

(19)



(11)

EP 3 272 978 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
24.01.2018 Bulletin 2018/04

(51) Int Cl.:
E05C 17/50^(2006.01)

(21) Application number: **17181464.3**

(22) Date of filing: **14.07.2017**

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

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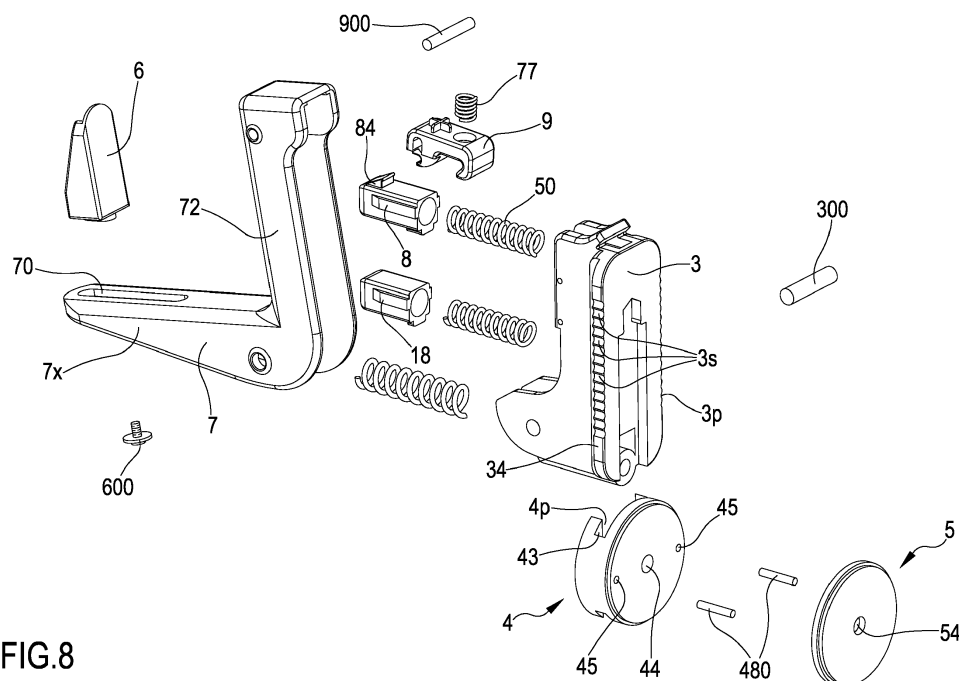
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(30) Priority: **18.07.2016 IT 201600074998**

(54) DEVICE FOR BLOCKING CASINGS

(57) The object of the present invention is a blocking device (1) for casings (100) comprising: a body (3) that is removably engageable with a supporting surface (102), a bracket (7) pivoted on the body (3) so as to be able to adopt with respect to said body (3) an operative position and a rest position and a pusher (8) partially housed in a seat (39) of the body (3) so as to be able to translate with respect to the body (3). According to the present invention, the blocking device (1) further comprises a lever (9) pivoted on the bracket (7), the lever (9) and the

body (3) comprise reciprocal hooking means (9a, 3a) that are suitable for maintaining the bracket (7) in the operative position, the lever (9) and the pusher (8) comprise reciprocal abutment means (9b, 8b) that are suitable for implementing rotation of the lever (9) with respect to the bracket (7) by an amount that is such as to disengage the hooking means (9a, 3a) and consequently cause the bracket (7) to switch from the operative position to the rest position.

**FIG.8****EP 3 272 978 A1**

Description

[0001] The present invention relates to a blocking device for casings, in particular shutters, windows, doors, wings and/or the like.

[0002] As is known, shutters and/or similar casings use fixed structures and movable structures that protect/obscure doors and windows and create a barrier against atmospheric agents such as rain and wind. The shutters are normally fitted with suitable blocking devices, also known as stops, which enable the shutters to be kept in the maximum open position.

[0003] The most widespread blocking devices consist of tilting hooking elements that engage corresponding hooking rings for blocking the shutters in the open position. The shutters are unblocked by acting manually on the respective hooking elements to disengage said hooking elements from the respective hooking rings. Once the shutters are unblocked, they can be moved and carried to the closed position.

[0004] Blocking devices also exist that are more evolved than traditional hooking elements that provide a blocking mechanism that snaps shut when the movable structure of the shutter reaches the maximum open position. In this case, the shutter interacts with the blocking mechanism that retains the shutter in the position reached. The shutter is unblocked by acting on at least one control element that removes the stop, enabling the shutter to be returned to the closed position.

[0005] Patent EP 0 823 524 B1 makes known one embodiment of such advanced blocking devices for casings. The device disclosed in this document comprises a bracket pivoted on a support body, so as to be able to adopt a first stable position with respect to the body in which it is able to lock a wing of a shutter and a second stable position in which it does not interfere with the rotation of the wing. With the bracket a piston is then associated that is movable with respect to the bracket countering a spring, with the function of damping the impacts of the wing on the blocking device. The transit of the bracket from the first stable position to the second stable position occurs following a manual action by the user, who presses a trigger obtained in an end portion of an unblocking lever, such that the unblocking lever rotates away from the bracket.

[0006] Although the blocking device specified in document EP 0 823 524 B1 enables secure blocking of the wing owing to the stability of the first position of the wing and effective damping of the impacts through the expelling thrust exerted on the piston by the countering spring thereof, the Applicant has ascertained that this device is not absent from drawbacks mainly connected to providing the manual unblocking mechanism with a trigger and that it is thus improvable mainly in relation to ease of use during the steps that are necessary for unblocking the wings, and in relation to the speed, immediacy and automaticity in unblocking of such wings. It must be added that the Applicant has noticed that the manual unblocking

mechanism not only adversely affects the ergonomic features of the device but also has the drawback of hardly being safe for the user: in fact, in order to enable manual unblocking by the trigger, the user has to lean out excessively from the window, in a potentially hazardous manner and to a potentially hazardous extent. In fact the blocking device disclosed in document EP 0 823 524 B1 has problems of long-term reliability, the unblocking mechanism with which the blocking device is provided being particularly sensitive to deterioration of performance because, for example, of wear and atmospheric phenomena.

SUMMARY OF THE INVENTION

[0007] The main object of the present invention is to provide a blocking device for casings, in particular shutters, windows, doors, wings and/or the like, that is able to solve the problems encountered in the prior art, overcoming in particular the drawbacks complained about with regard to the blocking device disclosed in document EP 0 823 524 B1.

[0008] A further object of the present invention is to make the operations of blocking and unblocking the wings of the shutters more convenient and easier.

[0009] Another object of the present invention is to propose a blocking device that is distinguished by greater safety in use.

[0010] It is also an object of the present invention to speed up unblocking of the wings and thus the operations of closure of the shutters.

[0011] Another object of the present invention is to propose a blocking device with reduced sensitivity to declines in performance over time.

[0012] One object of the present invention is also to propose a flexible blocking device that is able to ensure effective and secure blocking of the wings, regardless of the thickness of the wings.

[0013] Lastly, one object of the present invention is to propose a blocking device that enables the fitter to remedy possible positioning errors committed in fixing the blocking device to a building structure such as, for example, the outer wall of a building.

[0014] The objects of the present invention are deemed to be achieved by a blocking device for casings, in particular shutters, windows, doors, wings and/or the like of the type according to claim 1.

[0015] According to the present invention, the blocking device further comprises a movably constrained lever, in particular pivoted, on said bracket (7) so as to be able to move, in particular rotate, in relation to the bracket, movement of the lever with respect to the bracket occurring in the movement plane.

[0016] According to the present invention, the lever and the pusher comprise reciprocal abutment means, the abutment means being suitable for enabling the lever to be (for example manually) activated.

[0017] Advantageously, the blocking device compris-

es first elastic means (such as a first spring) that are suitable for countering rotations of the bracket that tend to take the bracket to the operative position and second elastic means (such as a second spring) that are suitable for countering translations of the pusher that tend to make the pusher approach the body.

[0018] Advantageously, the abutment means comprise a first abutment surface that is integral with the pusher and a second abutment surface that is integral with the lever, the first abutment surface pushing on the second abutment surface during the further approach of the pusher to the body. Further, the abutment means comprise a projection applied to the first abutment surface and a notch obtained on the second abutment surface, the respective outlines of the projection and the recess making a cam coupling that is such as to provoke rotation of the lever with respect to the bracket during the further approach of the pusher to the body. Advantageously, the pusher and the body comprise respective guide means that is suitable for translating the pusher with respect to the body along the sliding direction, during the first approach and during the further approach.

[0019] Advantageously, the hooking means comprise a shaped end of the lever and a housing obtained on the body, the respective geometries of the end and of the housing forming a shape-coupling so that the end is stably inserted into the housing when the bracket is in the operative position and such that the end and the housing do not interfere with one another during rotations of the bracket to the rest position.

[0020] Advantageously, the body comprises a guiding surface of the end, the end sliding on the guiding surface during the rotations of the bracket to the operative position, the respective outlines of the end and of the guiding surface making a cam coupling that is such as to cause a rotation of the lever with respect to the bracket that is suitable for enabling the end to be inserted into the housing. Advantageously, the body comprises a bearing surface and the lever comprises a limit surface, the bracket in the rest position contacting both the bearing surface, and the limit surface.

[0021] Advantageously, the blocking device comprises also at least one auxiliary pusher partially housed in an auxiliary seat of the body so as to be able to translate with respect to the body along a predetermined sliding direction, the sliding of the pusher with respect to the body occurring along a direction that is substantially parallel to the sliding direction of the at least one auxiliary pusher with respect to the body. The sliding of the auxiliary pusher preferably counters a third spring. Advantageously, the bracket comprises a slot, the direction of development of the slot being preferably longitudinal, so as to be substantially orthogonal to the supporting surface in the operative position of the bracket.

