic), advantageously provided with a bushing in plastic material 55 (for example nylon) to reduce the friction between the end of the handle 8 and the rose 9 during the rotation of the handle. In the embodiment illustrated, two of said elements in plastic 6 have respective reference radial teeth 60 apt to be inserted in corresponding seats approximately opposite 90 (only one visible in Fig. 2), provided inside the perimeter edge of the rose 9, for a correct positioning and compensation of play of the rose.

[0020] The discoid body 2 has a built-in annular seat 21, which develops around the central shaped hole 20, apt to house the spring 4.

[0021] The perimeter edge around the annular seat 21 has four raised sections 22, which alternate with the same number of depressed sections 23, placed approximately opposite one to the other.

[0022] In the depressed sections 23 respective pairs of pegs 24 are provided, apt to be inserted in appropriate holes 16 provided in the elements in plastic 6 to lock them in position and in corresponding holes 15 provided in the bottom 5 to keep assembled the entire device following riveting, deformation with heat or gluing.

[0023] The bottom 5 has a substantially cloverleaf shape, with an alternation of radial projections 13 and recesses 14, which reproduce, respectively, the shape of the depressions 23 and of the reliefs 22 provided on the perimeter edge of the body 2, so as to allow a perfect closure of the device.

[0024] In the shaped hole 20 of the discoid body 2 four projections 25 are provided, placed substantially at 90° one from the other and oriented radially towards the interior of the hole 20, so that between adjacent projections a seat 26 is formed, bordered by adjacent projections 25 and by an arc of circle extending on an angle of approximately 60°, sufficient to allow a rotation of 36° for the driving disk 3.

[0025] The four radial projections 25 have an L shape, that is they have a tooth 25' bent at 90° towards the interior.

[0026] The driving disk 3 has an annular edge 31 wherefrom four teeth 32 project axially, also preferably with an L shape.

[0027] The four divisions and the L shape determine an increase in the surfaces of contact between body 2 and driving disk 3, better distributing the forces and obtaining a greater solidity of the system.

[0028] In the assembling operations, the annular edge 31 of the driving disk 3 positions on the projections 25 and on the teeth 25' of the projections 25, while the teeth 32 projecting from the annular edge 31 go to be placed

in the hole 20, and in particular in the seats 26 bordered by adjacent projections 25, allowing a rotation of a limited angle for the driving element 3 and a correct positioning at rest.

[0029] The spring 4, which is housed in said annular seat 21 of the discoid body 2, has one end 41 directed towards the exterior, which goes to engage in one of two recesses 27 provided at the sides of one of said reliefs 22 of the discoid body 2, and one end 42 directed towards the interior, which goes to engage one of said teeth 32 of the driving disk 3, differently shaped for the purpose.

[0030] The object of having two recesses 27 is that of being able to mount the spring 4 so as to exert its force of return on the driving disk 3 in one direction or in the other. The situation illustrated in the accompanying drawings, in particular in Figures 3a-3c, is that of a right handle, wherein the arrow F shown in Figure 3a indicates the direction of rotation of the handle which further loads the spring 4 which, on release, produces its return into the rest position.

[0031] On the side opposite to the edge 31 with the projections 32, the driving disk has a tang of substantially cylindrical shape, or better tubular, 33, as can be seen more clearly in the section of Figure 3d.

[0032] The tang 33, which contains the hole 30 for the passage of the square pin 11 for actuation of the handles, has a small external diameter, of the order of 15-18 mm, such as to be able to be housed in the standard hole 18 provided in the door for the traversing of the square pin 11 (Figure 4) without having to require additional machining operations.

[0033] The projection of the tang 33 beyond the bottom 5 is also considerably reduced, for example not greater than 4 mm, so that it can be comfortably housed in the mouth of the hole 18 and not interfere with the lock in doors of reduced thickness.

[0034] Such reduced thicknesses of the return actioning device for handle according to the invention have however been able to be obtained thanks to the particular structure and configuration of the body 2 with the annular seat 21 for housing of the planar coil spring 4, formed conveniently with 1.5 mm square wire.

[0035] It was thus possible to produce a device which can be placed virtually completely outside the plane of the door, without producing an appreciable bulk and such as to be able to be housed comfortably in the standard covering rose, which was provided in the patent EP 2333202 to cover only the annular edge of the body of containment of the mechanism, which was placed outside the door, while the components of the same, including the return spring, were housed in a cylindrical tang placed in the thickness of the door, where it was necessary to form beforehand a widening of the hole of passage of the square pin.

[0036] Referring to Figure 4, the device is attached to the door 10 by inserting it on the projecting part of the square pin 11 and fastening it by means of screws 50 passing in holes 51 provided at the raised sections 22 of the perimeter edge of the metal body 2.

[0037] The device is then covered by the rose 9, which snap-hooks thanks to the slight projection of the elements in plastic 6 beyond the outer profile of the body 2, which act as elastic elements of interference compensating the play. The reference teeth 60 of the elements in plastic 6 and a tab 61 of the body 2, apt to be inserted in a corresponding notch 91 of the rose, allow an immediate and correct positioning of the rose, which can be easily disassembled and reassembled for maintenance on the door.

[0038] Subsequently the handle 8 is applied on the square pin 11, placing its end in the hole 9' of the rose 8 after interposition of the anti-friction bushing in plastic 55. The attachment of the handle 8 to the square pin 11 takes place by means of a dowel 56.

[0039] In the exploded view of Figure 4 and in the section of Figure 5 two handles 8 are shown, each of which being associated with a return actioning device 1 according to the invention.

