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(54) **SAFETY DEVICE FOR HANDLES**

(57) It is disclosed a security device (1) for shutters and frames (100) of the type that comprise an activating lever (2) rotatable around a rotation axis (R-R) between at least one closed position and at least one open position, said activating lever (2) comprising a handle (3) and an operating shaft (4) to activate a clamping mechanism for shutters and frames, a washer (5) provided with a hub (9) for supporting said activating lever (2), and a covering element (7) adapted to cover at least partially said washer (5), said covering element (7) being provided with a through-hole (7a) for passing a coupling portion (12) of said activating lever (2), characterized in that said covering element (7) is movable between a distal position (P1) and a proximal position (P2) with respect to said washer (5) and in that it comprises countering elastic means (13) to hold said covering element (7) in said distal position (P1), and shape-interfering locking means (14) between said covering element (7) and said coupling portion (12) of the activating lever (2) to prevent the rotation of the activating lever (2) when said covering element (7) is in said distal position (P1), and to allow the rotation of the activating lever (2) when said covering element (7) is in said proximal position (P2). It is also disclosed a method for locking and unlocking a handle (3) by means of a security device (1) for shutters and frames (100) characterized by comprising the steps of a) rotating the activating lever (2) to lead it in said at least one closed position, b) locking the handle (3) by leading the covering element (7) in a distal position (P1) with respect to the washer (5), c) unlocking the handle (3) by leading said covering element (7) in a proximal position (P2) with respect to the washer (5) and d) rotating the activating lever (2) to lead it in at least one open position, wherein said

step b) is carried out by means of shape-interfering locking means (14) between the covering element (7) and a coupling portion (12) of the activating lever (2).

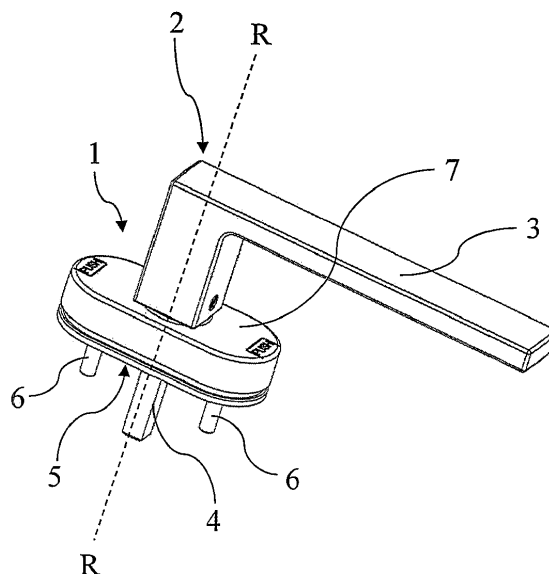


Fig. 1B

Description

Field of the Invention

[0001] The present invention relates to a security device for handles. The invention is mostly used in handles for "shutters and frames" (such as for example doors, windows, etc.) in order to prevent the opening of the shutter and frame by unauthorized persons.

Known prior art

[0002] It is known that security of a house strongly depends on shutters and frames by means of which various access points of a house can be opened and closed. In particular, in addition to the entrance door (which can be an armored door), a house is normally provided with further access points, such as for example windows, French doors overlooking on balconies, terraces or gardens.

[0003] Such shutters and frames are often the weak point for the security of a house. Typically, they comprise walls made with thicknesses and/or materials (for example glass, wood, etc.) that can make the shutter and frame easily vulnerable to tampering (for example perforations). A technique by which thieves often can open such shutters and frames consists in making a through-hole of little size on a wall of the shutter and frame. The hole can be made silently and in a short time. From the through-hole it is thus possible to introduce a suitably bent bar inside the house, whereby it is possible to move the handle of the shutter and frame (for example by turning it) causing the opening thereof.

[0004] In order to try to prevent this type of intrusion, handles provided with a lock operable by means of a key adapted to lock the rotation of the handle and to make the opening of the shutter and frame by the thieves an extremely complex operation or, anyway, a long and/or noisy operation (for example, the thieves may be forced to make a passage with large dimensions on the shutter and frame from which they may sneak into the house), are known.

[0005] Such security systems, if on one hand allow avoiding the opening of the handle by strangers, on the other hand they oblige the house owner and inhabitants to use the keys each time they should open the window, if it has been previously locked. Such a situation, in addition to be awkward, could also be dangerous in case of emergency during which it could be needed to quickly open the windows and/or doors of the house, for example for an evacuation or to ventilate the environment in case of gas leak. The presence of keys to open the various locks of the handles may extend the opening operation of the shutters and frames during an emergency.

[0006] Therefore, it arises the need to make a security device by means of which it is possible to lock the handle of the shutter and frame by preventing to intruders from opening the shutter and frame from the house outside and, at the same time, allowing to the house owners to

quickly, easily and rapidly open the shutter and frame from the house inside.

[0007] In order to satisfy such a need, handles provided with a locking and unlocking mechanism of the handle rotation and actuated by means of a button placed at the throat of the handle, have been made. In this way, the user can push the button with the thumb and unlock the rotation of the handle by grabbing the handle.

[0008] Even such a solution is not free of defects. In fact, such devices turn out to be mechanically complex and make the handle unreliable over time. Moreover the unlocking button turns out to be visible from outside (for example if the window is made of glass), thus overall reducing the security of the handle. In particular, the intruders noticing the button could make one further hole to insert a hook-shaped bar that allows pushing the button from outside.

[0009] A further need relative to handle security systems is to avoid the opening of the windows by children at home. A young child, realizing that there is an unlocking button on the handle, could easily try to push it and succeed in opening the window. A solution may be to make the button of the handle so that it could be pushed with high force. In this way, a young child cannot unlock the handle since not able to apply a high force on the button, but the unlocking of the handle may turn out being an awkward operation for an adult that will need to apply a certain force on the button to be able to open the shutters and frames.

Summary of the invention

[0010] Object of the present invention is to provide a security device for shutters and frames, of simple construction and able to lock the handle of a shutter and frame in a safer and more reliable way with respect to security devices of known art.

[0011] Further object of the present invention is to provide a security device for shutters and frames and a method for locking and unlocking a handle able to make the unlocking of the handle a simple and quick operation for an adult and, at the same time, difficult for a child.

[0012] These and further objects are solved by the present invention by a security device for shutters and frame according to claim 1 and the respective dependent claims, and a method for locking and unlocking a handle according to claim 11 and the respective dependent claims.

[0013] In particular, the security device according to the present invention is adapted to be installed on shutters and frames of the type that comprise an activating lever rotatable around a rotation axis between at least one closed position and at least one open position of the shutter and frame.

