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(72) Inventor: **Lambertini, Marco**
40068 San Lazzaro di Savena, Bologna (IT)

(74) Representative: **Lanzoni, Luciano**
c/o BUGNION S.p.A.
Via Goito, 18
40126 Bologna (IT)

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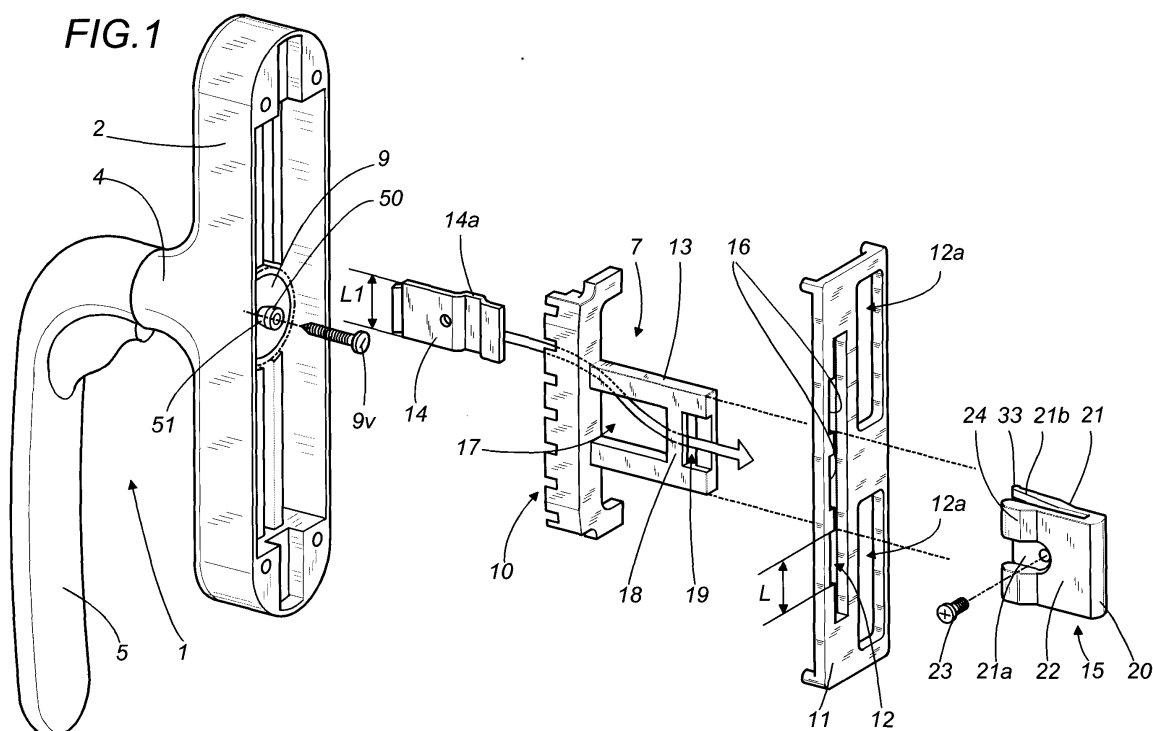
(71) Applicant: **GIESSE S.p.A.**
I-40054 Budrio (Bologna) (IT)

(54) A cremone bolt handle for doors and windows

(57) A cremone bolt handle envisages control parts (7) consisting of an actuator bar (13) projecting from an opening (12) in a base element (11) and attached to a corresponding rack defining an element (10) for supporting, connecting and driving the bar. The bar (13) has a pawl (14), attached at one end and rocking, thanks to means (15), in a direction perpendicular with the plane of the bar (13) in such a way as to assume a locking

position following a connection inside a seat (16) in the base element (11) and when the door or window is in an open configuration, that is to say, with a first part (3) of the door or window distanced from the second part (8) and, respectively, a bar (13) release position, when the door or window is in a closed configuration, that is to say, with the first part (3) moved towards the second part (8).

FIG.1



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Description

[0001] The present invention relates to a multi-purpose cremone bolt handle for doors and windows, in particular metal doors and windows.

[0002] Known cremone bolt handles comprise a handle body (normally quadrangular or with rounded corners), from which there extend, on one side the operating grip and, on the other side the parts designed to operate the door or window closing device.