Obviously in the case wherein a single handle 8 is mounted on the door 10 only one return actioning device will be provided. In this case the hole 18 provided in the door to accommodate the square pin 11 will not be through and the square pin will project only on one side of the door.

[0040] In a simplified embodiment of the invention, the body 2 can be made in plastic material, with the elements in plastic 6 integrated, even if in this case the rigidity of the whole would decrease.

[0041] The embodiment according to Figures 6 and 7 is substantially identical to the one previously illustrated, barring the fact that for the attachment of the two return actioning devices at the opposite sides of the door 10, in addition to a respective pair of screws 50 which in this case perform only the function of positioning of the return actioning devices, there are provided, on one side, a pair of tie rods 70, passing in corresponding holes 71 formed in the thickness of the door 10, and on the other side a pair of threaded bushes 72 in which the tie rods 70 are screwed or a tie rod and a counter tie rod can be provided per side.

[0042] The embodiment according to Figures 8-10 differs from the preceding ones solely due to the fact that the driving disk 3 is practically without the tang 33 and has a central hole 30 shaped in such a way as to couple with a hub 80 of the handle 8, having in this case two opposite flat walls 81.

According to this embodiment the driving disk 3 is actuated directly by the handle 8, rather than by the square pin 11, and has such a thickness as to be contained completely in the body 2, as shown in Figure 9, and as to remain completely outside the plane of the door, inside the rose 9, as shown in Figure 10.

[0043] From what is disclosed the advantages of the device for return actioning a handle according to the invention appear clear, which can be attached to the outside of the plane of the door without then requiring addi-

tional work on the same door, determining a minimal projection such as to be able to be accommodated in a standard covering rose.

[0044] The description given previously and the measurements given refer to a device for a door with standard handle and lock.

Should the lock and the handle be oversized, the dimensions of the device would increase proportionally reaching in any case the objects preset and remaining within the scope of the inventive concept of the invention.

[0045] Naturally the invention is not limited to the particular embodiments described previously and illustrated in the accompanying drawings, but numerous detail changes may be made thereto, within the reach of the person skilled in the art, without thereby departing from the scope of the same invention, as defined in the appended claims.

Claims

1. Device (1) for return actioning a door handle (8), comprising:

- a body (2) with a central hole (20), to be mounted on a door (10);
- a driving disk (3), placed in said body (2) and having a central hole (30) apt to receive a pin (11) linked to at least one handle (8) located on one side of the door (10) and passing in a hole (18) provided in the door (10), said driving disk (3) being able to rotate through a limited angle inside said body (2);
- a spring (4) interposed between said body (2) and the driving element (3), which acts on the latter to return said at least one handle (8);
- means (5, 24) apt to restrain said driving disk (3) and said spring (4) to said body (2),

characterised in that said spring (4) is an axial planar coil spring housed in an annular seat (21) of said body (2), which spring, during use, is placed completely outside the plane of the door, without requiring further processing of said hole (18) of the door, said hole (30) of the driving disk (3) being shaped so as to couple with said pin (11), or with a hub (80) of said at least one handle (8).

2. Device according to claim 1, wherein said hole (30) of the driving disk (3) couples with the hub (80) of the handle and said driving disk has a thickness such as to be housed completely inside said body (2) placed outside the plane of the door.

3. Device according to claim 1, wherein said hole (30) of the driving disk (3) couples with the pin (11) and said driving disk has a cylindrical tang slightly projecting beyond the thickness of the body (2) and has such dimensions as to be housed in a hole (18) provided in the door (10) for the passage of said pin (11), without further processing.

4. Device (1) according to any one of claims 1 to 3, **characterised in that** said hole (20) of the body (2) is a shaped hole, in which a plurality of radial projections (25) of the body (2) are provided, said driving element (3) having an annular edge (31) resting on said radial projections (25), and teeth (32) inserted in seats (26) between adjacent radial projections (25) which, abutting with said projections (25), determine the limited angle of rotation of the driving disk (3) and repositioning at rest.

5. Device 1 according to claim 4, **characterised in that** said radial projections (25) provided in the hole (20) of the body (2) have a tooth (25') bent at 90° towards the interior, on which said annular edge (31) of the driving disk (3) goes to rest.

6. Device 1 according to claim 4 or 5, **characterised in that** said planar coil spring (4) has one end (41) turned outwards in engagement with a recess (27) provided in the body (2), and one end (42) turned inwards in engagement with one of said teeth (32) of the driving body (3).

7. Device (1) according to claim 1, wherein said fastening means comprise pegs (24) provided in depressions (23) spaced at intervals by relief portions (22) of a peripheral edge of the body (2), and a closing bottom (5) which engages with said pegs (24).

8. Device (1) according to any one of the preceding claims, **characterised in that** said body (2) and said bottom (5) are in metallic material, and elements (6) in plastic material are interposed between said body (2) and said bottom (5), apt to prevent a metal-metal contact.

9. Device (1) according to any one of claims 1 to 7, wherein said body (2) is in plastic material and elements (6) in plastic material are made integral therewith.

10. Device (1) according to claim 8 or 9, **characterised in that** a covering element or rose (9) is provided, snap-fastened on said body (2) and restrained by elastic interference with radial projections provided on said elements (6) in plastic material, carrying reference radial teeth (60).

11. Device according to any one of the preceding claims, wherein, in a standard configuration, said body (2) containing the spring (4) and housing the driving element (3), apt to be placed externally to the surface of the door (10), has a thickness of about 3 mm, and

said optional tang (33) of the driving element (3) has a diameter of about 15-18 mm and projects by about 4 mm from the body (2).