[0014] The activating lever, according to known art, comprises a handle, i.e. a member intended to be grasped by the user, and a respective operating shaft. The operating shaft can have quadrangular section in

order to activate a clamping mechanism for shutters and frames of known type by transmitting its rotary motion, herein not further specified. Typically, the handle is provided with a "neck" (i.e. an ending portion of the handle) having a seat with section equal to that of the operating shaft, for example and preferably with a quadrangular section, and is adapted to axially accommodate an ending portion of such an operating shaft. In this way, by rotating the handle the rotation is transmitted to the operating shaft to activate the clamping mechanism of the shutter and frame.

[0015] The activating lever is normally coupled to the shutter and frame by means of a supporting element named "rosette" (i.e. a washer). The washer, for example typically made of plastic or metallic material, is fixed to a wall of the shutter and frame (for example by means of screws), close to the clamping mechanism. The washer is provided with a hub for supporting and placing the activating lever correctly with respect to the clamping mechanism of the shutter and frame, thus allowing the activating lever to reach different open and closed positions of the shutter and frame.

[0016] Note that to axially constrain the handle to the operating shaft (and thus avoiding the handle from slipping off the operating shaft itself), some activating levers are provided with a screw, or similar threaded element, adapted to transversely engage on the neck of the handle until reaching and locking the ending portion of the operating shaft. Other activating levers provide for the handle neck and the washer hub being provided with quick hooking means so that to constrain the neck of the handle to the hub by preventing the axial movement of the handle.

[0017] Typically, the washer is covered by a covering element used to hide the fixing screws of the washer that may look unsightly.

[0018] The covering element can be cup-shaped, i.e. having a concave shape, to cover at least even partially the edge of the washer. The inner part of the covering element, i.e. the part interfacing with the washer, can further be provided with ribs to constrain the edge of the covering element with the edge of the washer.

[0019] Preferably, the covering element, independently of the particular shape taken, is configured to cover at least the entirety of a face of the washer. More preferably, the covering element comprises a covering portion extending on a plane substantially perpendicular to the rotation axis of the handle. Said covering portion is configured to substantially cover the entire outer surface of the washer.

[0020] Also, the covering element is usually provided with a through-hole so that a coupling portion of the activating lever can pass. The coupling portion is a substantially intermediate portion of the activating lever, in particular it can be defined as the portion of the activating lever at the coupling between the operating shaft and the handle, substantially placed close to the hub of the washer. In other words, the coupling portion of the activating

lever can comprise, or be constituted by, at least one ending portion of the operating shaft and/or at least one ending portion of the handle (for example a portion of the neck of the handle) and/or at least one portion of the hub of the washer.

[0021] According to an aspect of the present invention, the covering element is movable between a distal position and a proximal position with respect to the washer. In other words, the covering element can substantially translate along the rotation axis of the activating lever between two positions: a proximal position, i.e. at a short distance from the washer (for example in contact with the washer), and a distal position, i.e. at a longer distance from the washer.

[0022] According to the present invention, the security device also comprises countering elastic means to hold the covering element in distal position. The elastic means can comprise for example springs arranged between the washer and the covering element. In a preferred embodiment of the present invention, the elastic means can be made integrally to the washer, for example they can comprise flexible protrusions jutting from the washer towards the covering element.

[0023] The security device according to the present invention further comprises shape-interfering locking means between the covering element and the coupling portion of the activating lever. Such locking means are shaped to obtain shape interference between the coupling portion of the activating lever and the covering element, in order to prevent the rotation of the activating lever when the covering element is in distal position. Furthermore, the locking means are shaped so that when the covering element is led to proximal position, the covering element doesn't interfere with the coupling portion of the activating lever and thus the locking means allow the rotation of the activating lever.

[0024] According to another particular aspect of the present invention, the shape-interfering locking means are preferably arranged between the through-hole of the covering element and the coupling portion of the activating lever. For example, the locking means can comprise a portion of the covering element (preferably at the through-hole) having a shape complementary to a corresponding part of the coupling portion of the activating lever.

[0025] Preferably, the shape of the through-hole can advantageously be made so that to obtain at least one fin jutting towards the inside of the through-hole. In this case the locking means further comprise at least one seat made on the coupling portion of the activating lever, adapted to accommodate the respective fin when the covering element is in the distal position. For example, one or more seats can be made on the outer surface of the hub of the washer so that to prevent the rotation of the hub and, consequently, of the activating lever thanks to the shape interference between at least one fin of the covering element and at least one seat of the hub.

[0026] Further, according to a further particular aspect

of the present invention, the coupling portion of the activating lever comprises a groove to allow the rotation of the activating lever when the covering element is in the proximal position. In particular, the groove reduces the section of the coupling portion interfacing with the covering element so that the covering element doesn't interfere with the coupling portion when the covering element is in the proximal position.

[0027] Preferably, the shape-interfering locking means are arranged so that the interference between the coupling portion and the covering element is obtained when the activating lever is in the closed position. Thus, starting from a closed position of the activating lever, wherein the covering element is held in distal position by elastic means, in order to rotate the activating lever from the closed position to an open position, the user must press the covering element to lead it to the proximal position. Once the covering element has been led to proximal position, the user can rotate the activating lever until reaching an open position.

[0028] In a preferred embodiment of the present invention, the locking means can be shaped so that the covering element can move back to the distal position (by the thrust of the elastic means) when the activating lever is in the open position. In this case, once the covering element reached the distal position, it interferes with the coupling portion of the activating lever preventing the rotation even when the activating lever reached the open position. In this embodiment, the covering element must be pressed and held in proximal position also to lead the activating lever from an open position to a closed position.

[0029] In another preferred embodiment of this invention, the locking means can be shaped so that the covering element is still hold in the proximal position when the activating lever reaches an open position. In this embodiment, the shape-interfering locking means are arranged so that the rotation of the activating lever is only prevented when the activating lever has reached a closed position.

[0030] When the activating lever reached an open position, the covering element remains in the proximal position, thus, starting from an open position, the user can rotate the activating lever with one hand only until the activating lever reaches the closed position. During the rotation of the activating lever from the open position towards the closed position, the covering element doesn't interfere with the activating lever thanks to the groove made on the coupling portion of the activating lever. The groove is shaped so to axially counter the thrust of the elastic means by holding the covering element in proximal position with no need by the user to hold it pressed.

[0031] When the activating lever reaches the closed position, the covering element pushed by the elastic means reaches the distal position and, by interfering with the coupling portion, prevents a subsequent rotation of the activating lever.

[0032] According to another particular aspect of the invention, the elastic means (for example springs and/or

flexible protrusions) are arranged next to at least two pressure points of the covering element. The two or more pressure points are configured to allow the movement of the covering element from the distal position to the proximal position only if pressed together.

[0033] Preferably, the rotation axis of the activating lever is arranged between the aforementioned two or more pressure points of the covering element.

[0034] More preferably, the elastic means (for example springs and/or flexible protrusions) are arranged between the washer and the covering element symmetrically with respect to the rotation axis of the activating lever, preferably in at least two diametrically opposite points.

