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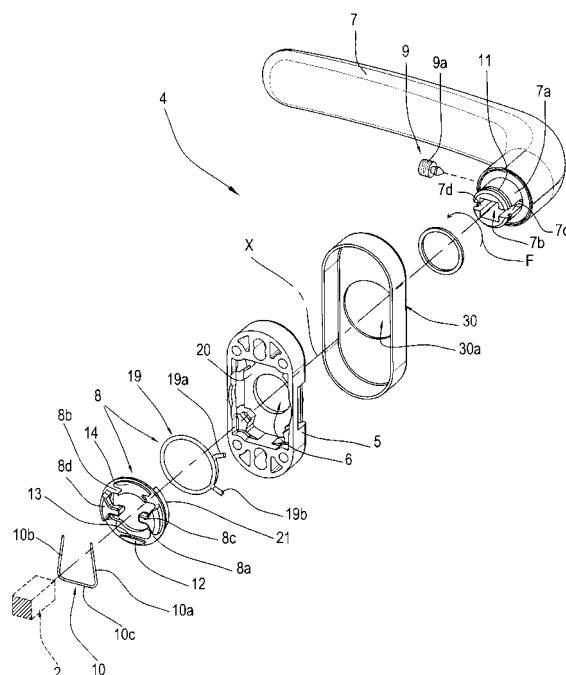
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(54) **Handle for door or window frames**

(57) A handle for door or window frames comprises at least a rotatable operating shaft (2) with a square cross-section, exiting a surface (3) of the door or window frame (1); the handle (4) comprises: a body (5) for connection to the surface (3) of the door or window frame (1) and having a through-opening (6) engaged by the shaft (2); a handgrip (7) which can be coupled in a matching fashion to the operating shaft (2), so that when the handgrip (7) is rotated about an axis (X) coinciding with the square shaft (2) the configuration of the door or window frame (1) is changed from closed to open; elastic means (8) positioned in the body (5) and designed to allow handgrip (7) positioning in a predetermined position corresponding to the door or window frame (1) closed configuration; means (9) for stably joining the handgrip (7) to the square shaft (2); means (10) for releasable axial retention of the handgrip (7) on the square shaft (2), located at the elastic means (8) and acting on the end portion (7a) of the handgrip (7), where the handgrip (7) is coupled to the square shaft (2), so as to stably hold the handgrip (7) on the shaft (2) irrespective of the presence of the stable joining means (9).

FIG.1



Description

[0001] The present invention relates to a handle for door or window frames, in particular a handle for "interior" door or window frames.

[0002] Handles for door or window frames, in particular for door or window frames made of metal, wood and synthetic material and the like, for interiors, such as doors separating rooms, are structurally simplified, in terms of their components, compared with handles "for exteriors" (such as known Cremone bolt handles), since the drive components are almost always already housed in the door or window frame, from which there exits, from one or both surfaces of the door or window frame, simply an operating shaft which normally has a square cross-section.

[0003] Therefore, these handles basically comprise:

- a body for connection to the outer surface of the door or window frame or to the support of a key lock on the door or window frame;
- a handgrip, passing through an opening in the body, so that it can be coupled by means of its end portion with matching seat to the drive shaft, meaning that by operating the handgrip the door or window frame can be opened and closed.

[0004] The handgrip is secured to the shaft, to prevent the handgrip from slipping off along the axis of the shaft, by connecting means consisting of a grub screw which is screwed into a radial through-seat in the handgrip and makes contact with a surface of the shaft.

[0005] The following may be added to the above-mentioned basic elements:

- a unit for predetermined positioning of the handgrip coupled to the shaft and
- spring means for returning the handgrip to a predetermined position which normally corresponds to the door or window frame closed configuration.

[0006] The handgrip positioning unit is housed in the body and may consist, in one of the prior art solutions, of a circular, ring-shaped element, with a pair of opposite radial projections extending towards the inside of the ring. During engagement with the handgrip, these projections engage two diametrically opposed longitudinal through-openings or grooves made on the end of the handgrip with the square cross-section: in this way the ring is rendered integral with the handgrip.

[0007] The spring means are, in turn, inserted and connected respectively between the inner surface of the body and the positioning unit: in this way, rotation of the handgrip (corresponding to opening the door or window frame) and of the ring compresses the spring means which, once the handgrip is released by the user, allows the handgrip to move upwards again by acting on the ring.

[0008] Finally, another element which may be present

in the handle may be a cover applicable on the body and held on it by contact with the handgrip when it is subsequently fitted to achieve a handle body colour and finish similar to the handgrip.