[0022] Advantageously, the stop is applied directly to the bracket, the slot being suitable for enabling the distance of the stop from the supporting surface to be adjusted.

[0023] Advantageously, the stop is applied indirectly to the bracket by an appendage that is removably engageable on the bracket. The appendage includes connecting means for connecting to the bracket, the appendage preferably engaging the bracket by shape-coupling between the slot and the connecting means so as to place the appendage flush with the portion of the bracket on which the slot is obtained. The appendage includes also a slot that is suitable for adjusting the distance of the stop from the supporting surface, the direction of development of the slot being preferably longitudinal, so as to be substantially orthogonal to the supporting surface in the operative position of the bracket.

[0024] Advantageously, the body comprises at least one through hole, the axis of which is substantially perpendicular to the supporting surface, the through hole of the body being able to house a fixing device such as a screw, a nail, a grub screw or the like that is usable to fix the body to the supporting surface.

[0025] Advantageously, the blocking device further comprises a supporting element that is applicable directly or indirectly to the supporting surface by a fixing hole, the fixing hole of the supporting element being able to house a fixing device such as a screw, a nail, a grub screw or the like, the supporting element and the body comprising reciprocal positioning means, which are suitable for enabling a manual variation of the position of the body along an adjusting direction substantially orthogonal to the sliding direction of the pusher. The positioning means include at least one ribbing projecting from the body and at least one groove obtained on the supporting element, the at least one ribbing and the at least one groove being shape-coupled with one another.

[0026] Advantageously, the supporting element and the body comprise reciprocal stabilizing means, which are suitable for enabling the body to be fixed to the supporting element. The stabilizing means include a plurality of indentations obtained on at least one ribbing, and at least one through hole obtained on the supporting element at a distance from the groove that is such that a fixing device such as a screw, a nail, a grub screw or the like, crossing the at least one through hole of the supporting element engages stably one of the indentations. Advantageously, the supporting element is applied indirectly to the supporting surface by a spacer element comprising a positioning edge that is suitable for connecting the spacer element to the supporting element, the geometry of the positioning edge being such as to make a shape coupling with a corresponding positioning edge obtained on the supporting element, and a concave fixing hole obtained in a position that is such as to be substantially coaxial with the fixing hole of the supporting element when the positioning edge of the spacer element engages the positioning edge of the supporting element.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] There now follows, by way of non-limiting ex-

ample, a detailed description of a preferred embodiment of a device for blocking casings, in particular shutters, windows, doors, wings and/or the like.

[0028] This description will be set out below with reference to the attached drawings, provided solely for indicative and therefore non-limiting purposes, in which:

- figure 1 is a schematic view of a casing for exteriors and of a building structure to which two blocking devices according to the present invention are applied;
- figures 2 to 7 constitute a series of section views showing first an unblocking and then a blocking sequence of a wing of a casing from and to a building structure, by a blocking device according to the present invention;
- figure 8 is an exploded axonometric view of a blocking device according to the present invention;
- figure 9 is a section view of some components of the blocking device shown in figure 8;
- figure 10 is a partially exploded axonometric view of a blocking device according to a version of the present invention.

DETAILED DESCRIPTION

[0029] With reference to figures 1 to 10, with number 1 is generally indicated a blocking device for casings, in particular shutters, windows, doors, wings and/or the like, according to the present invention.

[0030] As can be seen in the figure 1, the blocking device 1 is associable with a casing 100, such as for example a shutter, a window, a door, a wing and the like and/or a building construction 101, like a house, a block of flats or any alternative structure. Still with reference to figure 1, the building construction 101 has at least one wall that acts as a supporting surface 102 on which the casing 100 is operatively engaged. Each casing 100 comprises at least one wing that acts as a movable structure 103, which is able to adopt a closed position, in which it substantially lies on the same lying plane as the supporting surface 102 of the building construction 101, closing the respective door or window, and an open position, in which it lies on a plane which is transverse or preferably on a plane substantially parallel to the lying plane of the supporting surface 102 of the building construction 101.

[0031] In the open position of the movable structure 103, part of the blocking device 1 mentioned above remains operatively interposed between the movable structure 103 and the supporting surface 102, whereas part of the blocking device 1 is at a distance from the supporting surface 102 that is greater than the distance of the movable structure 103 from the supporting surface 102, thus ensuring blocking of the movable structure 103 in the open position.

[0032] The blocking device 1 comprises a body 3 that is suitable for engaging the supporting surface 102 to support the functional components of the device 1. Engaging the body 3 on the supporting surface 102 is ad-

vantageously of removable type and can for example be achieved by a screw that is integral with the body 3 that is to be fixed to the wall. Alternatively, the body 3 can engage the supporting surface 102 by an advantageous technical solution that enables the height adjustment thereof and will be disclosed in detail below. The body 3 preferably consists of a single piece made of plastics, essentially having a square shape in a plan view but suitably shaped to interface with the remaining components of the blocking device 1.

[0033] A bracket 7 is pivoted on the body 3 by a pivot 300 that enables the bracket 7 to rotate relative to the body 3 within a movement plane that is substantially orthogonal to the supporting surface 102. The body 3 is engaged on the supporting surface 102 with an orientation that is such that the pivot 300 is applied to the lowest portion of the body 3. The bracket 7 preferably consists of a single piece made of plastics, being substantially "L"-shaped when viewed from the side, comprising a first portion 7z that develops prevalently in height and covers the body 3 owing to a suitable shape coupling and a second portion 7x that develops prevalently in depth, thus distancing itself from the supporting surface 102. The pivot 300 is applied to the bracket 7 in an intermediate portion between the first portion 7z and the second portion 7x. At the end of the first portion 7z, a ridge 85 is advantageously shaped that is suitable for coming into contact with the movable structure 103 when the bracket 7 is in the rest position.

[0034] A stop 6 is arranged at the end of the second portion 7x of the bracket 7. In the embodiment illustrated in the figures, the stop 6 consists of a separate element the base of which rests on the bracket 7 and is connected thereto by a screw 600. Nevertheless, the stop 6 can also be obtained as one piece with the bracket 7. Advantageously, positioning of the stop 6 in relation to the second portion 7x of the bracket 7 is adjustable in order to enable the fitter of the blocking device 1 to vary the distance between the stop 6 and the first portion 7x of the bracket 7. This adjustable positioning is obtained by a slot 70 obtained longitudinally in the second portion 7x of the bracket 7. It should be emphasised that providing the slot 70 in the blocking device 1 (in order to enable the blocking device 1 to be adapted to different thicknesses of the movable structure 103) constitutes an inventive feature in itself. One special feature of the bracket 7 resulting from the degree of rotational freedom thereof is that of being able to adopt an operative position and a rest position in relation to the body 3, the operative position being for example shown in figure 2 and the rest position being shown for example in figure 6. In the operative position of the bracket 7, the stop 6 interferes with the rotation of the movable structure 103 that is blocked in the open position, whereas in the rest position of the bracket 7 blocking of the movable structure 103 is inhibited in the open position, as the stop 6 does not interfere with the rotation of the movable structure 103. It should be noted that if the bracket 7 comprises the slot 22 for adjusting

the distance of the stop 6 from the supporting surface 102, this slot 22 is substantially orthogonal to the supporting surface 102 in the operative position of the bracket 7.

[0035] The blocking device 1 is designed in such a manner that the bracket 7 tends to go to the rest position when it is in any intermediate position between the operative position and the rest position. For this purpose, the blocking device 1 comprises a spring 40, interposed between the body 3 and the bracket 7 and suitable for countering possible rotations of the bracket 7 that tend to take the bracket 7 to the operative position. In order to make the rest position of the bracket 7 a position of stable equilibrium, the body 3 comprises at least one bearing surface 31 for the bracket 7. In the embodiment shown in figure 8, the bearing surface 31 is obtained by a pair of supports 310 that lead away from the body 3 and on which the second portion 7x of the bracket 7 comes to rest.

[0036] The blocking device 1 further comprises a pusher 8, which is partially housed in a seat 39 obtained in the body 3 and partially protrudes from the body 3, crossing a suitable opening 700 obtained in the bracket 7. The seat 39 is shaped in such a manner that the pusher 8 can translate with respect to the body 3 along a predetermined sliding direction, which lies on or is substantially parallel to the movement plane of the bracket 7. The blocking device 1 is designed in such a manner as to counter possible translations of the pusher 8 that tend to approach the body 3, i.e. counter possible translations of the pusher 8 that tend to counter the part of the pusher 8 that protrudes from the body 3. For this purpose, the blocking device 1 comprises a spring 50, housed in the seat 39 and in contact with the pusher 8, the spring 50 exerting an expelling thrust for expelling the pusher 8 from the body 3. The pusher 8 and the seat 39 are shape-coupled with one another: in the embodiment shown in the figures, they both have a square section, nevertheless it is obvious that different shapes are possible (specifically with a rectangular section or elliptic section). Advantageously, the pusher 8 and the body 3 comprise respective guide means that is suitable for directing the translating movements of the pusher 8 with respect to the body 3: for example, this guide means can comprise a pair of sides 84 that project from the upper surface 801 of the pusher 8, the sides 84 being constrained, during sliding of the pusher 8, by the adjacency of corresponding sides 34 that are integral with the body 3. As will be better illustrated below, during the detailed description of the sequence specified in figures 2 to 7, when the movable structure 103 is taken to the open position, it abuts on the head 800 of the pusher 8 and drags the head 800 during the approach to the supporting surface 102 in such a manner that a first approach of the pusher 8 to the body 3 occurs automatically. The expelling thrust of the spring 50 means that the head 800 of the pusher 8 remains abutting on the movable structure 103 in the open position of the movable structure 103.