[0035] Such a configuration turns out being effective to prevent the opening of the shutter and frame by unauthorized persons, for example by children that would hardly be able to press the covering element on two distant points with one hand only and, at the same time, rotate the handle with the other hand by holding the covering element pressed. Instead, such an operation turns out being easy for an adult. Also since an unlocking button or lever (such as for example in the security devices of the known art) is not visible, the security device according to the present invention turns out being less avoidable by thieves and esthetically less invasive with respect to the known security devices discussed above.

[0036] Another object of the present invention is a method for locking and unlocking a handle by means of a safety device comprising an activating lever rotatable between at least one open position and at least one closed position, a washer, and a movable covering element adapted to cover at least partially said washer, said activating lever comprising a handle coupled with an operating shaft of a clamping mechanism for shutters and frames.

[0037] The method comprises the steps of:

- a) rotating the activating lever to lead it to said at least one closed position;
- b) locking the handle by leading the covering element to a distal position with respect to the washer;
- c) unlocking the handle by leading said covering element to a proximal position with respect to the washer;
- d) rotating the activating lever to lead it to at least one open position.

[0038] In other words, the covering element can be moved closer and away with respect to the washer, between a proximal position and a distal position. Preferably the locking and unlocking of the handle happen by axially translating the covering element between the distal position and the proximal position. The step of b) locking the handle is carried out through shape-interfering locking means between the covering element and a coupling portion of the activating lever.

[0039] According to a particular aspect of the present

invention, step b) is carried out through countering elastic means arranged between the covering element and the washer, and step c) is carried out by pressing the covering element. The unlocking of the handle can only take place if the covering element is pressed to lead it to the proximal position. Thus, to open the shutter and frame the user must use two hands, thus making such an operation less avoidable by unauthorized persons.

[0040] According to another particular aspect of the present invention, step c) is carried out by pressing at least two points of the covering element, preferably at least two diametrically opposite points. In this way the unlocking of the handle turns out being less intuitive to children, as well as more complex to be eluded from outside the house by means of the above described usual burglary techniques.

[0041] Therefore, thanks to the present invention, it is possible to make an inexpensive security device of simple construction, for shutters and frames. The ease of construction further allows to adapt the device according to the present invention to any type of shutter and frame without alteration of the appearance of the handle and/or of the shutter and frame and ensuring an adequate security against intrusions and unauthorized openings of the shutter and frame.

Brief description of the drawings

[0042] Further aspects and advantages of the present invention will be more evident from the following description, made for illustration purposes only and without limitation, referring to the accompanying schematic drawings, in which:

- Figures 1A and 1B are perspective views of a handle for shutters and frames provided with a particular embodiment of the security device according to the present invention;
- Figure 2 is an exploded view of the handle for shutters and frames shown in figures 1A and 1B;
- Figures 3 and 4 are sectional views of the handle for shutters and frames shown in the preceding figures in two different operative conditions of the security device according to the present invention;
- Figure 5 is a perspective view of the washer of the handle for shutters and frames provided with the security device according to the present invention in the particular embodiment shown in the preceding figures;
- Figure 6 is a perspective view of the covering element of the handle for shutters and frames provided with the security device according to the present invention in the particular embodiment shown in the preceding figures;
- Figures 7A and 7B are perspective views of the hub of the handle for shutters and frames provided with the security device according to the present invention in the particular embodiment shown in the pre-

ceding figures;

- Figures 8A and 8B show two steps of operation of the method for locking and unlocking a handle for shutters and frames provided with the security device according to the present invention.

Embodiments of the invention

[0043] In figure 1A a portion of a shutter and frame 100 (for example a window) provided with the security device 1 according to a particular embodiment of the present invention, is shown. The shutter and frame 100 is provided with a clamping mechanism (not shown), known per se in the art, operable by means of an activating lever 2. With reference to figure 1B, the activating lever 2 comprises a handle 3 and an operating shaft 4 preferably with a quadrangular section and coupled with the clamping mechanism. The activating lever 2 is rotatable around a rotation axis R-R between at least one open position and at least one closed position. For example, in case the shutter and frame 100 is a window provided with a bottom-hinged opening (i.e. a window with a "vasistas" opening), the activating lever 2 is preferably rotatable between a closed position and two open positions. Starting from the closed position of the activating lever, as shown in figure 1A, we have that a rotation of the handle 3, preferably by 90° in one or the other way, causes a corresponding rotation of the operating shaft 4 whereby the clamping mechanism is actuated to obtain the two corresponding opening modes of the shutter and frame 100 (normal opening or bottom-hinged opening).

[0044] The activating lever 2 is applied to the shutter and frame 100 by means of a supporting element 5 named "rosette" (i.e. a washer 5). The washer 5 is stably constrained to the shutter and frame 100 by means of fixing screws 6 or similar fixing means and is thus covered by a covering element 7 typically adapted to hide the fixing screws 6.

[0045] With reference to figure 2, the operating shaft 4 comprises an ending portion 4a adapted to be coupled to the handle 3. In particular, the ending portion 4a of the operating shaft 4 is inserted in a seat with quadrangular section made on the neck 3a of the handle 3, so that to transmit the rotation of the handle 3 to the operating shaft 4. Furthermore, the handle 3 and the operating shaft 4 are constrained by means of a transversal screw 8, or a grub screw, screwed close to the neck 3a of the handle 3 until reaching the ending portion 4a of the operating shaft 4 being inside the neck 3a of the handle 3.

[0046] The washer 5 comprises a hub 9 for supporting the activating lever 2. The hub 9 is rotatable inside the washer 5 and is provided with a through-hole 9a (visible in figure 7A) with quadrangular section adapted to accommodate the operating shaft 4. A rotation of the activating lever 2 causes a rotation of the hub 9 with respect to the washer 5. In particular, the hub 9 is housed inside the washer 5 and closed inside it through a base plate 10 constrained to the washer 5 by means of latches 10a.

Preferably, between the handle 3 and the hub 9 a spacer 11 can be arranged to improve the coupling.

[0047] Once the washer 5 has been fixed to the shutter and frame 100 by means of the fixing screws 6, it is covered by the covering element 7 that is provided with a through-hole 7a through which the operating shaft 4 is passed. In the embodiment shown in the figures, the through-hole 7a is further adapted to the passage of the neck 3a of the handle 3, the neck being housed inside a seat of the hub 9, and of at least one portion 12 of hub 9 surrounding the neck 3a of the handle 3.

[0048] In general, the through-hole 7a of the covering element 7 allows the passage of a coupling portion 12 of the activating lever 2. Such a coupling portion 12 can comprise, or coincide with, at least one ending portion 4a of the operating shaft 4 and/or at least one ending portion of the handle 3 (for example a portion of the neck 3a of the handle 3) and/or at least one portion of the hub 9 of the washer 5.