[0009] This handle structure has proved reliable over time, except for the relatively low locking safety of the handgrip on the shaft with square cross-section. Basically, frequent use of the handgrip or incomplete application of the locking grub screw (even due to handgrip changes by the user) may result in the handgrip falling off, damaging both the handgrip and the floor below.

[0010] The aim of the present invention is therefore to overcome the above-mentioned disadvantages by providing a handle unit which allows a high degree of safety to be maintained for the handle unit, and in particular for the handgrip, irrespective of the presence of fixing means for it, without affecting the basic structure of the handle unit and possibility of substituting or removing the handgrip when necessary.

[0011] Accordingly, the present invention achieves said aim with a handle for door or window frames comprising at least a rotatable operating shaft, with a square cross-section, exiting a surface of the door or window frame; the handle comprising: a body for connection to the surface of the door or window frame and having a through-opening engaged by the shaft; a handgrip which can be coupled in a matching fashion to the operating shaft, so that when the handgrip is rotated about an axis coinciding with the square shaft the configuration of the door or window frame is changed from closed to open; elastic means positioned in the body and designed to allow handgrip positioning in a predetermined position corresponding to the door or window frame closed configuration; means for stably joining the handgrip to the square shaft; means for releasable axial retention of the handgrip on the square shaft, located at the elastic means and acting on the end portion of the handgrip, where the handgrip is coupled to the square shaft, so as to stably hold the handgrip on the shaft irrespective of the presence of the stable joining means.

[0012] The technical features of the invention, with reference to the above aims, are clearly described in the claims below and its advantages are more apparent from the detailed description which follows, with reference to the accompanying drawings which illustrate a preferred embodiment of the invention provided merely by way of example without restricting the scope of the inventive concept, and in which:

- Figure 1 is an exploded perspective view, with some parts cut away to better illustrate others, of a first embodiment of a handle for door or window frames in accordance with the present invention;
- Figure 2 is an exploded perspective view, with some parts cut away to better illustrate others, of a second embodiment of the handle for door or window frames in accordance with the present invention;
- Figure 3 is an exploded perspective view, with some

parts cut away to better illustrate others, of a third embodiment of a handle for door or window frames in accordance with the present invention;

- Figure 4 is a front view, with some parts cut away to better illustrate others, of the rear of the assembled handle from Figure 3;
- Figure 5 is a front view of the rear of the assembled handle from Figure 1;
- Figure 6 is a cross-section according to line VI - VI from Figure 5.

[0013] With reference to the accompanying drawings, and in particular Figures 1, 2 and 3, the handle, labelled 4 as a whole, is fitted, in particular, on door or window frames made of metal, wood and synthetic material and the like, for interiors, such as doors separating rooms.

[0014] These door or window frames, labelled 1 in Figure 6, of the known type and only illustrated with a dashed line, comprise drive components designed to close and respectively open the door or window frame 1.

[0015] These components have at least a rotatable operating shaft 2, with a square cross-section, exiting a surface 3 of the door or window frame 1.

[0016] The shaft with square cross-section is also illustrated with a dashed line, since it is of the known type and is not strictly part of the present invention.

[0017] The handle 4 comprises:

- a body 5 for connection to the outer surface 3 of the door or window frame 1 and having a through-opening 6 partly engaged by the shaft 2;
- a handgrip 7, passing through the opening 6 in the body 5, and coupled, by means of its end portion 7a having a matching seat 7b, to the operating shaft 2, so that when the handgrip 7 is rotated about an axis X coinciding with the square shaft 2 (see arrow F in Figure 1) the door or window frame 1 configuration is changed from closed to open;
- elastic means 8 positioned in the body 5 and acting between the body and the handgrip 7 in such a way as to allow handgrip 7 positioning in a predetermined position corresponding to the door or window frame 1 closed configuration;
- means 9 for stably joining the handgrip 7 to the square shaft 2, acting radially from the outside of the handgrip 7.

[0018] In addition, the handle 4 comprises means 10 for releasable axial retention of the handgrip 7 on the square shaft 2, positioned at the elastic means 8 and acting on the end portion 7a of the handgrip 7, where the handgrip 7 is coupled to the square shaft 2, so as to keep the handgrip 7 stable on the shaft 2 irrespective of the presence of the stable joining means 9.

[0019] The above-mentioned stable joining means 9 normally consist of a threaded grub screw 9a which can be coupled radially in a seat 7s in the handgrip 7 (see Figure 6) then secures the latter through contact with the

square shaft 2.

[0020] In addition to the elements mentioned above, the handle 4 may also have a cover 30 for the body 5 which can be stably coupled on the body 5, and having a corresponding through-opening 30a for the handgrip 7; the handgrip 7 secures the cover 30 to the body 5 once fitted.