[0003] This basic structure gave rise to a series of models of cremone bolt handles (for example, patent EP - 446.566, Utility model IT - 227.820 and the application for a patent for a utility model BO94U000059, all by the Applicant) with the aim of diversifying the uses of the cremone bolt handle according to the door or window requirements: multi-purpose or bilateral handle (turning to the right, turning to the left), handle with lockable grip, handle for tilting windows, etc.

[0004] However, the huge commercial expansion of these handles necessitated further embodiments, including a cremone bolt handle for tilt and turn operation (with incorrect movement safety device), with the possibility of left-turning and right-turning use, as well as for outward-opening doors and windows, where it is essential that the external dimensions of the handle are limited, but where the bolt must retain a high level of efficiency and reliability even for the other functions mentioned above.

[0005] Such characteristics are not easily obtained, since the size of the control parts for opening and closing, both with a turning action and a tilting action, and the relative travels necessary to obtain such configurations are not, at present, possible with the handle external dimensions required for outward-opening doors and windows.

[0006] However, the Applicant has created a cremone bolt handle with all of the above-mentioned characteristics, that is to say a handle which is extremely compact, with reduced external dimensions, and which can be used on outward-opening doors and windows, and, if necessary, can perform all of the movements required for opening with a turning action, with a tilting action, etc.

[0007] The technical features of the present invention, in accordance with the above aims, are apparent in the claims herein, and the advantages are more clearly described in the detailed description below, with reference to the accompanying drawings, which illustrate an embodiment of the invention, without limiting the scope of its application, and in which:

Figure 1 is an exploded perspective view of a cremone bolt handle made in accordance with the present invention;

Figure 1A is a perspective view rotated through 180° relative to that in Figure 1, of an accessory illustrated in Figure 1;

Figure 1B is a perspective view rotated through

180° relative to that in Figure 1, of another accessory illustrated in Figure 1;

Figures 2 and 3 are schematic top plan views with some parts cut away and other parts in cross-section to better illustrate others, of the handle illustrated in Figure 1 in two different operating configurations, respectively, handle release and handle locking;

Figures 4 and 5 are schematic side views with some parts cut away to better illustrate others, of the handle in the previous figures, equipped with parts for locking with a key;

Figures 6 and 7 are, respectively, a top plan view of a scaled up detail of a rack illustrated in Figure 1, and a partial perspective view of the same rack;

Figure 8 is a scaled down front perspective view of the handle disclosed;

Figure 9 is a top plan view with some parts cut away and other parts in cross-section, of the handle illustrated in the previous figures, applied to an outward-opening door or window;

Figure 10 is a top plan view with some parts in cross-section and others cut away, of an alternative embodiment of a construction detail of the handle illustrated in the previous figures;

Figure 11 is a top plan view of a detail illustrated in Figure 10, that is to say, an actuator bar;

Figures 12, 13 and 14 are, respectively, a bottom plan view, a side view and a top plan view of another detail of the embodiment in Figure 10, that is to say, a handle locking - release bar.

[0008] With reference to the accompanying drawings, and in particular Figures 1 and 9, the cremone bolt handle disclosed is used on metal doors and windows, such as French windows and windows, the latter in particular having a closing configuration, a turning opening configuration and a tilting opening configuration, with outward opening from the room in which they are fitted.

[0009] This handle, indicated as a whole with the numeral 1, comprises a handle body 2 attached to a first part 3, or wing, of the door or window and from which there extend, on one side with a bushing 4 made so that it forms a single body with the handle body 2, a grip 5 designed to turn a shaft 6 housed inside the handle body 2, through several stable operating positions, set at right-angles to one another. From the other side of the handle body 2 there extend control parts 7 connected to a device for closing the door or window (of the known type and, therefore, not illustrated) with a closing configuration in which the first part 3 makes contact with a second part 8 of the door or window (illustrated only with a dashed line in Figure 2 and more clearly visible in Figure 9; the second part 8 may be the fixed frame or the other wing of a window).

[0010] The handle body 2 also houses a pinion 9 integral with the shaft 6 and connected to an element 10 which supports, connects and drives the control parts 7

in such a way as to allow the control parts to move to several positions corresponding with the above-mentioned operating conditions of the grip 5, respectively corresponding with closing, turning opening, even outwards, and tilting opening of the door or window.

[0011] The handle body 2 has a base element 11, which has a guide opening 12 from which there project the control parts 7 and which is normally a cover that can be attached to the handle body.

[0012] The above-mentioned control parts 7 consist of an actuator bar 13, projecting from the opening 12 in the base cover 11 and normally attached in such a way that it is integral with a corresponding rack defining the above-mentioned element 10 for supporting, connecting and driving the bar.