12. Device (1) according to any of claims 7 to 11, **characterised in that** on said relief parts (22) of the perimeter edge of said body (2), holes (51) are provided for the passage of screws (50) for securing the device (1) to the door (10).

13. Device (1) according to any one of claims 7 to 11, **characterised in that** on said relief parts (22) of the peripheral edge of the body (2), holes (51) are provided for the passage of a pair of tie rods or of corresponding threaded bushes (72) for the attachment of two devices (1) arranged at opposite sides of the door (10), said tie rods (70) passing in corresponding holes (71) provided in the thickness of the door (10).

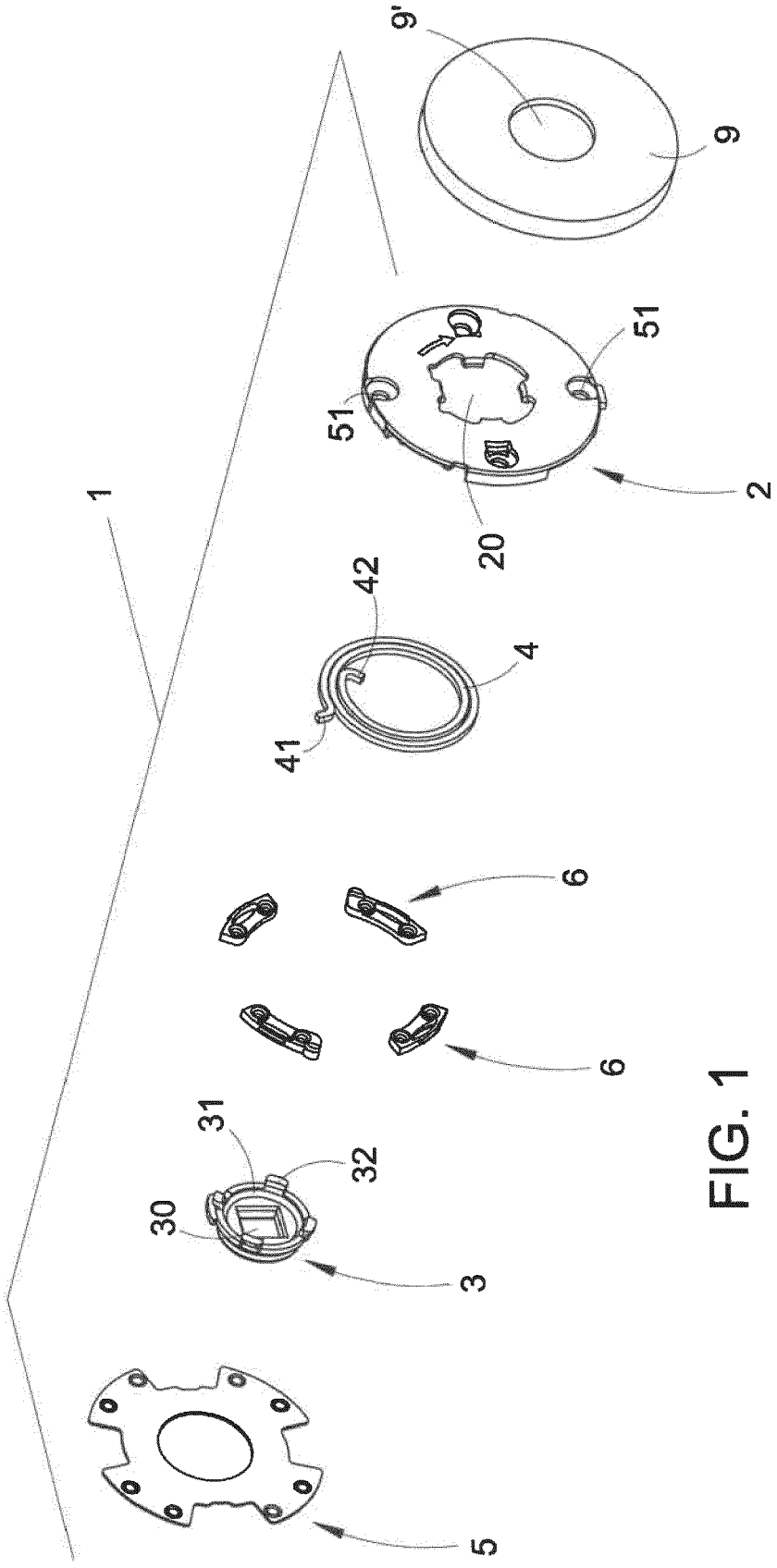
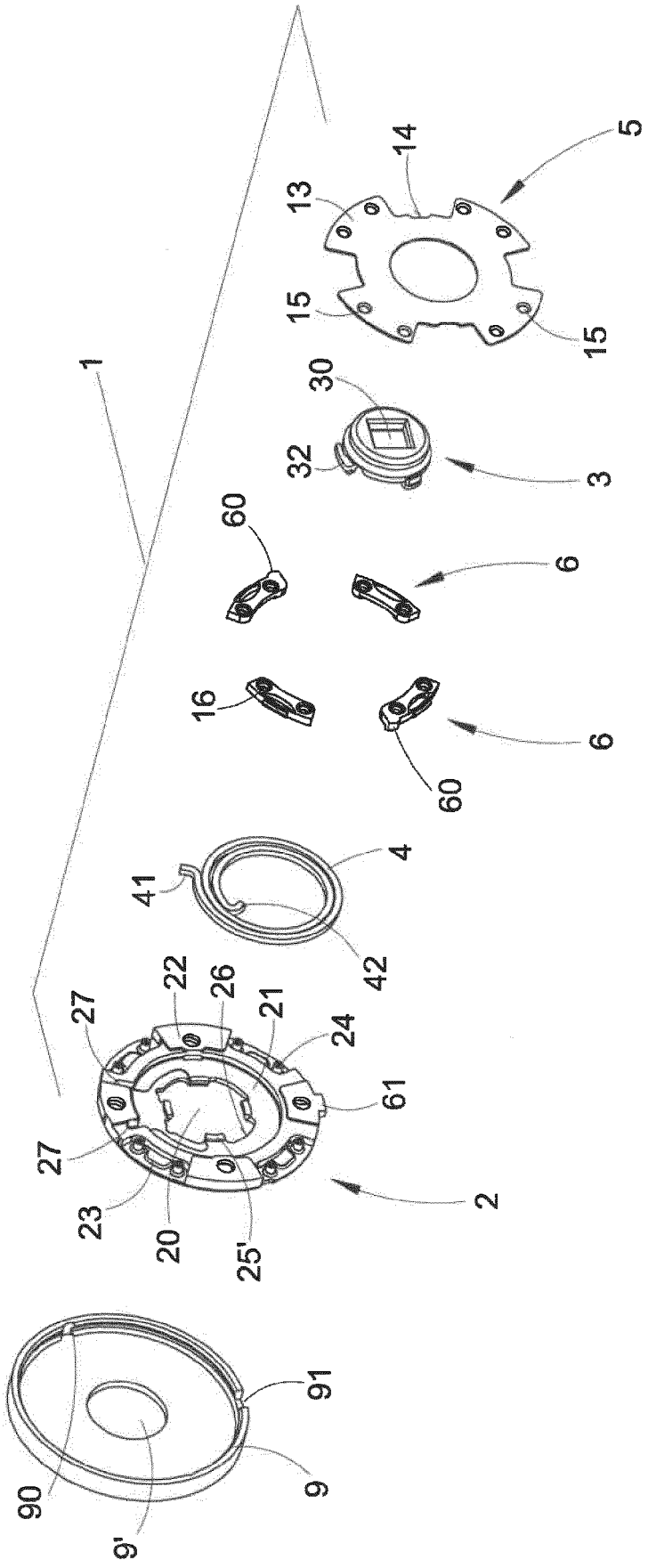