[0049] With reference to figures 3 and 4, the covering element 7 is movable between a distal position P1 (shown in figure 3) and a proximal position P2 (shown in figure 4) with respect to the washer 5. In particular, the covering element 7 can be actuated, preferably by axial translation along the rotation axis R-R of the activating lever 2, so that to approach and move away from the washer 5. During the movement of the covering element 7 between the distal position P1 and the proximal position P2, the coupling portion 12 of the activating lever 2 passes through the through-hole 7a of the covering element 7.

[0050] The device 1 preferably comprises countering elastic means 13 to hold the covering element 7 in the distal position P1. In the embodiment shown in the figures, the elastic means 13 comprise at least two flexible protrusions 13a jutting from the washer 5. Thus, starting from an initial condition wherein the covering element 7 is in the distal position P1 (shown in figure 3), the user can lead the covering element 7 to the proximal position P2 (shown in figure 4) by pressing on it so as to counter the elastic return of the flexible protrusions 13a. In figure 4, the covering element 7 is in the proximal position P2 and the protrusions 13a are in a deformed configuration. When the user doesn't apply a force on the covering element 7, the flexible protrusions 13a push the covering element 7 by leading it back to the distal position P1.

[0051] With reference to the figure 5, the protrusions 13a are jutting from the washer 5, preferably perpendicularly with respect to the longitudinal axis of the washer 5, preferably in a direction substantially parallel to the rotation axis R-R of the activating lever 2. The protrusions 13a are integral with two flexible arches 13b made for example by molding them together with the washer 5. Further embodiments can anyway provide for the elastic means 13 comprising for example at least one spring (for example one spring arranged co-axially to the activating lever 2 or, for example, a plurality of springs arranged around the activating lever 2) or similar elastic means adapted to hold the covering element 7 in the distal po-

sition P1 with respect to the washer 5, still remaining within the protection scope of the present invention.

[0052] Preferably, the elastic means 13 are arranged next to at least two pressure points 7d of the covering element 7. In the embodiment shown in figure 5, the elastic means 13 are arranged at the two pressure points 7d depicted in figure 6. The pressure points 7d are configured to allow the movement of the covering element 7 from the distal position P1 to the proximal position P2 only if pressed together.

[0053] The device 1 comprises shape-interfering locking means 14 between the covering element 7 and the coupling portion 12 of the activating lever 2. In particular, when the covering element 7 is in the distal position P1, the locking means 14 cause shape interference between the coupling portion 12 and the covering element 7, thus preventing the rotation of the activating lever 2. The locking means 14 are shaped so that when the covering element 7 is in proximal position, there is no shape interference between the coupling portion 12 and the covering element 7, thus allowing the rotation of the activating lever 2.

[0054] With reference to figure 6, according to a particular embodiment of the present invention, the covering element 7 comprises a covering portion 7b extending on a plane substantially perpendicular to the rotation axis of the handle. The through-hole 7a is made on the covering portion 7b configured to substantially cover the entire face of the washer 5. Preferably, the covering element 7 comprises a further lateral covering portion 7c extending substantially perpendicularly to the covering portion 7b. The lateral covering portion 7c is configured to cover at least part of the edge of the washer 5.

[0055] With reference to figure 6, the covering element 7 is preferably provided with two fins 14a made on the perimeter of the through-hole 7a. The fins 14a are jutting towards the inside of the through-hole 7a and are adapted to engage in two respective seats 14b made on the outer wall of the hub 9. With reference to figures 7A and 7B, the hub 9 of the washer 5 is provided with a collar 9b with two indentations 14b forming the seats adapted to accommodate the fins 14a of the covering element 7 when the latter is in the distal position P1.

[0056] When the covering element 7 is in the distal position P1, the fins 14a are engaged inside the seats 14b of the hub 9. The shape interference between the fins 14a of the covering element 7 and the hub 9 of the washer 5 doesn't allow the rotation of the activating lever 2 since the covering element 7 is not rotatable with respect to the washer 5.

[0057] In this embodiment the coupling portion 12 of the activating lever 2 comprises the portion of the hub 9 (i.e. the collar 9b) provided with the two seats (i.e. the two indentations 14b) adapted to accommodate the two fins 14a of the covering element 7.

[0058] The coupling portion 12 further has a groove 15 arranged below the collar 9b. Thus, the coupling portion 12, at the groove 15, has a section - the groove 15 - with

reduced diameter. By leading the covering element 7 to its proximal position P2, the fins 14a of the covering element 7 are led below the collar 9b, inside the groove 15. In this position, the fins 14a don't interfere with the coupling portion 12 since it has, as mentioned, a reduced diameter (precisely that one of the groove 15), and thus the coupling portion 12 can rotate without interfering with the covering element 7.

[0059] Further embodiments can provide for the shape-interfering locking means 14 being shaped differently with respect to the embodiment herein shown in the figures. For example, the shape interference can be obtained between a portion 4a of the operating shaft 4 and the covering element 7 or between the neck 3a of the handle 4 and the covering element 7, still remaining in the protection scope of the present invention. In general, the security device 1 according to the present invention comprises shape-interfering locking means 14 between the movable covering element 7 and a coupling portion 12 of the activating lever 2.

[0060] Further embodiments can for example provide for the through-hole 7a being made with quadrangular section and the collar 9b of the hub 9 (or in general of the coupling portion 12) being also made with quadrangular section of limited extent, so that to prevent the rotation of the activating lever 2 when the covering element 7 is in its distal position P1, allowing instead the rotation of the activating lever 2 when the through-hole 7a, following the arrangement of the covering element 7 in its proximal position P2, goes beyond the aforementioned quadrangular section of the collar 9b, thus leaving the relative hub 9 and thus the lever 2 free to rotate.

[0061] With reference to figures 6, 7A and 7B, the fins 14a of the covering element 7 are placed so that when the activating lever 2 is in closed position, they are aligned with the seats 14b made on the hub 9.

[0062] In particular, with reference to figure 8A, we have that starting from the closed position of the activating lever 2 and leading the covering element 7 to proximal position P2, the coupling portion 12 and the covering element 7 don't interfere one to another thanks to the presence of the groove 15 which allows the fins 14a of the covering element 7 to slide inside it. As shown in figure 8B, the activating lever 2 can be rotated and led to an open position by holding the covering element 7 in proximal position P2, i.e. by pressing the covering element 7 to counter the elastic return of the flexible protrusions 13a or, in general, of the countering elastic means 13. In other words, the user needs both hands to open the shutter and frame 100.

[0063] When the activating lever 2 has reached an open position (for example it has been rotated by 90° with respect to the closed position), the seats 14b of the coupling portion 12, i.e. the indentations 14b made on the collar 9b of the hub 9, are not aligned with the fins 14a of the covering element 7 (they are out of phase by 90°). In this position (open position) the covering element 7 cannot return to the distal position P1 since the fins 14a

remain inside the groove 15, thus the covering element 7 remains in proximal position P2 even if the user doesn't press on the covering element 7.