[0037] The blocking device 1 according to the present invention further comprises a lever 9 pivoted on the bracket 7 by a pivot 900 that enables rotation of the lever 9 with respect to the bracket 7, the rotation axis of the lever 9 with respect to the bracket 7 being substantially parallel to the rotation axis of the bracket 7 with respect to the body 3. The lever 9 that is thus pivoted exits the bracket 7 approaching the supporting surface 102. The pivot 900 is applied to the first portion 7z of the bracket 7 in a position that is such that the lever 9 is above the body 3 and for which reason the pivot 300 for rotation of the bracket 7 in relation to the body 3 is further from the lever 9 than from the pusher 8.

[0038] The lever 9 and the body 3 comprise reciprocal hooking means, having the function of retaining the bracket 7 in the operative position. These hooking means comprise a hooking portion 9a that is integral with the lever 9 and a hooking portion 3a that is integral with the body 3, the hooking portion 9a being hooked to the hooking portion 3a when the bracket 7 is in the operative position and being on the other hand unhooked from the hooking portion 3a when the bracket 7 is in the rest position. Advantageously, the hooking portion 9a that is integral with the lever 9 is obtained by suitably shaping an end 92 of the lever 9 (for example by folding this end 92 as a hook, so as to create a protruding outline that is parallel to the pivot 900), whereas the hooking portion 3a that is integral with the body 3 is obtained by making a suitable housing 32 on the body 3 (for example by creating a recess in the upper wall 320 of the body 3). The geometry of the end 92 is shape-coupled with the geometry of the housing 32, such that the end 92 is stably inserted into the housing 32 when the bracket 7 is in the operative position (thus ensuring the stability of the permanence of the bracket 7 in the operative position) and such that the end 92 and the housing 32 do not create reciprocal interference during rotations of the bracket 7 to the rest position (thus not obstructing the transit of the bracket 7 from the operative position to the rest position). In order to make the insertion of the end 92 into the housing 32 (and consequently the permanence of the bracket 7 in the operative position) more stable, between the bracket 7 and the lever 9 a safety spring 77 can be advantageously interposed that is able to compel the lever 9 to press against the body 3.

[0039] It must be emphasized that what has just been disclosed constitutes only one embodiment of the hooking means, it being equivalently possible to obtain a protruding outline that is one piece with the body 3 and to obtain a recess on a surface of the lever 9.

[0040] The hooking means thus ensure that the lever 9 can switch between an interfering position (associated with the operative position of the bracket 7) and a non-interfering position (associated with the rest position of the bracket 7). The non-interfering position is defined by a limit 93 surface obtained on the lever 9, that contacts the bracket 7 when the bracket 7 is in the rest position. The arrangement of the lever 9 in the non-interfering po-

sition can occur through gravity; nevertheless, if the blocking device 1 comprises the previously disclosed safety spring 77, this safety spring 77 is also of assistance in facilitating this arrangement in a non-interfering position.

[0041] The upper surface of the body 3 acts as a guiding surface 33 for the end 92 of the lever 9, on which the end 92 slides when the lever 9 is moved in the direction of the body 3, or when the bracket 7 is rotated to the operative position. Advantageously, the guiding surface 33 has a ramp form, in order to rotate the lever 9 during sliding on the guiding surface 33, so that the end 92 is raised and is in this manner directed to the housing 32, where it can be finally inserted after travelling along the entire guiding surface 33. The lever 9 and the pusher 8 comprise reciprocal abutment means, which have the function of enabling the lever 9 to be manually activated so as to take the bracket 7 from the operative position to the rest position. Advantageously, the lever 9 is activated by a pressure exerted by the user on the movable structure 103 that makes the movable structure 103 approach the supporting surface 102. Accordingly, the task that the user has to perform is significantly ergonomic, as the pressure can be exerted at any point of the movable structure 103, and is extremely safe as the user does not have to lean out at all from the window to exert this pressure.

[0042] Preferably, the abutment means comprise an abutment portion 9b that is integral with the lever 9 and an abutment portion 8b that is integral with the pusher 8. Specifically, the abutment portion 8b that is integral with the pusher 8 comprises a first abutment surface 80 to which a projection 81 is applied, whereas the abutment portion 9b that is integral with the lever 9 comprises a second abutment surface 90 on which a recess 91 is obtained. For example, the first abutment surface 80 is made on the upper surface 801 of the pusher 8 orthogonally to the sides 84, whereas the second abutment surface 90 is made by suitably shaping a portion of the lever 9 that is distinct from the ends 92. The outline of the projection 81 is joined to the outline of the recess 91, in such a manner that the two outlines, when they are in contact with one another, form a cam coupling, in which the projection 81 acts in particular as a tappet. The cam coupling between the projection 81 and the recess 91 is able, when the projection 81 runs along the surface of the recess 91, to cause the lever 9 to rotate with respect to the bracket 7.

[0043] The abutment means that enable the lever 9 to be activated manually (for example following pressure exerted by the user on the movable structure 103 intended to make the lever 9 approach the supporting surface 102), to take the bracket 7 from the operative position to the rest position, cause a further approach of the pusher 8 to the body 3, as can be seen clearly in the sequence shown in figures 2 to 7. The pressure exerted by the user on the movable structure 103 is transmitted to the pusher 8, as the head 800 of the pusher 8 abuts on the movable

structure 103 when the latter is in the open position and determines the further approach of the pusher 8 to the body 3. During this further approach, the first abutment surface 80 that is integral with the pusher 8 pushes on the second abutment surface 90 that is integral with the lever 9 during the further approach of the pusher 8 to the body 3. Accordingly, the cam coupling existing between the projection 81 and the recess 91 causes the lever 9 to rotate with respect to the bracket 7, so that the lever 9 tends to move to the non-interfering position during the aforesaid further approach of the pusher 8 to the body 3, the constraint being thus neutralized between the lever 9 and the body 3 that is produced by the hooking means. The final result of the further approach of the pusher 8 to the body 3 is thus of taking the bracket 7 to the rest position, thus obtaining the release of the movable structure 103 that can be returned by the user to the closed position.

[0044] For greater clarity, referring to the sequence in figures 2 to 7, the unlocking and locking processes of the movable structure 103 by the blocking device 1 according to the present invention are now disclosed. In figure 2, the movable structure 103, i.e. a wing of the casing 100, is retained in the open position, the bracket 7 being in the operative position in which the stop 6 prevents the movable structure 103 from rotating. The bracket 7 is positioned in the operative position by the hooking means, the end 92 of the lever 9 being stably inserted into the housing 32 of the body 3 and the lever 9 not being thus able to move from the interfering position. In figure 3, the user exerts a pressure on the movable structure 103 in the direction of the supporting surface 102, this pressure being aimed at unlocking (and presumably the subsequent closing) of the movable structure 103. The pressure on the movable structure is such as to move the pusher 8 to the body 3 (compressing the spring 50), so as to place the abutment portion 8b that is integral with the pusher 8 in contact with the abutment portion 9b that is integral with the lever 9. The projection 81 then starts to cooperate with the recess 91, causing a rotation of the lever 9 around the pivot 900 that is sufficient to make the end 92 exit the housing 32. In figure 4, the user terminates the pressure on the movable structure 103. Thus the previously compressed spring 50 can, through the head 800 of the pusher 8, exert a thrust on the movable structure 103 that aims to remove the movable structure 103 from the body 3 (and thus from the supporting surface 102). The bracket 7 then starts to rotate around the pivot 300 to move to the rest position, assisted by the thrust provided by the spring 40. In figure 5, the bracket 7 is in the rest position, in which the stop 6 cannot interfere with rotation of the movable structure 103. The limit 93 surface of the lever 9 makes contact with the bracket 7, which in turn lies on the bearing surface 31 of the body 3. The user then intends to return the movable structure 103 to the open position and thus make the movable structure 103 approach the supporting surface 102. In figure 6, the movable structure 103, after coming into

contact with the ridge 85 on the bracket 7, rotates the bracket 7 around the pivot 300 to return the bracket 7 to the operative position. Rotating the bracket 7 makes the lever 9 approach the supporting surface 102 and the end 92 of the lever starts to slide on the guiding surface 33. This sliding causes the lever 9 to rotate around the pivot 900 and the end 92 to lift up. Simultaneously, the movable structure 103 comes into contact with the pusher 8 and causes the pusher to approach the body 3. In figure 7, the end 92 has completed sliding on the guiding surface 33 and is thus able to be inserted into the housing 32 to make the operative position of the bracket 7 stable and thus lock the movable structure 103 in the open position. The end 92 can be inserted into the housing 32 simply by gravity, or can be facilitated by the safety spring 77. The sequence of unblocking and subsequently blocking the movable structure 103 then ends with the return of the blocking device 1 to the condition shown in figure 2.

[0045] A series of variations is now presented that show possible advantageous embodiments of the present invention. It should be pointed out that although such versions will be disclosed below in combination with the invention according to claim 1, each of these versions has an inventive content independently that can also be used separately from the features according to claim 1.