FIG. 1

FIG. 2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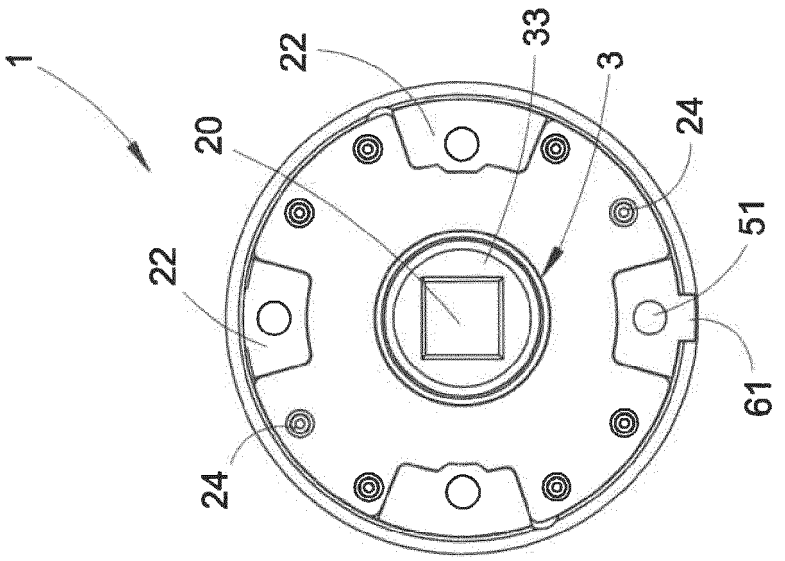