[0064] In other words, when the activating lever 2 is in the open position, the covering element 7 is held in the proximal position P2 by the groove 15 axially countering the elastic return of the flexible protrusions 13a.

[0065] In this embodiment there is the advantage that, starting from an open position of the activating lever 2, the user can close the shutter and frame 100 with one hand only. In fact, when the covering element 7 is in proximal position there is no shape interference between the coupling portion 12 and the covering element 7, thus the user can rotate the activating lever 2 without having to press on the covering element 7. When the activating lever 2 reaches the closed position, the fins 14a align with the seats 14b of the hub 9 and the groove 15, as the latter does not axially counter the elastic return of the flexible protrusions 14a, allows the movable covering element 7 to return to the distal position P1 with the fins 14a engaged in the respective seats of the hub 14b.

[0066] Thus, briefly, the security device 1 according to the present invention allows locking and unlocking a handle 3 of a shutter and frame 100 by following the steps herein reported:

- a) rotating the activating lever 2 to lead it to at least one close position;
- b) locking the handle 3 by leading the covering element 7 to a distal position P1 with respect to the washer 5;
- c) unlocking the handle 3 by leading the covering element 7 to a proximal position P2 with respect to the washer 5;
- d) rotating the activating lever 2 to lead it to at least one open position.

[0067] The step of b) locking the handle 3 is carried out through shape-interfering locking means 14 between the covering element 7 and a coupling portion 12 of the activating lever 2. Thanks to the presence of elastic means 13 arranged between the covering element 7 and the washer 5, the step b) automatically happens when the activating lever 2 is in closed position.

[0068] Step c) is carried out by pressing the covering element 7 so to overcome the countering force of the elastic means 13. Preferably, step c) happens by pressing at least two pressure points 7d of the covering element 7, more preferably at least two diametrically opposite pressure points 7d.

[0069] Advantageously, step d) can be carried out only if the covering element 7 is held in the proximal position P2. In this way it is possible to prevent the opening of the shutter and frame 100 by unauthorized persons (for example by children).

Claims

1. Security device (1) for shutters and frames (100) of the type that comprise an activating lever (2) rotatable around a rotation axis (R-R) between at least one closed position and at least one open position, said activating lever (2) comprising a handle (3) and an operating shaft (4) to activate a clamping mechanism for shutters and frames, a washer (5) provided with a hub (9) for supporting said activating lever (2), and a covering element (7) adapted to cover at least partially said washer (5), said covering element (7) being provided with a through-hole (7a) for passing a coupling portion (12) of said activating lever (2), **characterized in that** said covering element (7) is movable between a distal position (P1) and a proximal position (P2) with respect to said washer (5) and **in that** it comprises countering elastic means (13) to hold said covering element (7) in said distal position (P1), and shape-interfering locking means (14) between said covering element (7) and said coupling portion (12) of the activating lever (2) to prevent the rotation of the activating lever (2) when said covering element (7) is in said distal position (P1), and to allow the rotation of the activating lever (2) when said covering element (7) is in said proximal position (P2).
2. Device (1) according to claim 1, wherein said coupling portion (12) of said activating lever (2) comprises at least one portion (9b) of said hub (9).
3. Device (1) according to claim 1, wherein said coupling portion (12) of said activating lever (2) comprises at least one ending portion (3a) of said handle (3).
4. Device according to claim 1, wherein said coupling portion (12) of said activating lever (2) comprises at least one ending portion (4a) of said operating shaft (4).
5. Device (1) according to any one of the preceding claims, wherein said shape-interfering locking means (14) between said covering element (7) and said coupling portion (12) of the activating lever (2) are arranged between said through-hole (7a) and said coupling portion (12).
6. Device (1) according to any one of the preceding claims, wherein said shape-interfering locking means (14) between said covering element (7) and said coupling portion (12) of the activating lever (2) comprise at least one fin (14a) and at least one corresponding seat (14b) that is adapted to accommodate said at least one fin (14a) when said covering element (7) is in said distal position (P1).
7. Device (1) according to any one of the preceding claims, said at least one fin (14a) being obtained on said covering element (7) and jutting towards the inside of said through-hole (7a), said at least one seat (14b) being obtained on said portion (9b) of said hub (9).
8. Device (1) according to any one of the preceding claims, wherein said coupling portion (12) of the activating lever (2) comprises a groove (15) so that the activating lever (2) can rotate when said covering element (7) is in said proximal position (P2).
9. Device (1) according to any one of preceding claims, wherein said elastic means (13) are arranged next to at least two pressure points of the covering element (7), said at least two pressure points being configured to allow the movement of said covering element (7) from the distal position (P1) to the proximal position (P2), if pressed together.
10. Device (1) according to any one of the preceding claims, wherein said elastic means (13) are arranged between said washer (5) and the covering element (7) symmetrically with respect to the rotation axis (R-R) of the activating lever (2).
11. Device (1) according to any one of the preceding claims, wherein said elastic means (13) comprise at least two flexible protrusions (13a) jutting from said washer (5).
12. Device (1) according to any one of the preceding claims, wherein said shape-interfering locking means (14) are arranged so that the activating lever (2) cannot rotate when said activating lever (2) is in said at least one closed position.
13. Method for locking and unlocking a handle (3) by means of a safety device (1) for shutters and frames (100) of the type that comprise an activating lever (2) rotatable between at least one open position and at least one closed position, a washer (5), and a movable covering element (7) adapted to cover at least partially said washer (5), said activating lever (2) comprising a handle (3) coupled with an operating shaft (4) of a clamping mechanism for shutters and frames (100), **characterized by** comprising the steps of:
 - a) rotating an activating lever (2) to lead it to said at least one closed position;
 - b) locking the handle (3) by leading the covering element (7) to a distal position (P1) with respect to the washer (5);
 - c) unlocking the handle (3) by leading said covering element (7) to a proximal position (P2) with respect to the washer (5);
 - d) rotating the activating lever (2) to lead it to at least one open position;

said step b) being carried out through shape-interfering locking means (14) between the covering element (7) and a coupling portion (12) of the activating lever (2).

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- 14.** Method according to claim 13, wherein said step b) is carried out through countering elastic means (13) arranged between the covering element (7) and the washer (5), said step c) being carried out by pressing said covering element (7).

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- 15.** Method according to claim 13 or 14, wherein said step c) happens by pressing at least two pressure points (7d) of said covering element (7), preferably at least two diametrically opposite pressure points (7d).

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- 16.** Method according to any one of claims 12 to 14, wherein said step d) is carried out by holding said covering element (7) in said proximal position (P2).