[0021] The above-mentioned elastic means 8 may comprise a contact element 8a positioned in the body 5 and connected to the end portion 7a of the handgrip 7 allowing handgrip 7 positioning in a predetermined position corresponding to the door or window frame 1 closed configuration.

[0022] As is clearly illustrated in Figures 1, 2 and 3, the above-mentioned contact element consists of a ring 8a with two opposite radial projections 8c and 8d extending inside the ring 8a. These projections 8c and 8d can engage two diametrically opposed longitudinal through-opening or grooves 7c, 7d made on the end 7a of the handgrip 7 with the square cross-section.

[0023] The retaining means 10 are elastically deformable and can be coupled, on opposite sides, to the cylindrical end portion 7a of the handgrip 7, and in a relative circumferential groove 11 on the end portion 7a.

[0024] More precisely, and in a first embodiment illustrated in Figures 1, 2, 5 and 6, the retaining means 10 are inserted between the contact element 8a and the surface 3 of the door or window frame 1 and are applied on a surface 8b of the contact element 8.

[0025] In an alternative embodiment illustrated in Figures 3 and 4, the retaining means 10 are inserted between the contact element 8a and the surface 3 of the door or window frame 1 and can be connected directly to the body 5.

[0026] Examining the technical details more closely, Figures 1, 2, 5 and 6 show how the retaining means may consist of a "U"-shaped elastic element 10 which can be connected to the surface 8b of the ring 8a opposite the surface 3 of the door or window frame 1.

[0027] The two legs 10a and 10b of the "U" can be coupled, snapping into position and on opposite sides, in the groove 11 in the cylindrical end portion 7a of the handgrip 7, allowing releasable axial retention (see Figure 6).

[0028] In more detail, the elastic element 10 has the legs 10a and 10b of the "U" extending in such a way that they converge with one another to elastically snap onto and clamp the end portion 7a at the groove 11.

[0029] Figure 6 clearly shows how the "U"-shaped elastic element 10 is stably connected on the ring 8a, which has:

- a lower block 12 projecting from its surface 8b and forming a channel 13 housing the connecting section 10c of the "U", and
- an upper projection 14 on which the two legs 10a and 10b of the "U" rest; the two legs 10a and 10b being retained by the two radial projections 8c and

8d of the ring 8a to prevent axial sliding or movement of the elastic element 10 during handgrip 7 fitting.

[0030] In Figures 3 and 4, the retaining means may consist of an inverted "U"-shaped elastic element 10' where the connecting section 10'a of the "U" and the open ends of the legs 10'b, 10'c of the "U" are angled in such a way as to form a bridge-shaped elastic element 10'.

[0031] Said elastic element configuration allows it to jut out from behind the contact ring 8a and connect directly to the body 5.

[0032] More precisely, the section 10'a and the ends of the legs 10'b, 10'c can be stably connected, by snapping into place, in corresponding seats or channels 15, 16 in the body 5, so as to allow elastic coupling, on opposite sides, of the two parallel legs 10'b, 10'c of the "U" in the groove 11 in the cylindrical end portion 7a of the handgrip 7, allowing its axial retention once fitted.

[0033] To allow greater retention of this elastic element 10, the angled ends of the legs 10'b, 10'c have an additional relative extension 17, 18, perpendicular to the ends, and opposite each other to form a lower connecting zone in the seat 16 in the body 5. As Figures 1, 2 and 3 clearly show, the elastic means 8 also comprise a spring for retuning the handgrip 7 to the door or window frame 1 closed position acting between the body 5 and the contact ring 8a.

[0034] Figure 1 shows a first version of the spring consisting of a wire spring 19 with an open circular shape.

[0035] The spring 19 is inserted between the contact ring 8a and the body 5 which has a seat 20 to house it. The spring 19 also has two radial projections 19a and 19b projecting outwards from its circumference, at the corresponding free ends, and making contact with two opposite surfaces of a ring 8a semi-circular inner bulge 21: in this way rotation of the handgrip 7 and the ring 8a compress the spring 19 which, as a result, generates a counterthrust when the pressure on the handgrip 7 ends, causing the handgrip to return to the closed position.

[0036] In Figure 2 the elastic means 8 comprise two wire springs 22, 23, each omega-shaped and inserted between the contact ring 8a and the body 5 having the relative seat 20 to house them.

[0037] The two springs 22, 23 are positioned opposite each other and their free projections make contact on both sides with the surfaces of corresponding opposite contact ring 8a semi-circular bulges 21, 21a: this allows the handgrip 7 return as described above with the difference that it is only one of the two springs 22 and 23 that is compressed, whilst the other is there to guarantee the same function even if the position of the handgrip 7 is inverted (right-hand turning or left-hand turning). In contrast, in Figures 3 and 4, the elastic means 8 comprise two helical springs 24, 25, inserted between the contact ring 8a and the body 5 having a relative seat 26 to house them.