FIG. 3b

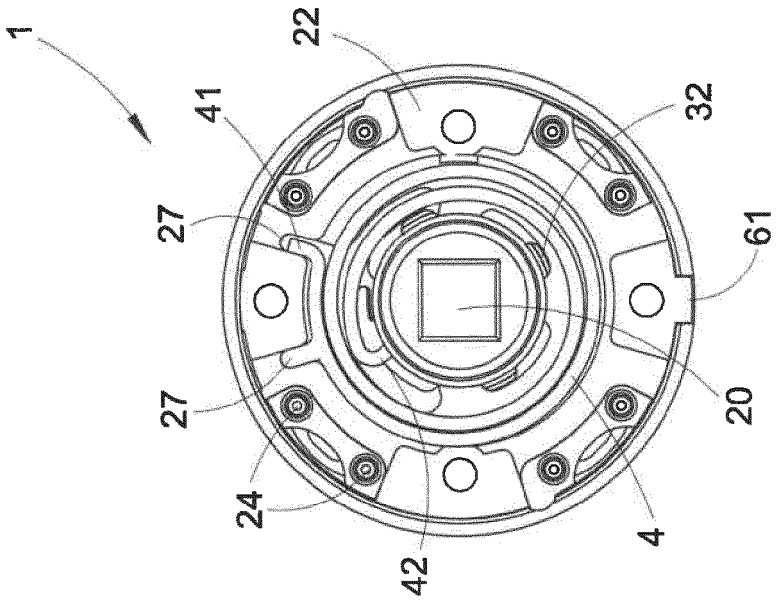

FIG. 3c

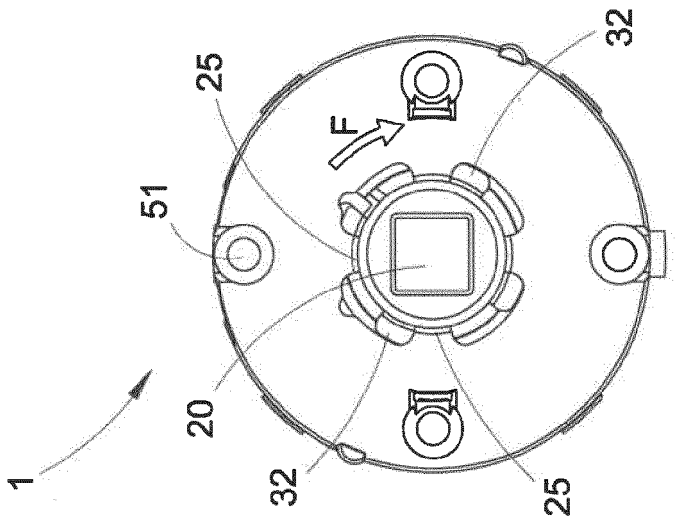

FIG. 3a

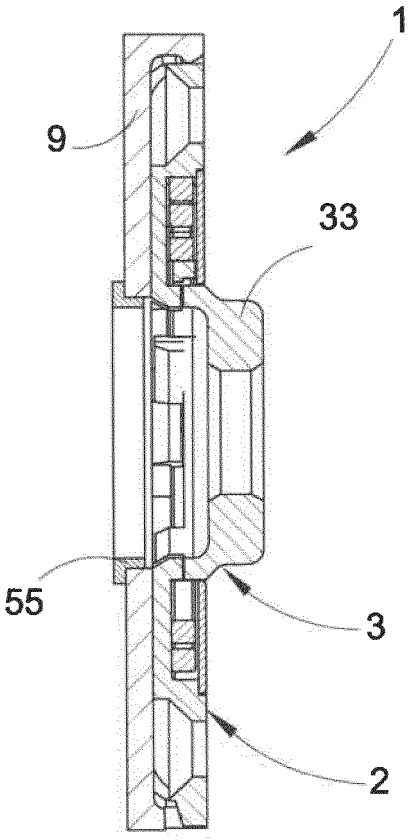

FIG. 3d

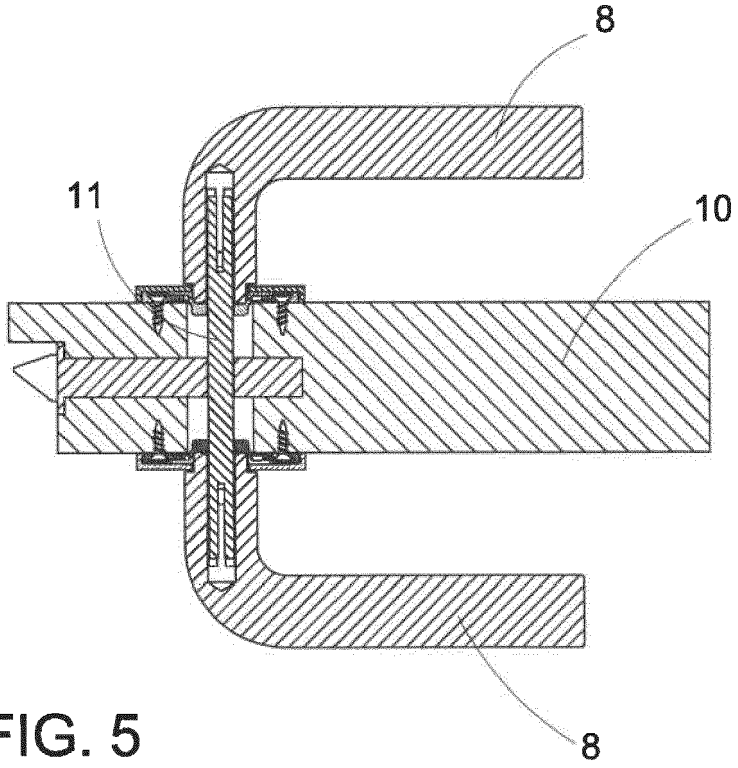

FIG. 5

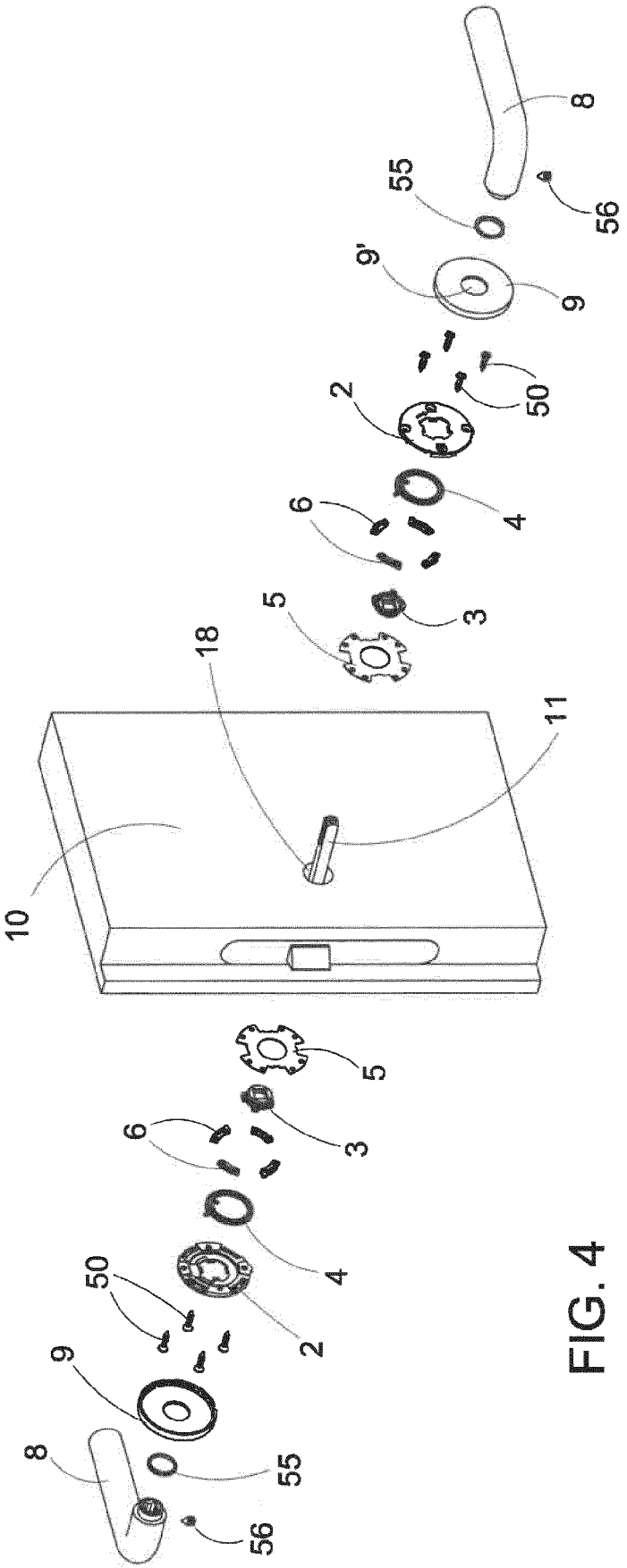

FIG. 4

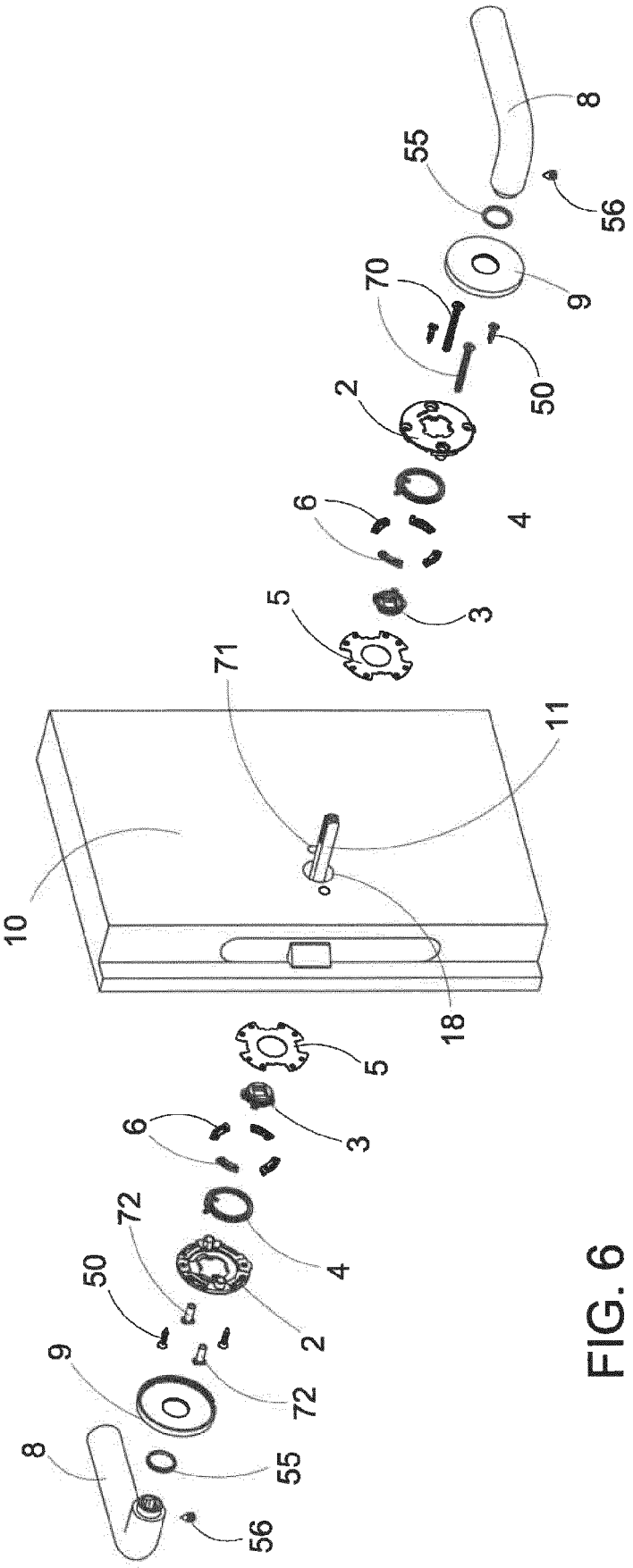

FIG. 6

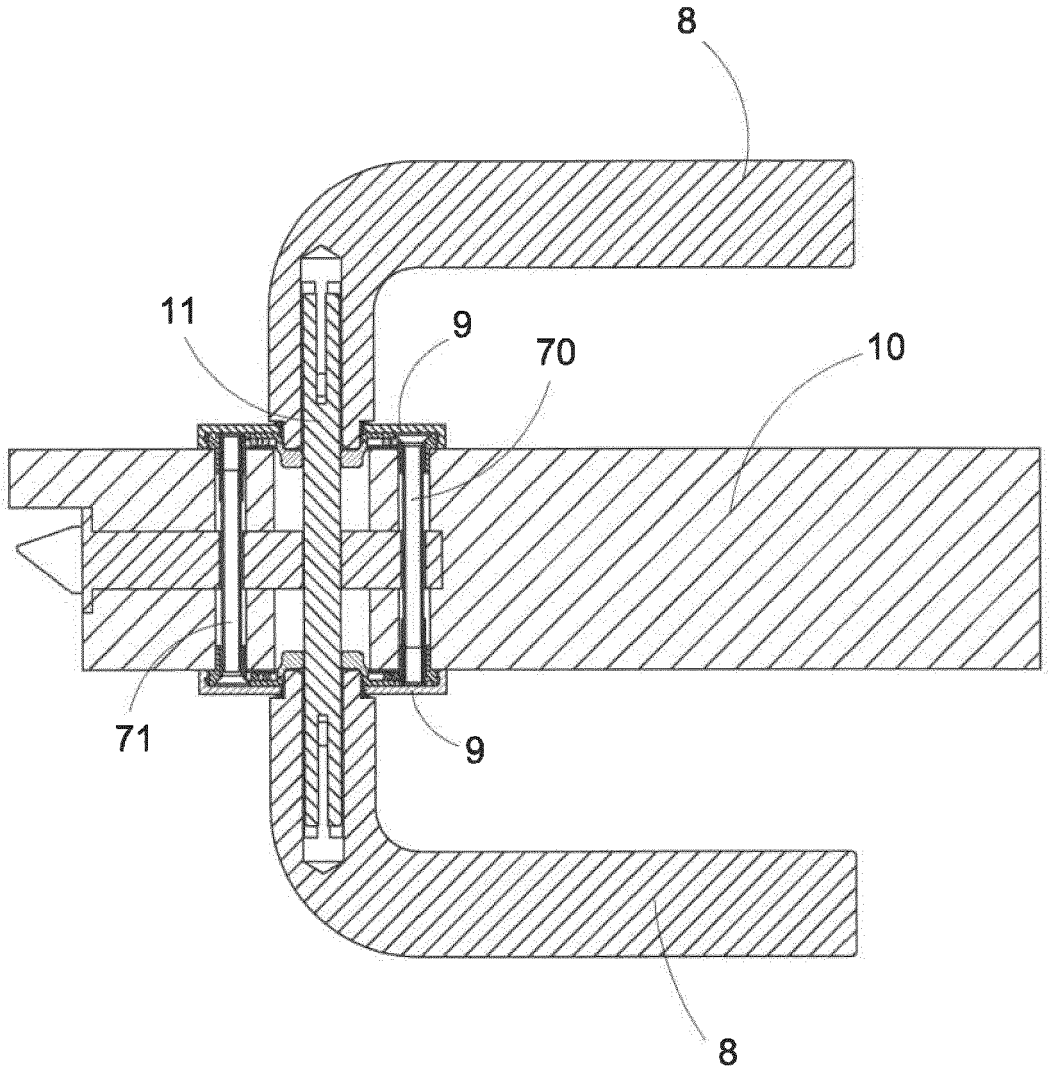

FIG. 7

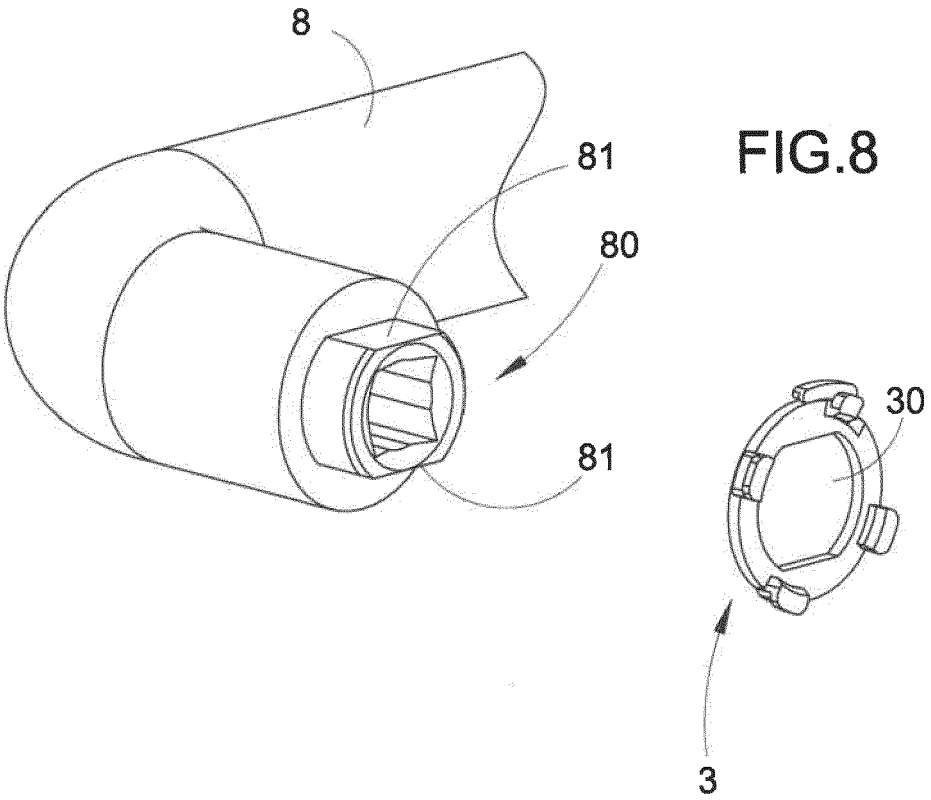

FIG.8

FIG. 9

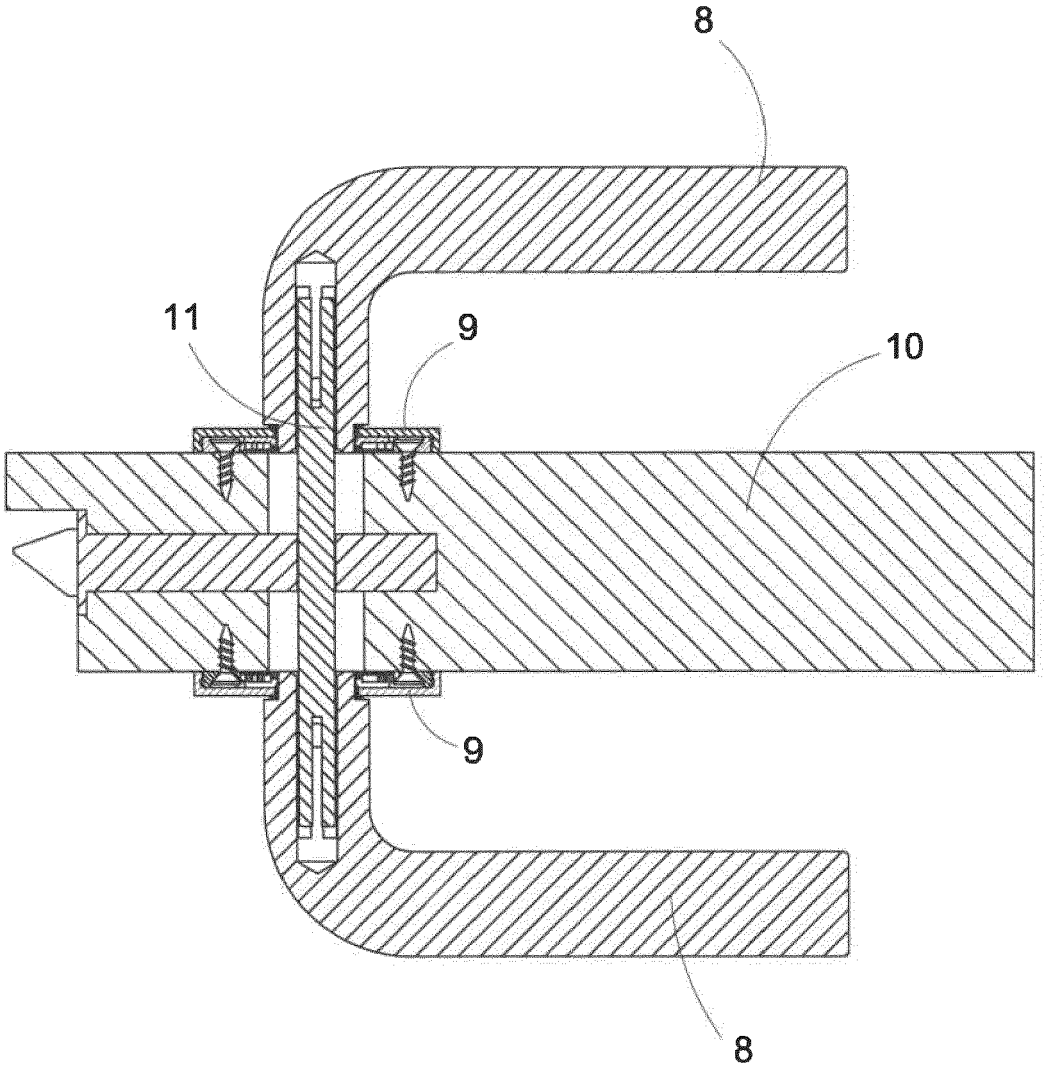