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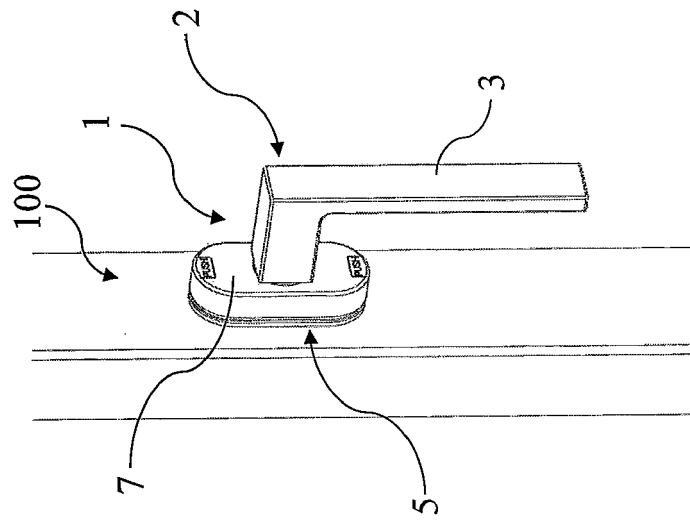


Fig. 1A

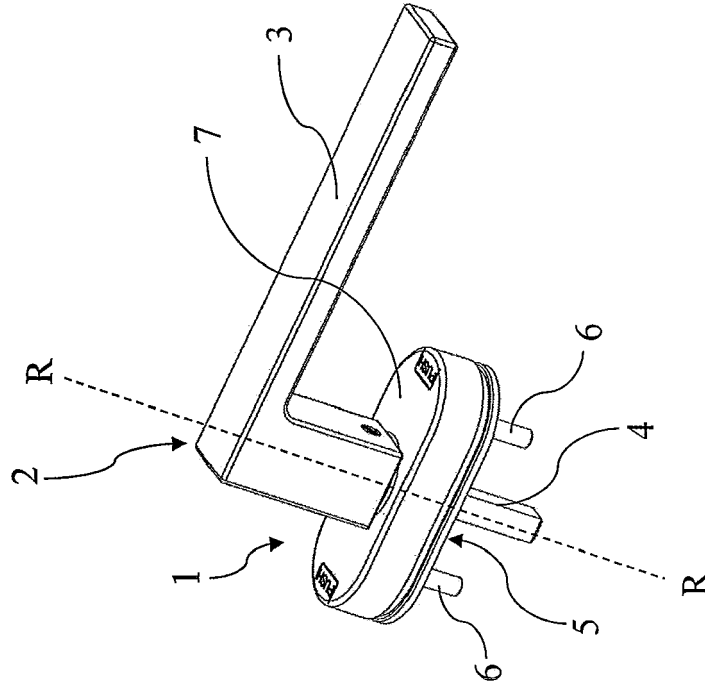


Fig. 1B

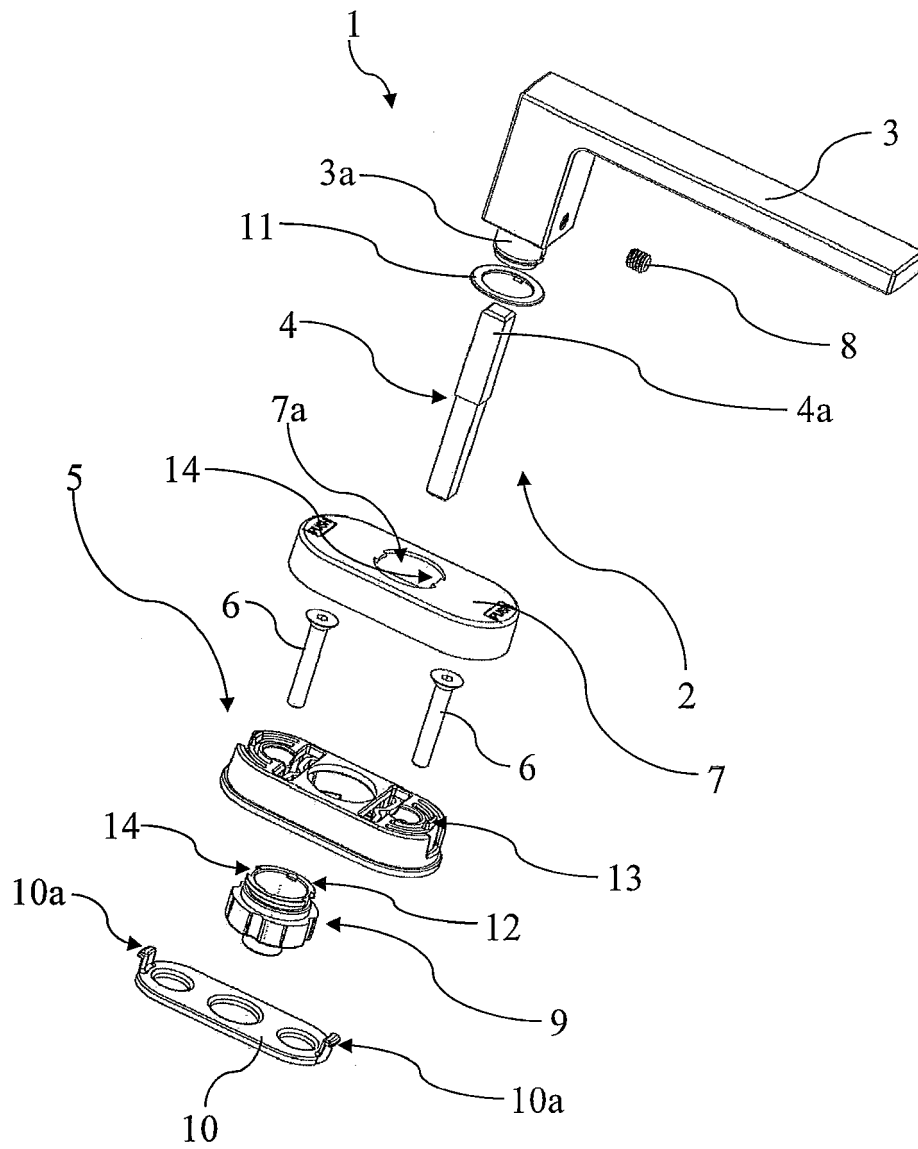
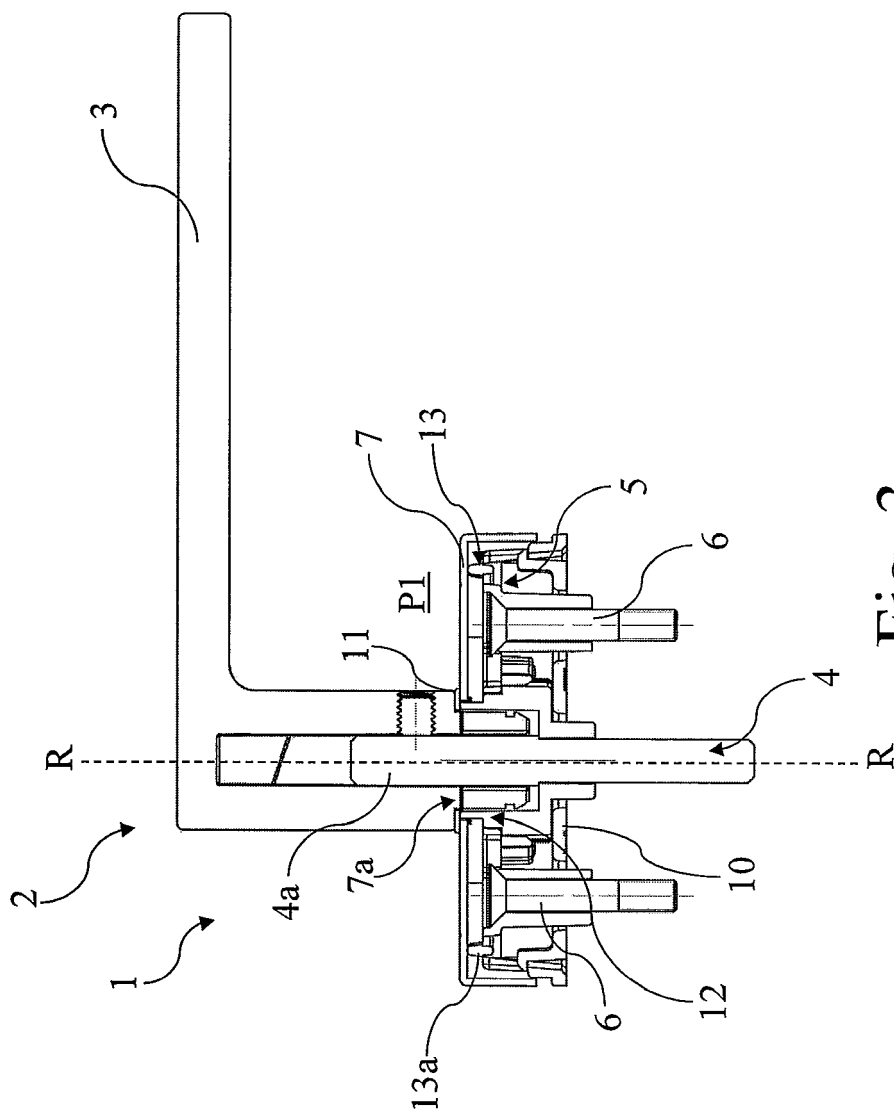