[0046] According to a first version, the blocking device 1 comprises at least one auxiliary pusher 18 to assist the pusher 8 dampen the impact of the movable structure 18 at the time that the movable structure 103 reaches the open position (i.e. at the time shown in figure 6). The auxiliary pusher 18 is preferably arranged below the pusher 8, such that the symmetry of the blocking device 1 is maintained. The auxiliary pusher 18 can be arranged differently with respect to the pusher 8: for example it can be arranged to the side of the pusher 8. The auxiliary pusher 18 is preferably of the same shape as the pusher 8, except that it obviously does not have any characteristic for interacting with the lever 9. The auxiliary pusher 18 is partially housed in an auxiliary seat 38 of the body 3 so as to be able to translate with respect to the body 3 along a predetermined sliding direction. The sliding of the auxiliary pusher 18 in relation to the body 3 occurs along a direction that is substantially parallel to the sliding direction of the pusher 8 with respect to the body 3. A spring 60 is lastly associated with the auxiliary pusher 18 to counter the approach of the auxiliary pusher 18 to the body 3. This spring 60 then exerts an expelling thrust that enables the auxiliary pusher 18 to assist the pusher 8 also at the time of the removal of the movable structure 103 (or at the time shown in figure 4).

[0047] According to a second version (shown in figure 10), the blocking device 1 comprises an appendage 2 to enable the movable structure 103 to be blocked if the movable structure 103 is distinguished by a significant thickness. The stop 8 is then applied indirectly to the bracket 7 by means of the appendage 2, which is removably engaged on the bracket 7. In order to obtain this engagement between the appendage 2 and the bracket

7, the appendage 2 includes connecting means 21 that are shape-coupled with the slot 70. Advantageously, the connecting means 21 comprises a protrusion 210 that is counter-shaped on the slot 70 and protrudes from a lowered portion 211 of the upper surface of the appendage 2. The difference in height between the lowered portion 211 and the upper surface 212 of the appendage 2 is substantially equal to the thickness of the second portion 7x of the bracket 7 in the region in which the slot 70 is obtained. In this manner, the appendage 2 is mounted substantially flush with the second portion 7x of the bracket 7. An example of fixing of the appendage 2 to the bracket 7 is provided by way of non-limiting example in which a pair of screws 240 are inserted into a pair of holes 213 obtained in the protrusion 210. Fixing the stop 6 to the appendage 2 can advantageously reproduce the fixing of the stop 6 to the bracket 7. In fact, a slot 22 is obtained in the bracket 7, with a preferably longitudinal direction of development that is suitable for enabling the distance of the stop 6 to be adjusted (fixed to the appendage 2 for example by a screw 603) by the supporting surface 102. Alternatively, the stop 6 can be obtained as one piece with the appendage 2, in which case the appendage 2 would not need to be provided with the slot 22. According to a third version, the blocking device 1 further comprises a supporting element 4 for fixing the body 3 (and thus the entire blocking device 1) to the supporting surface 102. The supporting element 4 is preferably made in the form of a component made of plastics in the central region of which a fixing hole 44 is obtained that can house a fixing device such as for example the screw 450. In order to avoid there being a single fixing point of the blocking device 1 on the supporting surface 102 (or the point of application of the screw 450) and thus to avoid the entire blocking device 1, when in use, to rotate in an undesired manner around this point, at least one further fixing point 1 for fixing to the supporting surface 102 and suitable spacing between the two fixing points are advantageously provided. Preferably, the body 3 is thus provided with at least one through hole 30, for housing a fixing device such as for example the screw 350, which is useful for fixing the body 3 to the supporting surface 102 and increasing the anchoring stability of the blocking device 1 on the supporting surface 102. Reciprocal positioning means are provided between the supporting element 4 and the body 3, comprising at least one positioning portion 4p that is integral with the supporting element 4 and at least one positioning portion 3p that is integral with the body 3, and suitable for enabling manual variation of the position of the body 3 along an adjusting direction that is substantially orthogonal to the sliding direction of the pusher 7. Accordingly these positioning means assist the fitter during installation of the blocking device 1 to the wall: first, the fitter fixes the supporting element 4 by the screw 450 and applies the body 3 (with the remaining components of the blocking device 1) to the supporting element 4, then the fitter has the opportunity of checking whether the obtained positioning is optimum in function

of the positioning of the casing 100. If the answer is negative, the fitter has the possibility of adapting vertically (by a few mm or a few tenths of mm) the position of the body 3 and of the remaining components of the blocking device 1, including the bracket 7 and the stop 6.

[0048] Advantageously, the positioning means have a symmetrical shape and comprise a pair of ribbings 34 that protrude from the side surface 330 of the body 3 and a pair of grooves 43 that are obtained on the respective inner surfaces 430 of two side ridges 440 of the supporting element 4 (as can be seen clearly in the section view of figure 9). The ribbings 34 and the grooves 43 are shape-coupled together, such that the ribbings 34 (and the entire body 3 with them) can slide along the direction of development of the grooves 43. Preferably, the supporting element 4 and the body 3 have (in combination with the positioning pieces disclosed above) reciprocal stabilizing means, suitable for enabling the body 3 to be fixed on the supporting element 4, once the correct positioning has been defined. In particular, a plurality of indentations 3s, obtained on at least one of the ribbings 34 (preferably on both ribbings 34) and at least one through hole 45 obtained on the supporting element 4 near the groove 43 corresponding to least one of the ribbings 34 on which the indentations 3s are obtained, form part of the stabilizing means. Advantageously, the stabilizing means are symmetrical and thus the indentations 3s are obtained on both the ribbings 34 of the body 3 and there is one through hole 45 made on each of the side ridges 440 of the supporting element 4. The fitter of the fixing device 1, once the correct position of the body 3 with respect to the supporting element 4 has been determined, inserts a grub screw 480 (or a fixing device such as a screw, a nail or the like) into each through hole 45. The grub screw 480 crosses the through hole 45 and engages stably one of the indentations 3s, thus ensuring stable fixing of the body 3 to the supporting element 4. From the section view of figure 9, it is clearly seen how the fixing hole 45 engages a portion of the groove 43, so inserting the grub screw 480 into the fixing hole 45 necessarily creates interference between the grub screw 480 and one of the ribbings 34. In order to vary the positioning of the body 3 with respect to the supporting element 4, it is thus sufficient to remove the grub screw 480 from the through hole 45, translate the body 3 with respect to the supporting element 4 and lastly insert again the grub screw 480 into the through hole 45. Obviously, if the direct connection between the body 3 and the supporting surface 102 by the screw 350, in combination with the indirect connection by the supporting element 4 is provided, in order to vary the positioning of the body 3 with respect to the supporting element 4 it is also necessary to remove the screw 350 and then apply the screw 350 to the supporting surface 102 in a different position. The supporting element 4 has a predetermined thickness. If it is desired to install the blocking device 1 at a distance that is greater than this predetermined thickness, it is possible to apply the supporting element 4 indirectly to the supporting sur-

face 102 by a spacer element 5 (shown in figures 8 and 9). This spacer element 5 has a similar shape to the supporting element 4 when viewed from the front (for example a circular shape), with a fixing hole 54 that is substantially coaxial with the fixing hole 44 of the supporting element 4, so as to enable the screw 450 to cross the spacer element 5. Advantageously, in order to ensure stable application of the spacer element 5 to the supporting element 4, the spacer element 5 comprises a first positioning edge 51 that projects from the surface of the spacer element 5 facing the supporting element 4, whereas the supporting element 4 comprises a second positioning edge 41 that is made on the supporting element 4 facing the spacer element 5. The respective geometries of the first positioning edge 51 and of the second positioning edge 41 are shape-coupled together (for example they share the same quadrangular section).

ADVANTAGES OF THE INVENTION

[0049] First of all, the blocking device disclosed above makes the blocking and unblocking operations convenient, easy and fast inasmuch as it is sufficient to push the shutter to the supporting surface to ensure locking thereof in the open position and to push the shutter again against the supporting surface to unblock and return the shutter to the closed position. Further, the blocking device disclosed above ensures great safety in use, significant immunity to wear phenomena and ergonomic features that ensure maximum user comfort. These and further advantages are ensured by the blocking device according to the following claims, which constitute an integral part of the present description.

Claims

1. Device (1) for blocking casings (100), particularly shutters, windows, doors, wings and/or the like of a type comprising at least one structure (103) movable and rotatable between a closed position, in which it substantially lies on the same lying plane as a supporting surface (102) which it is engaged with, and an open position, in which it lies on a plane that is transverse or substantially parallel to the lying plane of said supporting surface (102), said blocking device (1) comprising:
 - i) a body (3) removably engageable with said supporting surface (102);
 - ii) a bracket (7) removably engaged, particularly pivoted, on said body (3) so that it can move, particularly rotate, with respect to said body (3), the movement of said bracket (7) with respect to said body (3) occurring in a movement plane transverse, substantially normal, to said supporting surface (102), so that it can adopt, with respect to said body (3), at least an operative

position and at least one rest position;

iii) a stop (6) applied directly or indirectly to said bracket (7), in said operative position of said bracket (7), said movable structure (103) being blocked in said open position by means of said stop (6) and in said rest position of said bracket (7) said movable structure (103) being prevented from blocking in said open position, and
iv) a pusher (8) partially housed in a seat (39) of said body (3) and movable, particularly by translation, with respect to said body (3) along a predetermined sliding direction, said sliding direction lying on or being substantially parallel to said movement plane, a first approaching of said pusher (8) to said body (3) automatically occurring when said movable structure (103) of said casing (100) is taken to said open position, said pusher (8) remaining in abutment against said movable structure (103) in the open position of said movable structure (103), **characterized by** the fact of further comprising a lever (9) movably constrained, particularly pivoted, on said bracket (7) so that it can move, particularly rotate, with respect to said bracket (7), the rotation of said lever (9) with respect to said bracket (7) occurring in said movement plane;

said lever (9) and said body (3) comprising reciprocal hooking means (9a, 3a), said hooking means (9a, 3a) being adapted to keep said bracket (7) in said operative position;

said lever (9) and said pusher (8) comprising reciprocal abutment means (9b, 8b),

said abutment means (9b, 8b) being suitable for enabling said lever (9) to be capable of being activated; a further approaching of said pusher (3) to said body (3) being capable of actuating, by said abutment means (9b, 8b), a movement, particularly by rotation, of said lever (9) with respect to said bracket (7) of an extent such to disengage said hooking means (9a, 3a) for consequently causing said bracket (7) to switch from said operative position to said rest position.