[0038] In practice, the two helical springs 24, 25 are

positioned opposite each other to form a sort of ring in the body 5, and their free ends make contact on both sides with the surfaces of corresponding contact ring 8a radial bulges 8c, 8d: again, operation is as described for the two previous embodiments.

[0039] Therefore, the handle structured in this way achieves the preset aims, through the insertion in the handgrip connecting and positioning mechanism of a retaining element, already present and fitted in the handle set, designed to connect, in a releasable fashion, the handgrip on the body and on the square shaft even if the locking grub screw is not present, or if the grub screw, for various reasons, does not secure the handgrip to the shaft: thus preventing the handgrip from becoming detached.

[0040] Said device is economically acceptable, leaves the dimensions of the handle body unchanged and is already integrated with the body and the spring means during the pre-assembly step, therefore without additional operations for the fitter.

[0041] The invention described is suitable for many industrial applications and may be modified and adapted in several ways without thereby departing from the scope of the inventive concept. Moreover, all the details of the invention may be substituted by technically equivalent elements.

Claims

1. A handle for door or window frames, the door or window frame (1) comprising drive components designed to allow the door or window frame (1) to be closed and opened and the components comprising at least a rotatable operating shaft (2) with a square cross-section, exiting a surface (3) of the door or window frame (1); the handle (4) comprising at least:
 - a body (5) for connection to the outer surface (3) of the door or window frame (1) and having a through-opening (6) partly engaged by the shaft (2) ;
 - a handgrip (7), passing through the opening (6) in the body (5), and coupled, by means of its end portion (7a) having a matching seat (7b), to the operating shaft (2), so that when the handgrip (7) is rotated about an axis (X) coinciding with the square shaft (2) the door or window frame (1) configuration is changed from closed to open;
 - elastic means (8) positioned in the body (5) and acting between the body and the handgrip (7) in such a way as to allow handgrip (7) positioning in a predetermined position corresponding to the door or window frame (1) closed configuration;
 - means (9) for stably joining the handgrip (7) to the square shaft (N), acting radially from the out-

- side of the handgrip (7);
the handle (4) being **characterised in that** it also comprises means (10) for releasable axial retention of the handgrip (7) on the square shaft (2), positioned at the elastic means (8) and acting on the end portion (7a) of the handgrip (7), where the handgrip (7) is coupled to the square shaft (2), so as to keep the handgrip (7) stable on the shaft (2) irrespective of the presence of the stable joining means (9).
2. The handle according to claim 1, **characterised in that** the retaining means (10) are elastically deformable and can be coupled, on opposite sides, to the cylindrical end portion (7a) of the handgrip (7) in a relative circumferential groove (11) in the end portion (7a).
 3. The handle according to claim 1, wherein the elastic means (8) comprise a contact element (8a) positioned in the body (5) and connected to the end portion (7a) of the handgrip (7) to allow handgrip (7) positioning in a predetermined position corresponding to the door or window frame (1) closed configuration, **characterised in that** the retaining means (10) are inserted between the contact element (8a) and the surface (3) of the door or window frame (1) and are applied on a surface (8b) of the contact element (8).
 4. The handle according to claim 1, wherein the elastic means (8) comprise a contact element (8a) positioned in the body (5) and connected to the end portion (7a) of the handgrip (7) to allow handgrip (7) positioning in a predetermined position corresponding to the door or window frame (1) closed configuration, **characterised in that** the retaining means (10) are inserted between the contact element (8a) and the surface (3) of the door or window frame (1) and can be applied to the body (5).
 5. The handle according to claim 3, wherein the contact element consists of a ring (8a) with two opposite radial projections (8c, 8d) extending towards the inside of the ring (8a); the projections (8c, 8d) engaging two diametrically opposed longitudinal through-openings or grooves (7c, 7d) made on the end of the handgrip (7) with the square cross-section, the handle being **characterised in that** the retaining means consist of a "U"-shaped elastic element (10) which can be connected to the surface (8b) of the ring (8a) opposite the surface (3) of the door or window frame (1); two legs (10a, 10b) of the "U" coupling, on opposite sides, in a groove (11) in a cylindrical end portion (7a) of the handgrip (7) to allow its releasable axial retention.
 6. The handle according to claim 5, **characterised in that** the elastic element (10) has the legs (10a, 10b) of the "U" extending in such a way that they converge with each other, in practice elastically clamping the end portion (7a) at the groove (11).
 7. The handle according to claim 5, **characterised in that** the "U"-shaped elastic element (10) is stably connected on the ring (8a) which has a lower block (12) projecting from its surface (8b) with a channel (13) for housing the connecting section (10c) of the "U", and an upper projection (14) on which the two legs (10a, 10b) of the "U" rest; the two legs (10a, 10b) in practice being retained by the two radial projections (8c, 8d) of the ring (8a).
 8. The handle according to claim 4, wherein the contact element (8) consists of a ring (8a) with two opposite radial projections (8c, 8d) extending towards the inside of the ring (8a); the projections (8c, 8d) engaging two diametrically opposed longitudinal through-openings or grooves (7c, 7d) made on the end (7a) of the handgrip (7) with the square cross-section, the handle being **characterised in that** the retaining means consist of an inverted "U"-shaped elastic element (10') and where the connecting section (10'a) of the "U" and the open ends of the legs (10'b, 10'c) of the "U" are angled to form a bridge-shaped elastic element (10'); the section (10'a) and the ends of the legs (10'b, 10'c) being able to stably connect by snapping into place at corresponding seats or channels (15, 16) in the body (5), allowing elastic coupling, on opposite sides, of the two parallel legs (10'b, 10'c) of the "U" in a groove (11) in a cylindrical end portion (7a) of the handgrip (7), allowing its releasable axial retention.
 9. The handle according to claim 8, **characterised in that** the angled ends of the legs (10'b, 10'c) have an additional and relative extension (17, 18), perpendicular to the ends and opposite each other to form a lower connecting zone for the elastic element (10') on the body (5).
 10. The handle according to claims 1 to 3 and 5, **characterised in that** the elastic means (8) comprise at least a circular open wire spring (19) inserted between the contact ring (8a) and the body (5) which has a relative seat (20) to house it; the spring (19) having two radial projections (19a, 19b) at the free ends, which make contact with two opposite surfaces of a ring (8a) semi-circular inner bulge (21).
 11. The handle according to claims 1 to 3 and 5, **characterised in that** the elastic means (8) comprise two wire springs (22, 23), each omega-shaped and inserted between the contact ring (8a) and the body (5) which has a seat (20) to house them; the two springs (22, 23) being positioned opposite each other.