Fig. 2



Fi. 3

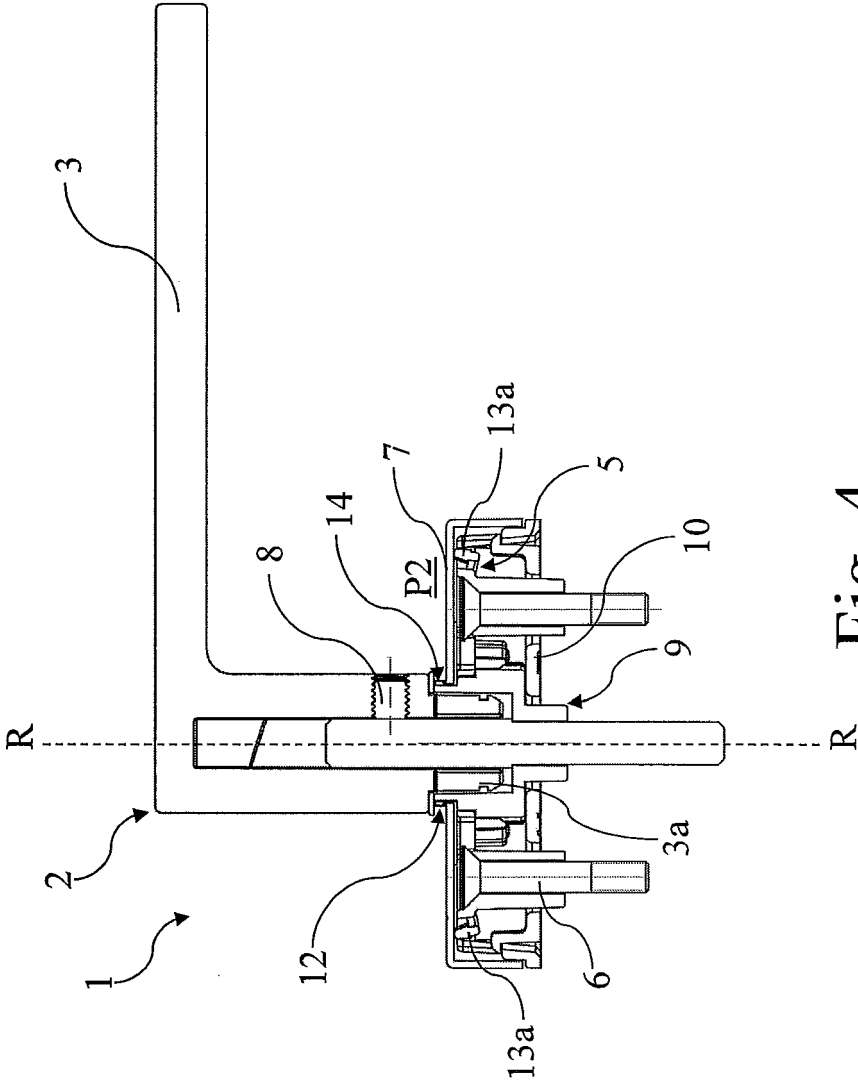


Fig. 4

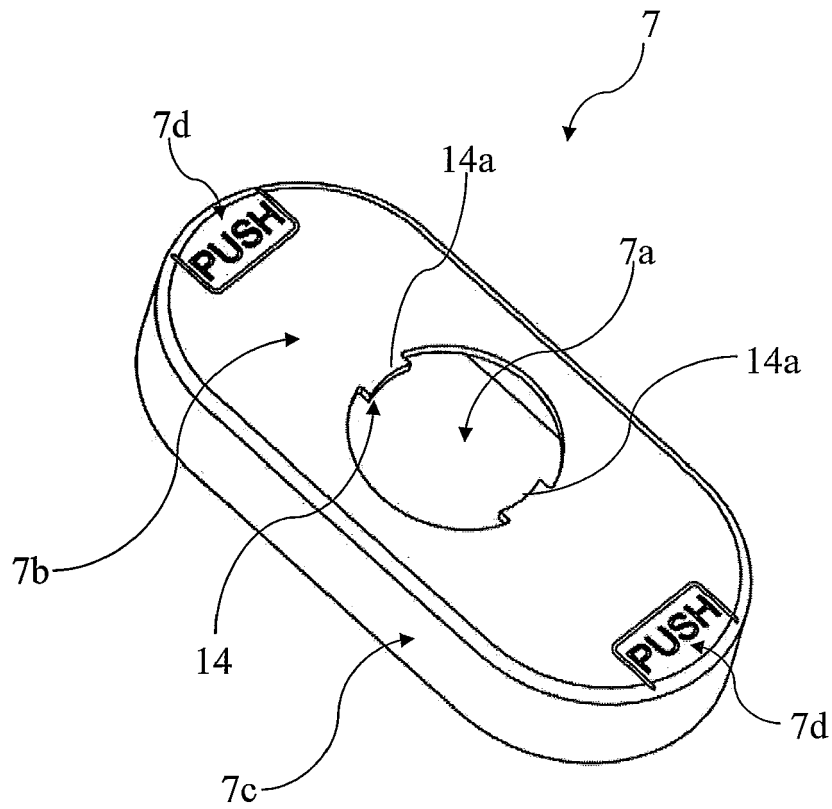


Fig. 6

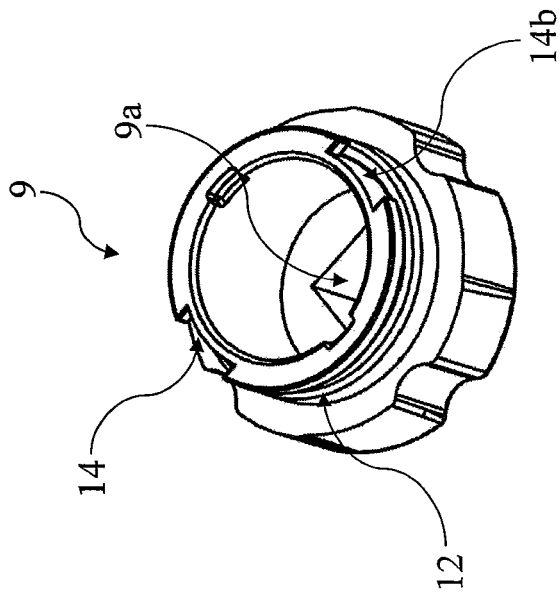


Fig. 7A

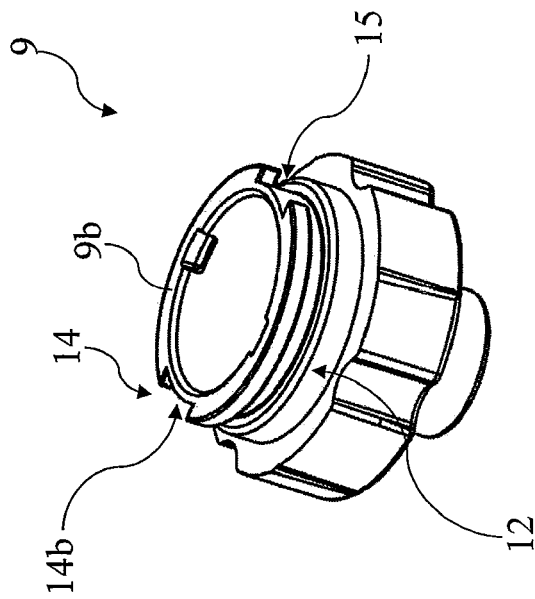


Fig. 7B

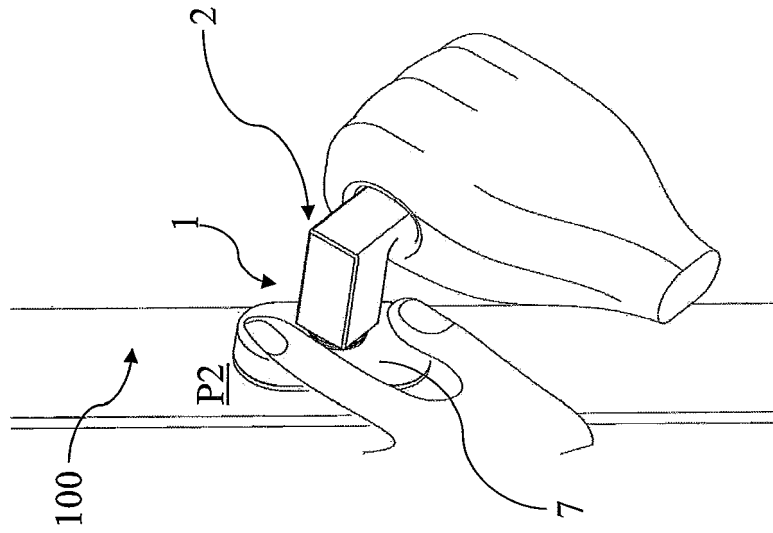


Fig. 8B

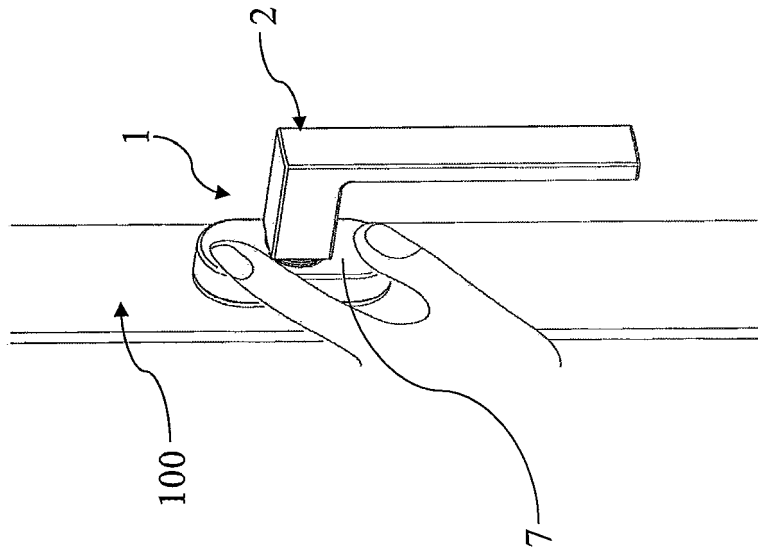


Fig. 8A



EUROPEAN SEARCH REPORT

Application Number
EP 16 17 4786

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 26 25 779 A1 (EIGEMEIER WILLI) 15 December 1977 (1977-12-15)	13,14,16	INV. E05B13/00
Y	* the whole document *	1-8,11, 12,15	E05B65/00
A	-----	9,10	ADD. E05B15/04
Y	US 30902 A (JOHN ADT) 11 December 1860 (1860-12-11) * the whole document *	1-8,11, 12,15	
Y	US 856 558 A (VOIGHT HENRY G [US]) 11 June 1907 (1907-06-11) * the whole document *	1-8,11, 12,15	
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			TECHNICAL FIELDS SEARCHED (IPC)
			E05B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 7 October 2016	Examiner Ansel, Yannick
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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ON EUROPEAN PATENT APPLICATION NO.**

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The members are as contained in the European Patent Office EDP file on
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07-10-2016

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US 30902	A	11-12-1860	NONE
US 856558	A	11-06-1907	NONE
US 303467	A	12-08-1884	NONE

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