2. Blocking device (1) according to claim 1, comprising a first spring (40) suitable for countering rotations of said bracket (7) which tend to take it towards said operative position and a second spring (50) suitable for countering translations of said pusher (8) which tend to approach it to said body (3), and in which said pusher (8) and said body (3) comprise respective guiding means (84, 34) suitable for directing the translation of said pusher (8) with respect to said body (3) along said sliding direction, during said first approaching and during said further approaching.
3. Blocking device (1) according to any one of the preceding claims, wherein said abutment means (9b,

8b) comprise:

- a) a first abutment surface (80) integral with said pusher (8);
- b) a second abutment surface (90) integral with said lever (9), said first abutment surface (80) pushing said second abutment surface (90) during said further approaching of said pusher (8) to said body (3);
- c) a projection (81) applied to said first abutment surface (80), and
- d) a recess (91) made on said second abutment surface (90), the respective outlines of said projection (81) and recess (91) forming a cam-coupling such to cause said lever (8) to rotate with respect to said bracket (7) during said further approaching of said pusher (8) to said body (3).

4. Blocking device (1) according to any one of the preceding claims, wherein said hooking means (9a, 8a) comprise:

- a) a shaped end (92) of said lever (9), and
- b) a housing (32) obtained on said body (3), the respective shapes of said end (92) and said housing (32) forming a shape-coupling so that said end (92) is stably inserted in said housing (32) when said bracket (7) is in said operative position and so that said end (92) and said housing (32) do not interfere with each other during the rotations of said bracket (7) towards said rest position,

particularly said body (3) comprises a guiding surface (33) of said end (92), said end (92) sliding on said guiding surface (33) during the rotations of said bracket (7) towards said operative position, the respective outlines of said end (92) and guiding surface (33) forming a cam-coupling such to cause said lever (9) to rotate with respect to said bracket (7), suitable for enabling said end (92) to enter said housing (32).

5. Blocking device (1) according to any one of the preceding claims, wherein said body (3) comprises a bearing surface (31) and said lever (9) comprises a limit surface (93), said bracket (7) in said rest position contacting both said bearing surface (31) and said limit surface (93).
6. Blocking device (1) according to any one of the preceding claims, further comprising at least one auxiliary pusher (18) partially housed in an auxiliary seat (38) of said body (3) so as to be able to translate with respect to said body (3) along a predetermined sliding direction, said at least one auxiliary pusher (18) sliding, with respect to said body (3), along a direction substantially parallel to the sliding direction of said pusher (8) with respect to said body (3) and prefer-

ably against a third spring (60).

7. Blocking device (1) according to any one of the preceding claims, said bracket (7) comprising a slot (70), the development direction of said slot (7) being preferably a longitudinal development, so that is substantially orthogonal to said supporting surface (102) in said operative position of said bracket (7), particularly, said stop (8) is directly applied to said bracket (7), said slot (70) being suitable to enable to the distance of said stop (6) from said supporting surface (102) to be adjusted. 5
8. Blocking device (1) according to claim 7, wherein said stop (8) is indirectly applied to said bracket (7) by an appendage (2) removably engageable with said bracket (7), said appendage (2) including: 10
 - a) means (21) connecting to said bracket (7), the engagement of said appendage (2) with said bracket (7) preferably occurring by means of a shape-coupling between said slot (70) and said connecting means (21) for positioning said appendage (2) flush with the portion of said bracket (7) on which said slot (70) is made, and 20
 - b) a slot (22) suitable for enabling the distance of said stop (6) from said supporting surface (102) to be adjusted, the development direction of said slot (22) being preferably longitudinal, so that it is substantially orthogonal to said supporting surface (102) in said operative position of said bracket (7). 25 30
9. Blocking device (1) according to any one of the preceding claims, wherein said body (3) comprises at least one through hole (30), the axis of the through hole (30) of said body (3) being substantially perpendicular to said supporting surface (102), the through hole (30) of said body (3) being capable of housing a fixing device such as a screw, a nail, a grub screw or the like, useful for blocking said body (3) with respect to said supporting surface (102). 35 40
10. Blocking device (1) according to any one of the preceding claims, further comprising a supporting element (4) directly or indirectly applicable to said supporting surface (102) by a fixing hole (44), the fixing hole (44) of said supporting element (4) being capable of housing a fixing device such as a screw, a nail, a grub screw or similar, said supporting element (4) and said body (3) comprising reciprocal positioning means (4p, 3p), said positioning means (4p, 3p) being suitable for enabling a manual variation of the position of said body (3) along an adjustment direction substantially orthogonal to the sliding direction of the pusher (8), and including: 45 50 55

a) at least one ribbing (34) projecting from said

body (3), and

b) at least one groove (43) made on said supporting element (4), said at least one ribbing (34) and said at least one groove (43) being shape-coupled with each other,

particularly, said supporting element (4) and said body (3) comprising respective stabilizing means (4s, 3s), said stabilizing means (4s, 3s) being suitable for enabling said body (3) to be fixed to said supporting element (4), and including:

- a) a plurality of indentations (3s) made on said at least one ribbing (34), and
- b) at least one through hole (4s) made on said supporting element (4) at a distance from said groove (43) so that a fixing device such as a screw, a nail, a grub screw or the like, crossing the at least one through hole (4s) of said supporting element (4), stably engages one of said indentations (3s).