[0013] The bar 13 has a pawl 14, fixed at one end and rocking, thanks to means 15, in a direction perpendicular to the plane of the bar 13 in such a way that it assumes a locking position, following a connection inside a relative seat 16 in the base element 11, when the door or window is in the open configuration, that is to say, with the first part 3 distanced from the second part 8 of the door or window (see Figure 3), and, respectively a bar 13 release position, when the door or window is in the closed configuration, that is to say, with the first part 3 close to the second part 8 (see Figures 2 and 9).

[0014] As illustrated again in Figure 1, the base element 11, as already indicated, consists of a cover which can be fixed to the handle body 2, by snapping into place or using screws, and has a guide opening 12 with three seats 16 composed of relative lateral openings, one after another and corresponding with the above-mentioned three operating positions which can be assumed by the grip 5. Each seat 16 has a width L greater than the width L1 of the pawl 14.

[0015] The cover 11 also has a pair of second independent openings 12a if the handle is designed for use on interior doors and windows with a tilt and turn action which envisage the known pair of bars with relative racks (of the known type and, therefore, not illustrated).

[0016] The pawl 14 consists of a plate engaged in a matching slot 17 made in the bar 13 in such a way that it defines part of the latter.

[0017] Close to the free end of the bar 13, the slot 17 has a crosspiece 18 which is partially surrounded by a "C"-shaped portion 14a of the plate 14, defining a pivoting point for plate rocking. In addition, the bar 13 has a retaining notch 19 for the end section of the plate 14 located between the crosspiece 18 and the end section of the bar 13.

[0018] Figures 10 to 14 illustrate another embodiment of the pair of elements consisting of the bar 13 and the plate 14.

[0019] In particular, this embodiment tends to improve the efficiency of the plate 14 as it moves from the lowered position (also visible in Figure 10) to the raised position (see Figure 3).

[0020] The pawl 14 (clearly visible in Figures 12 to 14)

consists of a plate which yields elastically and pivots, with its portion 14b, at the free end 13a of the bar 13 to define the central part, open at the centre. The portion 14b of the plate 14 has a "C"-shaped cross-section, so that it completely surrounds the free end 13a of the bar 13.

[0021] Moreover, the plate 14 has a slot 14c in the portion 14b (that is to say, extending substantially in a "C"-shape), one side of which makes contact with a corresponding retaining projection 13b, close to the free end 13a of the bar 13. This connection (clearly visible in Figure 10) allows the definition of a mobile pivoting zone (see arrow F14c) for the plate 14, designed to allow rotation - translation of the plate when the door or window is in the open and, respectively, closed configurations.

[0022] In other words, the plate 14 is not simply housed in the bar 13 in a matching fashion and subject to the action of the drive means 15, but is itself an active element in the drive system: the elasticity of the plate 14, together with the connection and pivoting zone at the end of the bar 13, allow the plate to move safely from the handle 1 release position (door or window closed position), to the handle 1 locking position (door or window open position, see also arrow F8), an operation which is described in more detail below, after the description of the drive means 15.

[0023] As is also illustrated in Figures 2 and 3, the above-mentioned pawl 14 drive - rocking means 15 consist of a leaf spring element 20, which yields elastically.

[0024] More precisely, the leaf spring element 20 has the shape of an inverted "U", designed to define a pair of arms 21 and 22. The first arm 21 can be attached to the pawl 14, using relative screw means 23, whilst the other arm 22, projecting relative to the bar 13, is designed to intercept the second part 8 of the door or window (see Figure 2) so as to allow, through elastic deformation of both arms 21 and 22 (see arrow F), the passage of the pawl 14 from the locking position to the release position.

[0025] As illustrated in Figure 1, the first arm 21 consists of a central portion 21a, directly connected to the pawl 14, and the same size as the pawl. There are two lateral tabs 21b and 21c, one on either side of the central portion 21a, said tabs defined by corresponding notches made in the first arm 21, designed to adhere to the bar 13 and, together with the elastic return of the entire leaf spring 20, allow the passage from the release position to the locking position (see Figure 3), when the two parts 3 and 8 of the door or window are moved away from one another (see arrow F8). The ends of the two tabs 21b and 21c have projections 33 designed to make contact with the bar 13.

[0026] The above-mentioned second arm 22 also has an end projection 24, the surface of which is rounded in such a way as to allow its contact with the second part 8 of the door or window and the recovery of any play between the two parts of the door or window and in the

handle 1 closing mechanisms.