er and their free projections making contact on both sides with the surfaces of corresponding contact ring (8a) semi-circular bulges (21, 21a).

12. The handle according to claims 1, 2 and 4, **characterised in that** the elastic means (8) comprise at least two helical springs (24, 25), inserted between the contact ring (8a) and the body (5) which has a seat (26) to house them; the two springs (24, 25) in practice being positioned opposite each other to form a sort of ring in the body (5), and their free ends making contact on both sides with the surfaces of corresponding contact ring (8a) bulges (8c, 8d). 5 10
13. The handle according to claim 1, **characterised in that** a cover (30) with an opening (30a) for the passage of the handgrip (7) can be stably coupled on the body (5). 15

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FIG.1

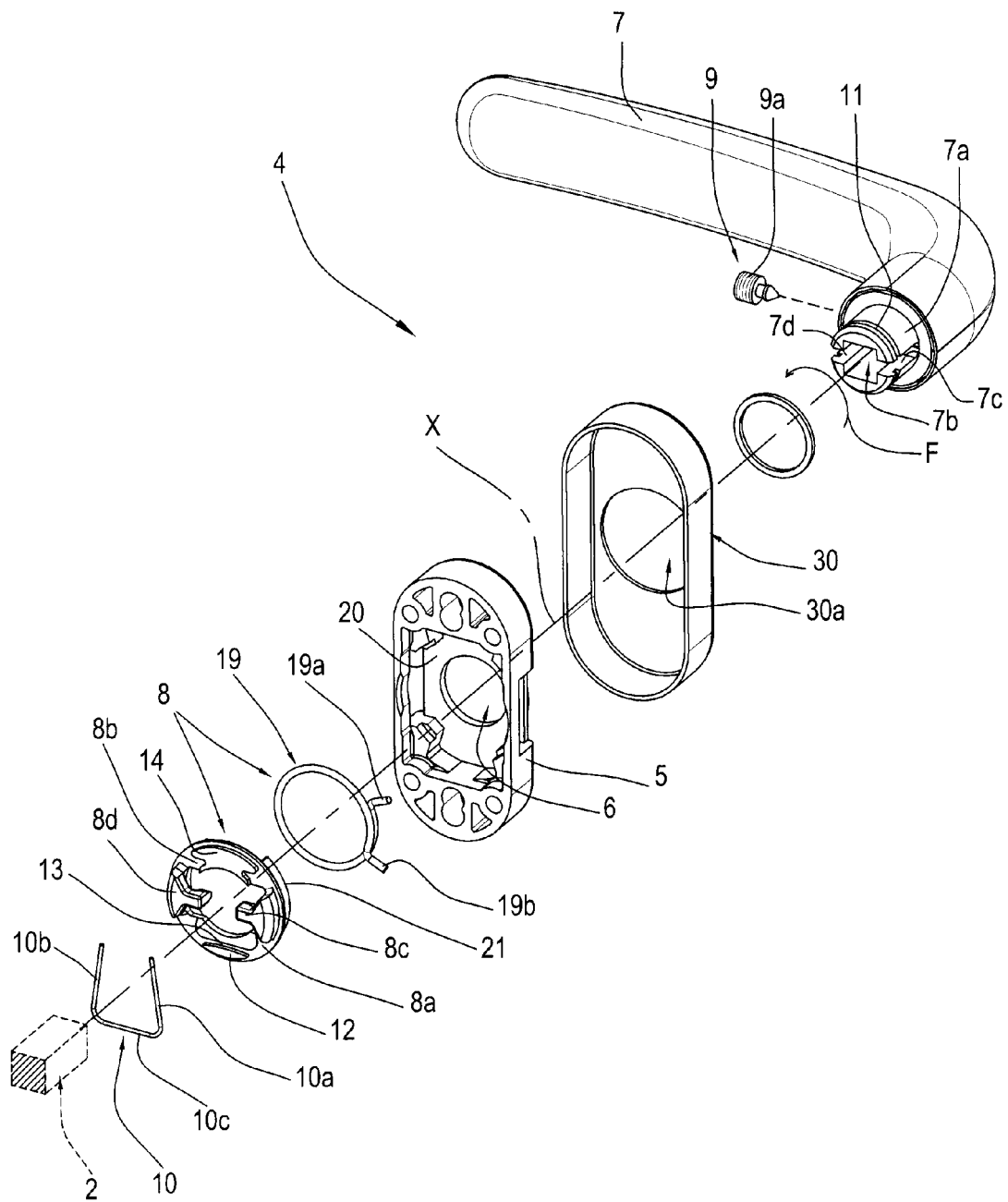


FIG.2

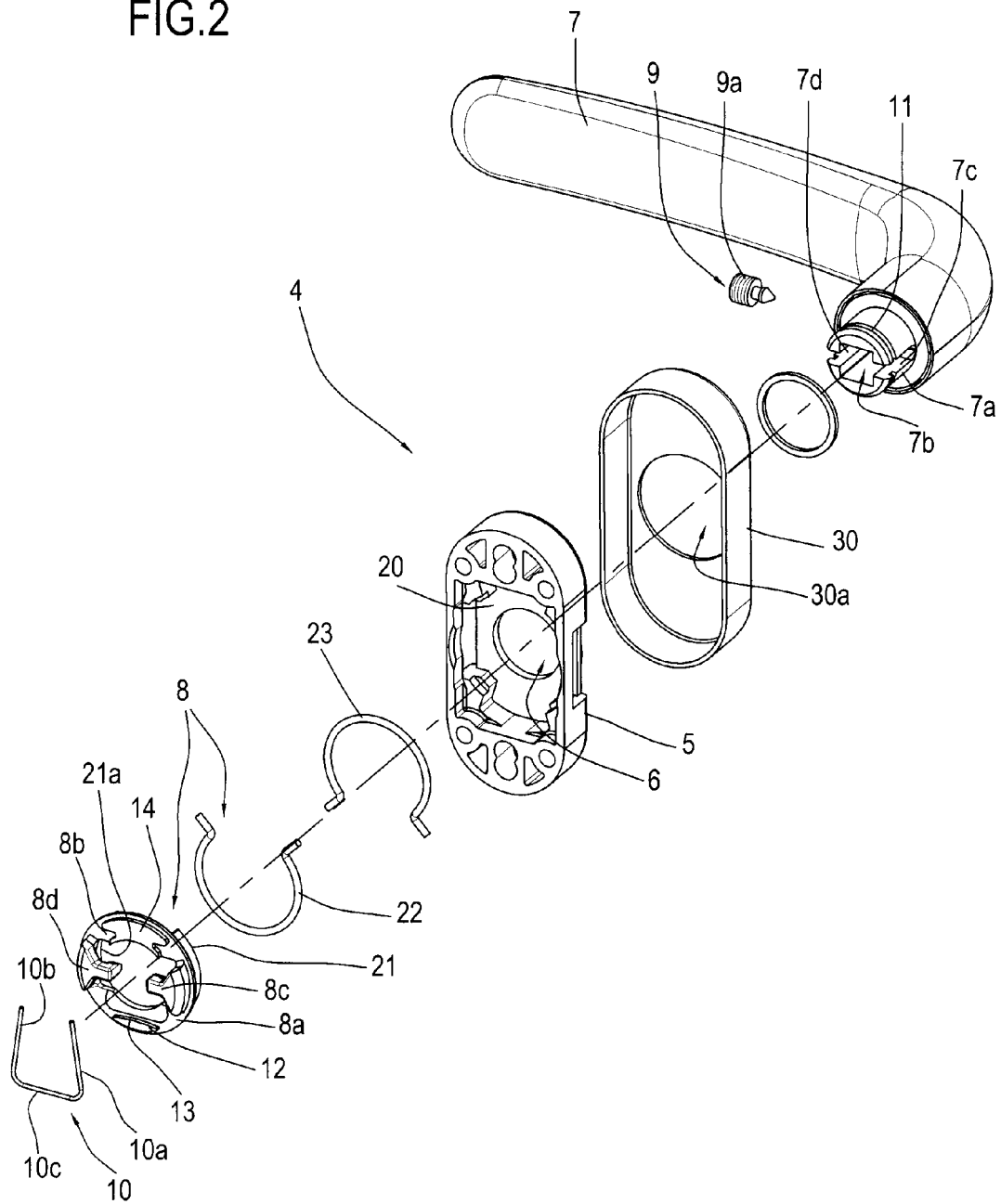


FIG.3

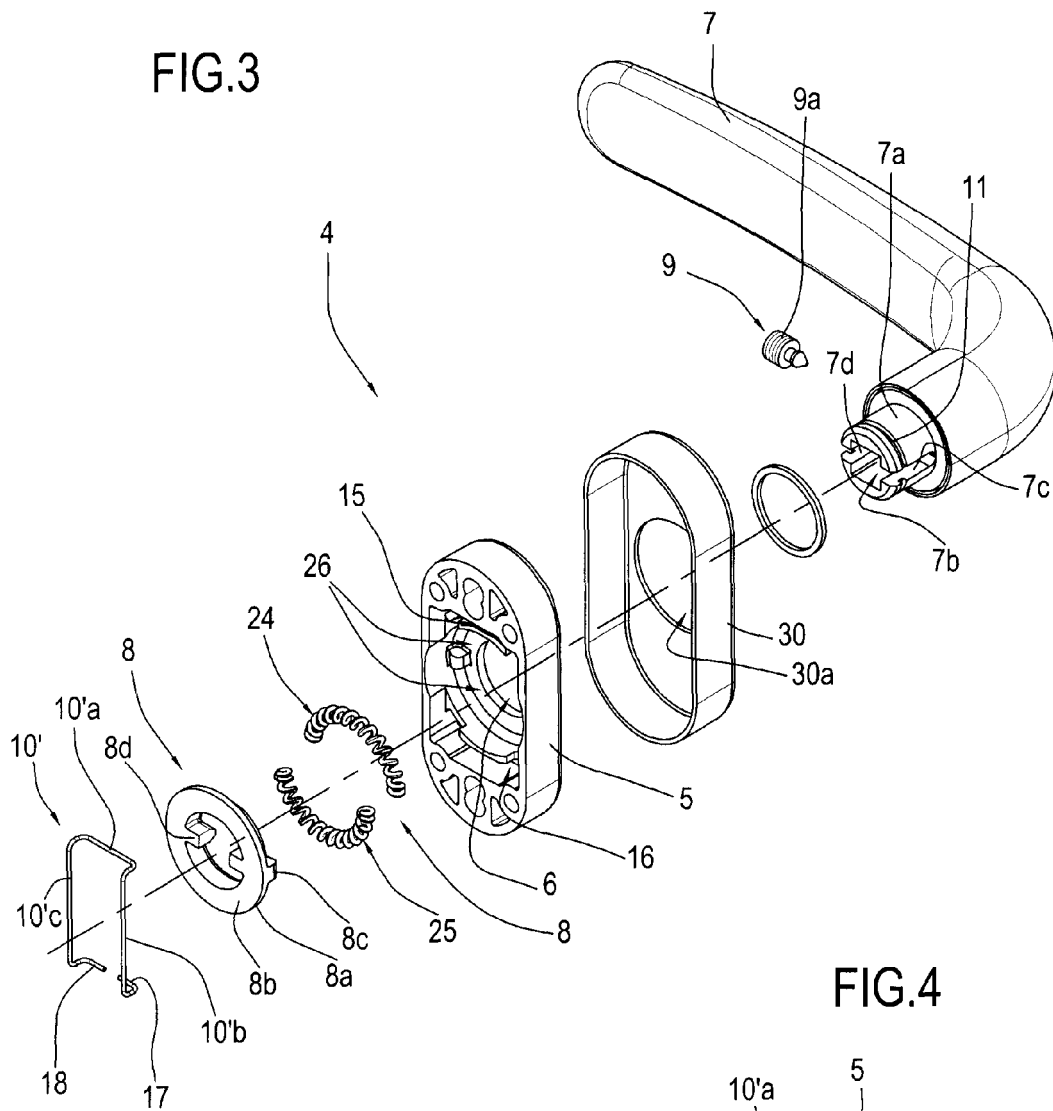


FIG.4

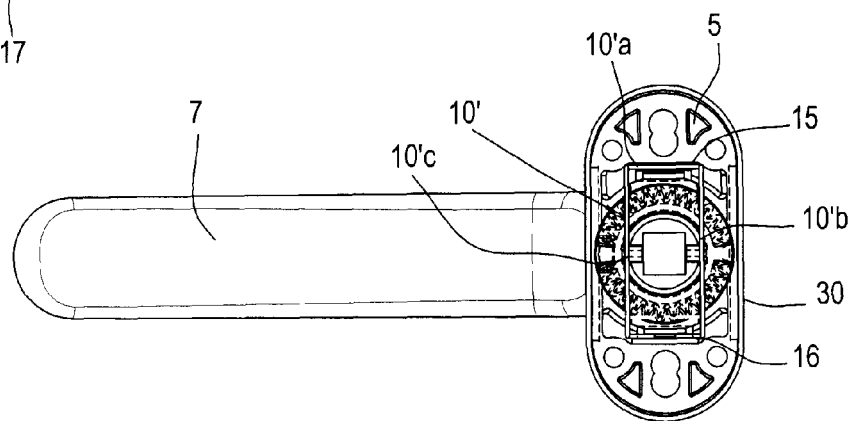


FIG.5

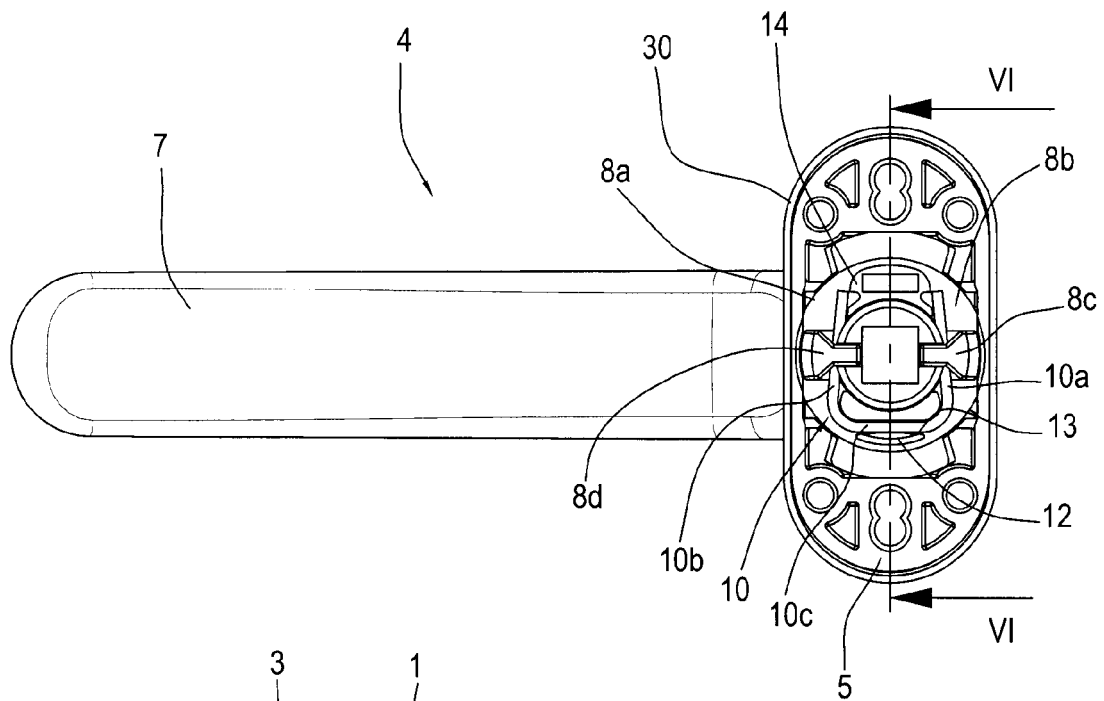


FIG.6