FIG.1

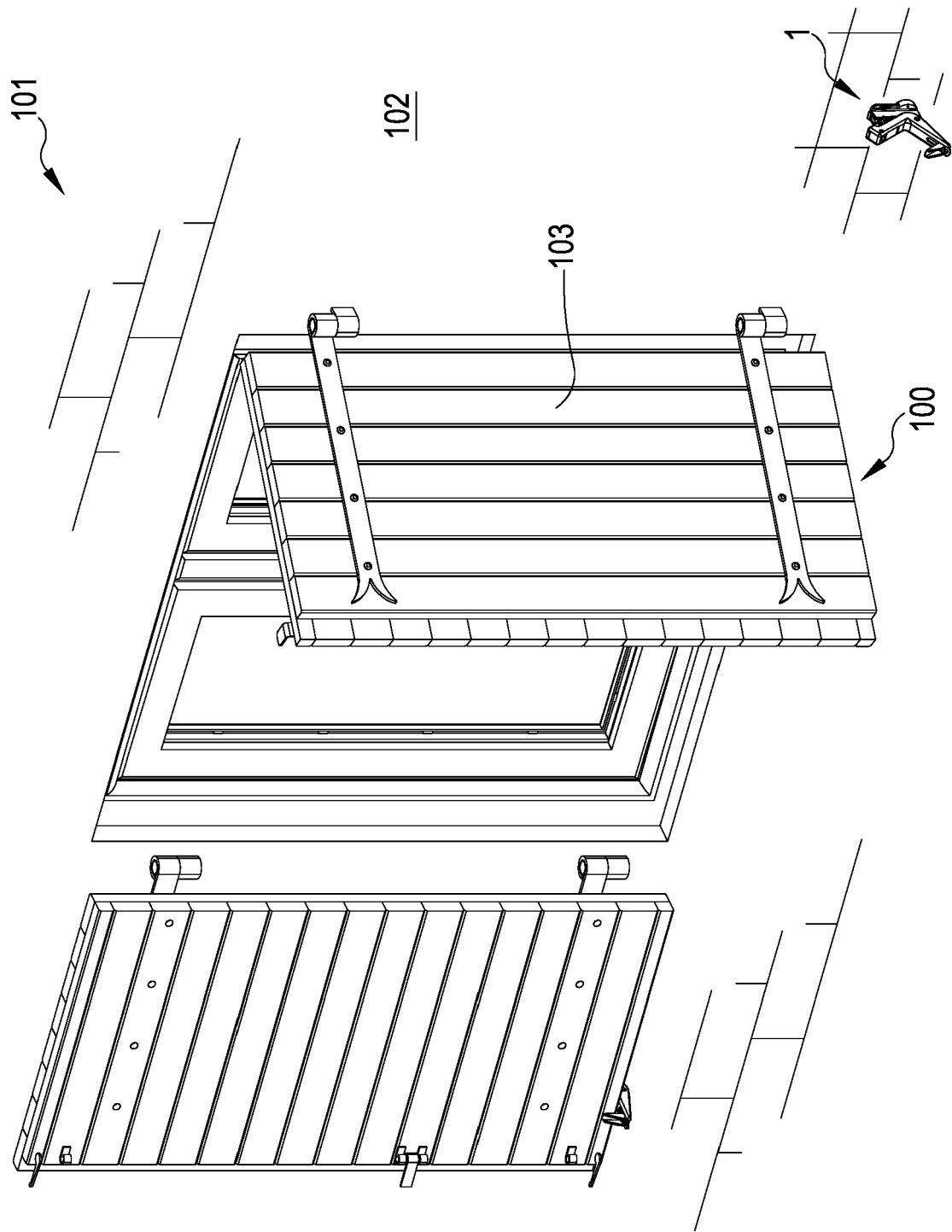


FIG.2

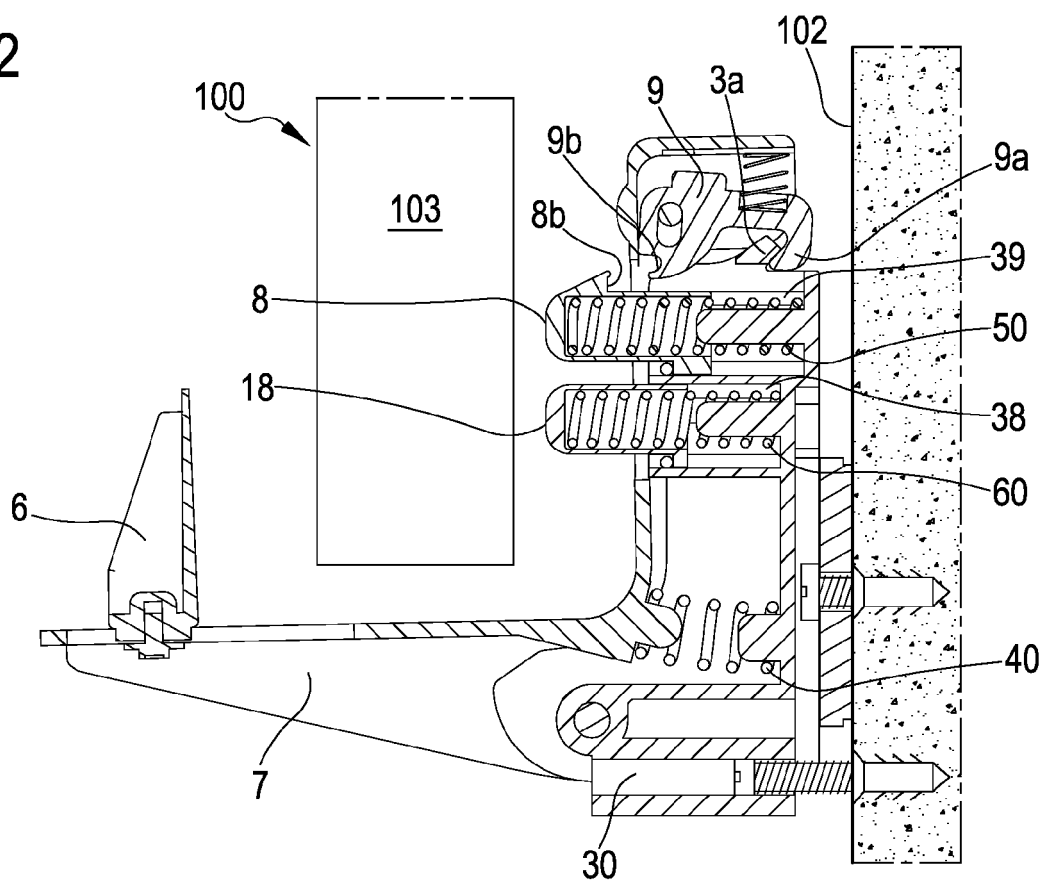


FIG.3

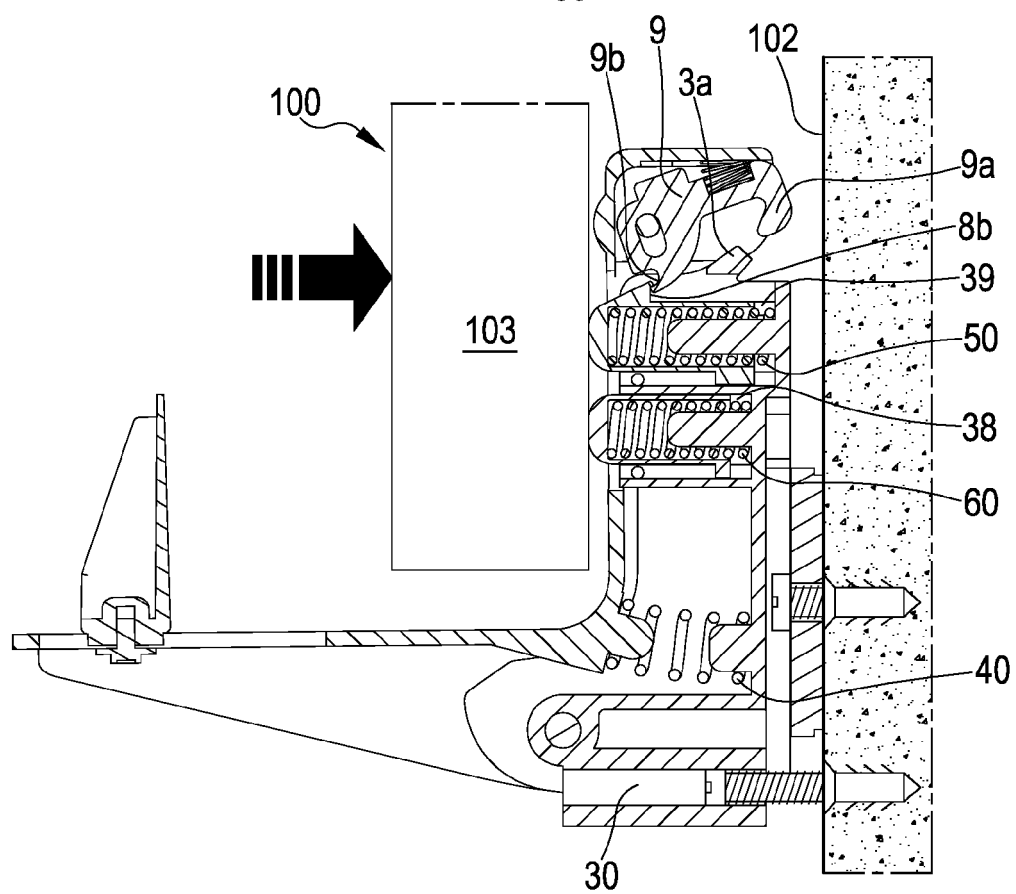


FIG.4

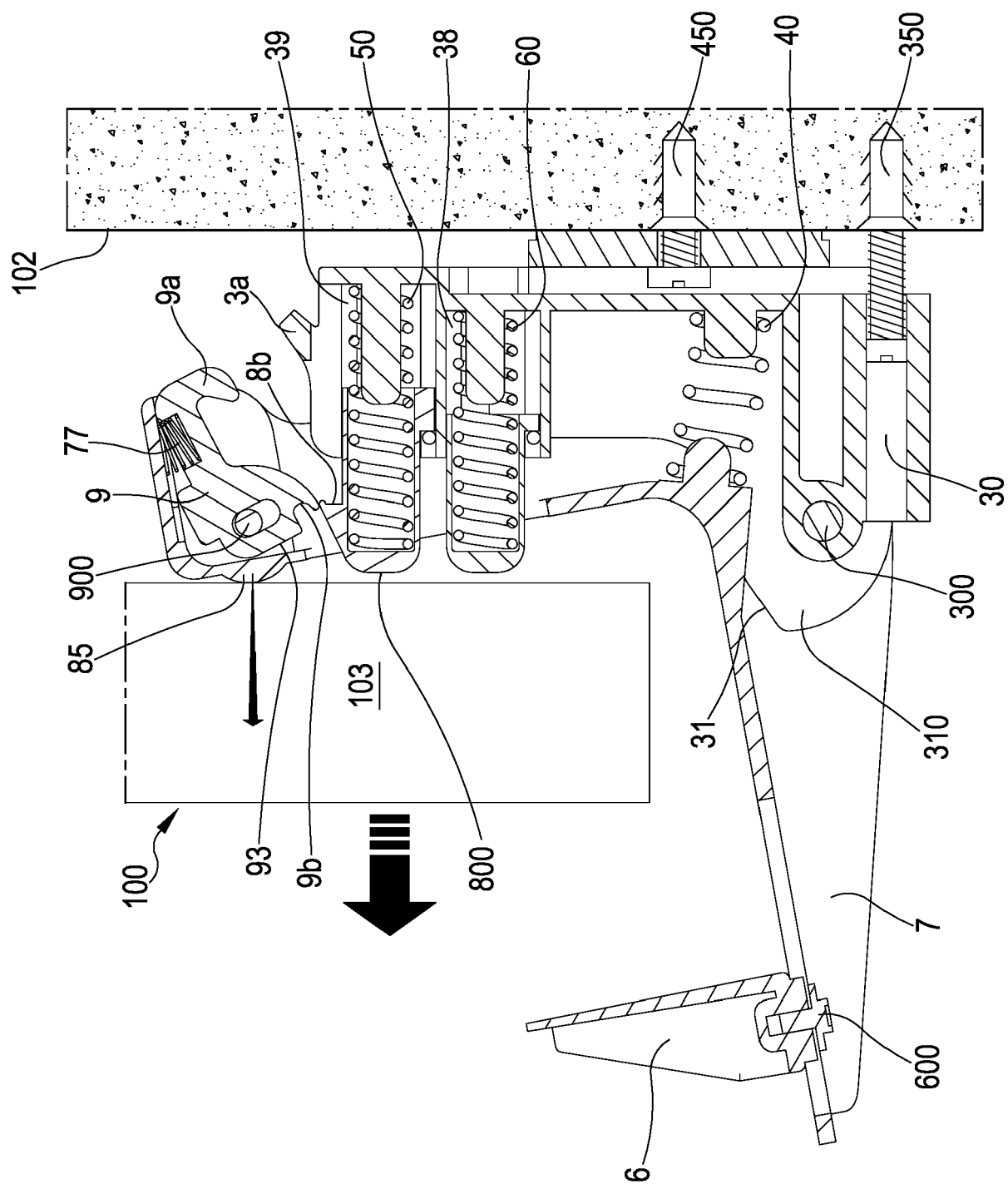