[0027] In the embodiment illustrated in Figures 10 to 14, as already indicated, the passage from the handle 1 release position to the locking position is effected with the combined action of the leaf spring element 20 and the pawl 14 which, thanks to the fact that it pivots at the end of the bar 13, tends to rise to said position autonomously.

[0028] The details in Figures 6 and 7 illustrate the particular structure and shape of the teeth 10d of the rack 10, which are independent of one another and offset from the base of the rack. Said teeth 10d, together with the pinion 9, allow the bar 13 to move in both directions. This particular profile of the teeth 10d allows a movement of the bar 13 which exceeds the actual travel generated by the meshing of the teeth of the pinion 9 and those of the rack 10, since the meshing of each pair of teeth is preceded by an additional thrust in the direction of feed (cam-style), on the rack 10 given by the previous meshing. This factor means that the size of the elements can be restricted, but at the same time allows a bar 13 travel identical to that traditionally used on bigger cremone bolt handle models, allowing both turning and tilting opening.

[0029] As can be seen in Figures 1 to 3, between the toothed pinion 9 and screw means 9v which attach the pinion to the rotating shaft 6, there may be a bushing 50 which has a hollow 51 designed, if the pair of bars are used as control parts, to hold the bars, in a preset position, inside the handle 1 during the assembly stage, that is to say, when the cover 11 has still not been fitted.

[0030] Another addition to the construction of the handle 1 is illustrated in Figure 8, which shows the handle 1 disclosed with a pair of plugs T designed to cover through-seats which house the means for attaching the handle 1 to the door or window.

[0031] Figures 4 and 5 illustrate a model of the handle 1 with parts 25 for locking the grip 5 with a key C.

[0032] These key-operated locking parts 25 consist of a key-locking cylinder 26 housed in the grip 5 and having, on one side, a seat 26a in which the key C engages, and on the other, locking means 27 which prevent rotation of the grip 5, acting between the grip and the bushing 4.

[0033] These means 27 are positioned parallel with and close to an axis of rotation X of the grip coinciding with the above-mentioned rotating shaft 6.

[0034] More specifically, the locking means 27 consist of a face cam 28 with a concave profile, caused to rotate directly by the key C.

[0035] The face cam 28 acts upon a pin 29 which has a head 30 for contact with the cam and is housed in a through-seat 5a in the grip 5. In this way, the pin 29 can be made to slide between a non-operating position (see Figure 4), in which the pin 29 is drawn back inside the grip 5, and an operating position (see Figure 5), in which the pin 29 is partially outside the grip 5 and engages in a seat 31 in the bushing 4, preventing rotation of the grip

5.

[0036] The pin 29 has spring means 32, fitted over it and held, at their ends, by the seat 5a in the grip 5 and by the contact head 30, which cause the pin 29 to return from the operating position to the non-operating position when the key C is turned (see arrow F32).

[0037] A handle thus structured, therefore, fulfils the aims thanks to a structure which provides extremely reliable operation, is more compact but very flexible in terms of use, that is to say, with all of the technical and operating characteristics of conventional cremone bolt handles currently on the market and with further possibilities for use on outward-opening doors and windows without requiring changes to the handle body.

[0038] The reduction in size was achieved thanks to the particular construction of the rack, the structure of the control parts (bar - pawl - leaf spring) which, in a limited space, allow all drive movements required for the wing open or closed configurations, avoiding the known problem of incorrect movements with the wing open. This, as indicated, is all provided by a cremone bolt handle made compact so that the handle can be used on outward-opening doors and windows.

[0039] The key locking system is also made using very small control parts, to avoid unattractive effects (thanks to the closeness of the locking system to the axis of rotation of the grip), but maintains a high level of efficient and reliable closing.

[0040] In practice, a complete cremone bolt handle is provided which, with a kit consisting of a limited number of accessories, can be mounted on any type of door or window by selecting the appropriate accessories and without working on the handle body, assembly of the accessories being extremely simple. The invention described can be subject to modifications and variations without thereby departing from the scope of the inventive concept. Moreover, all the details of the invention may be substituted by technically equivalent elements.