FIG. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 17 17 7084

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	EP 2 966 243 A1 (HOPPE AG [IT]) 13 January 2016 (2016-01-13) * the whole document *	1-13	INV. E05B3/06 E05B15/04
X A	WO 2013/050915 A1 (MANITAL S R L [IT]) 11 April 2013 (2013-04-11) * figures 1, 4 *	1-3 4-13	
X A	DE 20 2005 004381 U1 (HOPPE AG ST MARTIN [IT]) 25 May 2005 (2005-05-25) * abstract *	1 2-13	
X A	US 5 125 696 A (ROBIDA JAMES E [US] ET AL) 30 June 1992 (1992-06-30) * column 10, line 46 - column 12, line 57; figures 8, 9 *	1 2-13	
			TECHNICAL FIELDS SEARCHED (IPC) E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	17 October 2017	Cruyplant, Lieve

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 17 17 7084

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17-10-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2966243 A1	13-01-2016	CN 205063543 U	02-03-2016
		DE 102014109614 A1	14-01-2016
		EP 2966243 A1	13-01-2016
WO 2013050915 A1	11-04-2013	NONE	
DE 202005004381 U1	25-05-2005	AT 455218 T	15-01-2010
		DE 202005004381 U1	25-05-2005
		DK 1703044 T3	17-05-2010
		EP 1703044 A2	20-09-2006
		ES 2338893 T3	13-05-2010
		SI 1703044 T1	31-05-2010
US 5125696 A	30-06-1992	CA 2053167 A1	13-04-1992
		JP 2504646 B2	05-06-1996
		JP H04231566 A	20-08-1992
		PH 30610 A	31-07-1997
		US 5125696 A	30-06-1992
		ZA 9108094 B	29-07-1992

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2013050915 A1 **[0008]**
- EP 2333202 A **[0009] [0010] [0035]**