FIG.5

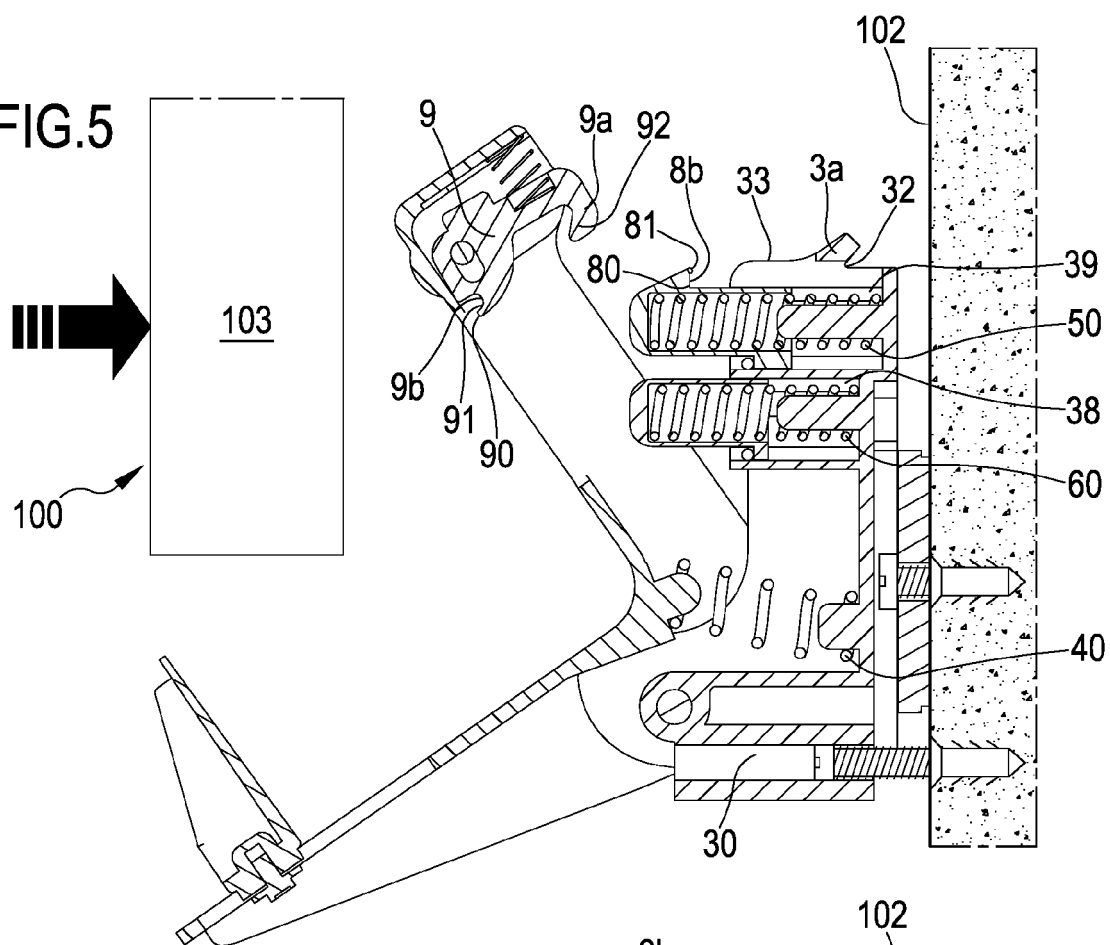


FIG.6

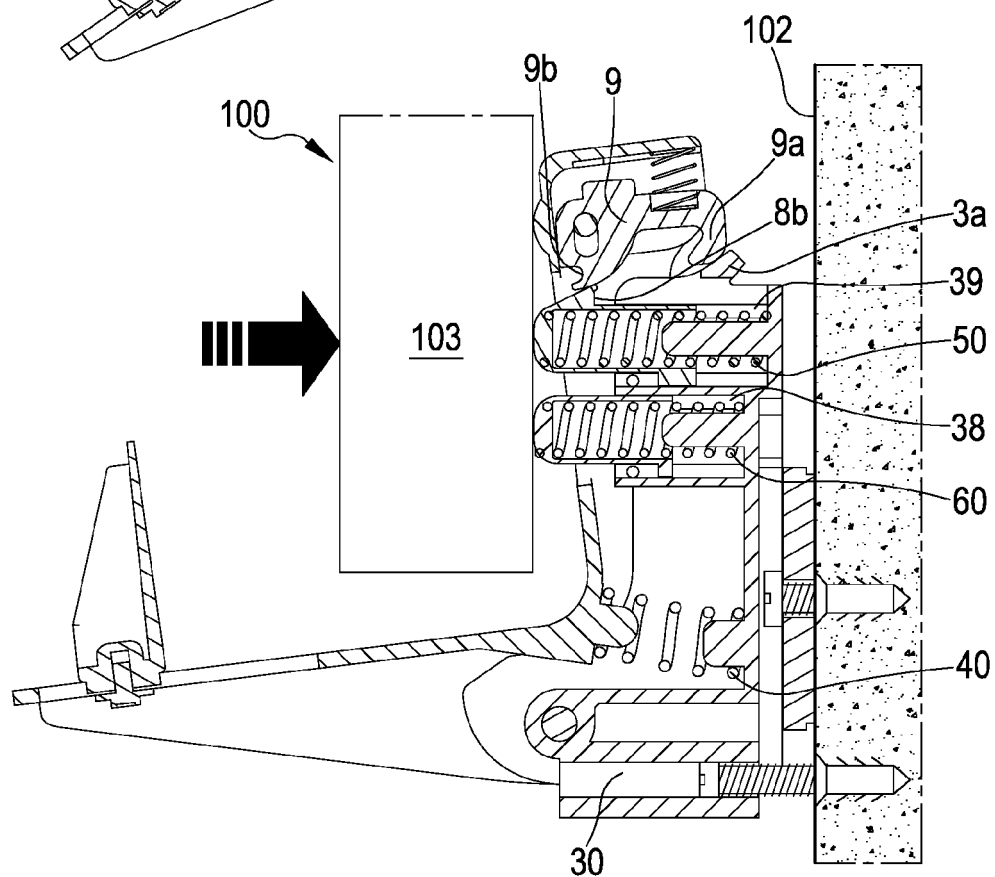
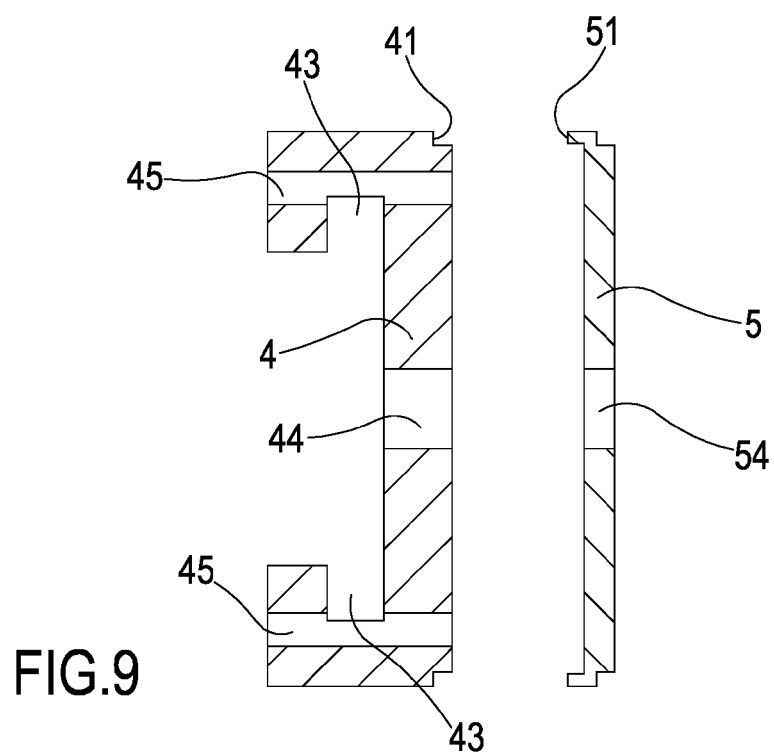
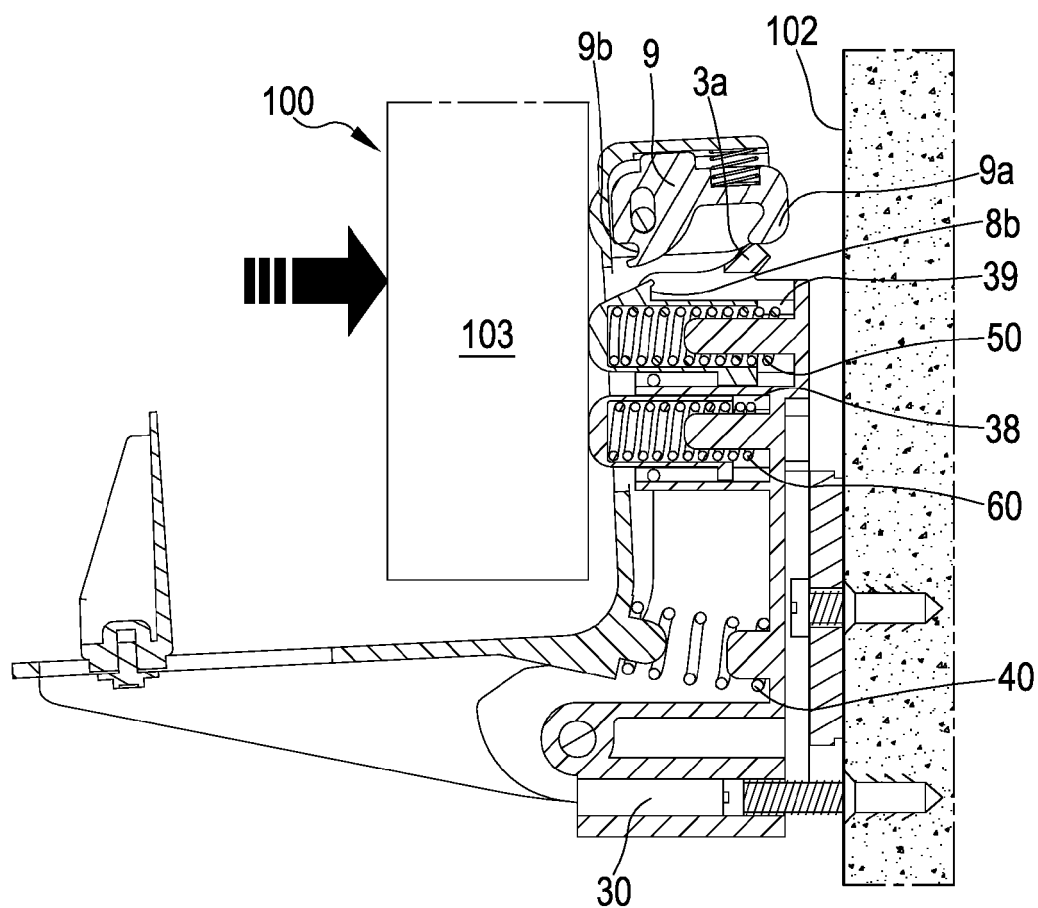


FIG.7



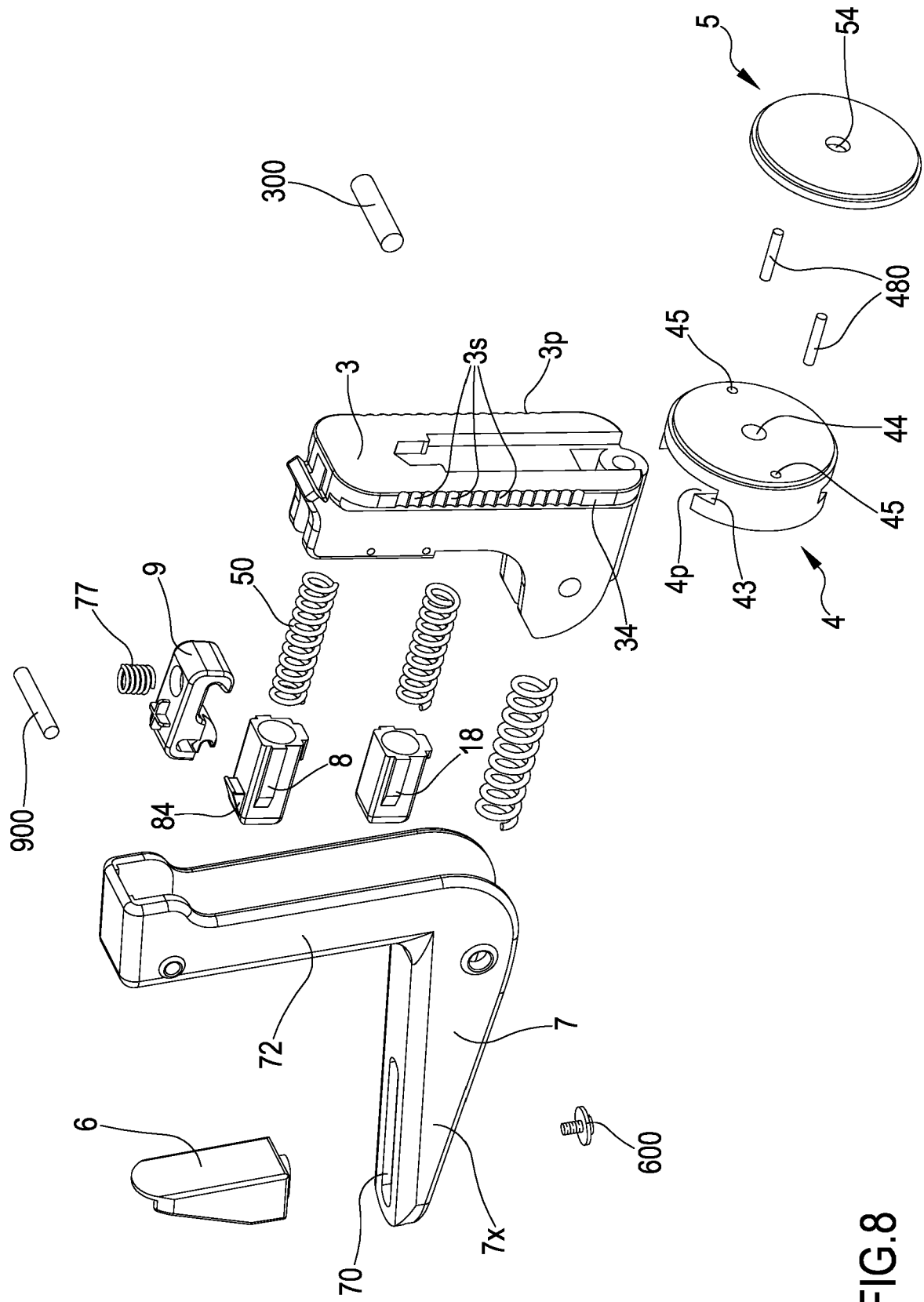
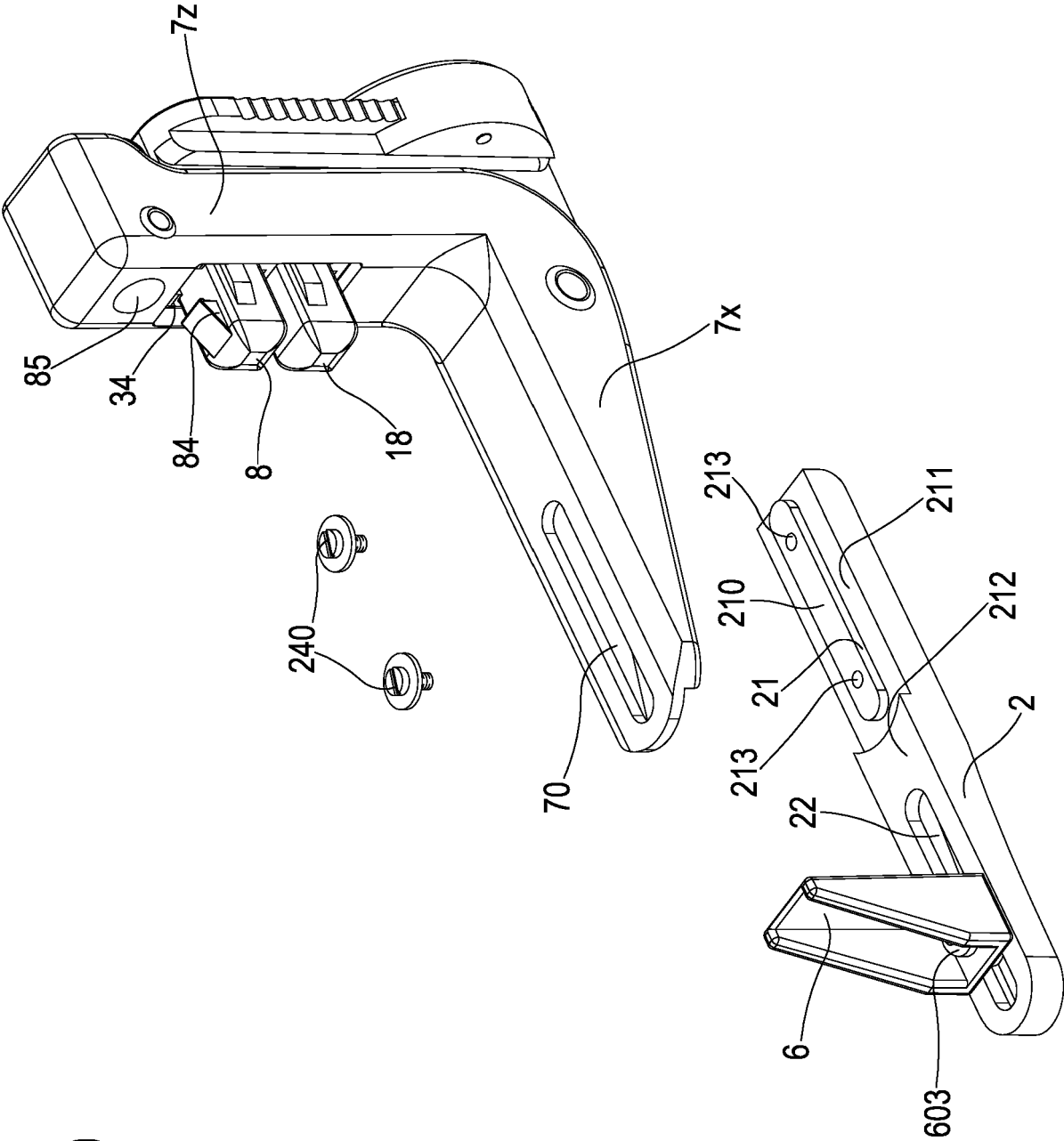


FIG.8





EUROPEAN SEARCH REPORT

Application Number
EP 17 18 1464

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			TECHNICAL FIELDS SEARCHED (IPC)
			E05C E05B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 1 December 2017	Examiner Robelin, Fabrice
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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01-12-2017

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