Claims

1. A cremone bolt handle for doors and windows, the handle (1) being of the type which comprises a handle body (2) attached to a first part (3) or wing of the door or window, from which handle body there projects, on a side having a bushing (4) made so that it forms a single body with the handle body (2), a grip (5), being designed to provoke the rotation of a shaft (6) housed inside the handle body (2), between several stable, operating positions, separated by at least a right angle; and there projecting from the other side of the handle body (2) control elements (7) connected to a device for closing the door or window in a closed configuration in which the first part (3) of the door or window is in contact with a second part (8) of the door or window; the handle body (2) also housing a pinion (9) integral

with the shaft (6) and having an element (10) for supporting, connecting and driving the control parts (7) in such a way as to allow said parts to move between several positions corresponding with the grip (5) operating positions and respectively corresponding with at least one position in which the wing is closed, one in which the door or window is opened with a turning action and one in which it is opened with a tilting action; the handle body (2) also having a base element (11) for the handle body which has a guide opening (12) from which the control parts (7) project, the cremone bolt handle being characterised in that it has control parts (7) consisting of an actuator bar (13) projecting from the opening (12) in the base element (11) and attached to a rack defining the element (10) for supporting, connecting and driving the bar; the bar (13) having a pawl (14) attached at one end and rocking, thanks to means (15), in a direction perpendicular with the plane of the bar (13), thus assuming a locking position following a connection in a relative seat (16) in the base element (11) and when the door or window is in the open configuration, that is to say, with the first part (3) distanced from the second part (8) of the door or window and, respectively, a bar (13) release position when the door or window is in the closed configuration, that is to say, with the first part (3) moved towards the second part (8).

2. The handle according to claim 1, characterised in that the base element (11) consists of a cover which can be fixed to the handle body (2), having a guide opening (12) with three seats (16) consisting of relative lateral openings, one after another and corresponding with the three grip (5) operating positions, each lateral opening having a width (L) greater than the width (L1) of the pawl (14).

3. The handle according to claim 1, characterised in that the pawl (14) consists of a plate engaged inside a matching slot (17) in the bar (13) of which it is a part; the slot (17) having, close to the free end of the bar (13), a crosspiece (18) partially surrounded by a "C"-shaped portion (14a) of the plate (14), thus defining a pivoting point for plate rocking; the bar (13) also having a retaining notch (19) for the end section of the plate (14), said notch being located between the crosspiece (18) and the end section of the bar (13).

4. The handle according to claim 1, characterised in that the pawl (14) consists of a plate which yields elastically and pivots with its portion (14c) at the free end (13a) of the bar (13), defining the central part of the bar, which is open at the centre; the plate (14) having said section (14b) with a "C"-shaped cross-section so as to surround the free end (13a) of the bar (13); the plate (14) also having a slot (14c) in

the portion (14c) and making contact with a corresponding retaining projection (13b), located on the free end (13a) of the bar (13), defining a plate (14) pivoting zone which is mobile close to the projection (13b), being designed to allow rotation - translation of the plate when the door or window is in the open and, respectively, closed configurations.

5. The handle according to claim 1, characterised in that the drive means (15) for the pawl (14) consist of an elastically yielding leaf spring element (20).

6. The handle according to claims 1 and 4, characterised in that the leaf spring element (20) has the shape of an inverted "U", being designed to define a pair of arms (21, 22), it being possible to attach the first arm (21) to the pawl (14), using screw means (23), and the other arm (22) projecting relative to the bar (13), being designed to intercept the second part (8) of the door or window, allowing, through the elastic deformation of the arms (21, 22), the passage of the pawl (14) from the locking position to the release position.

7. The handle according to claim 6, characterised in that the first arm (21) consists of a central portion (21a), attached to the pawl (14) and the same size as the pawl and two lateral tabs (21b, 21c), defined by corresponding notches in the first arm (21), being designed to adhere to the bar (13) and, together with the elastic deformation of the leaf spring (20), to allow the passage of the door or window from the release position to the locking position, when the two parts (3, 8) of the door or window are moved away from one another; the ends of the tabs (21b, 21c) having corresponding projections (33) which make contact with the bar (13).

8. The handle according to claim 6, characterised in that the second arm (22) has an end projection (24) with a surface rounded in such a way as to allow contact with the second part (8) of the door or window and the recovery of play between the two parts of the door or window.

9. The handle according to claim 1, in which the handle (1) is fitted with parts (25) for locking the grip (5) with a key (C), characterised in that the key locking parts (25) consist of a key-locking cylinder (26) housed in the grip (5) and having, on one side, a seat (26a) in which the key (C) engages, and on the other, locking means (27) which prevent rotation of the grip (5), acting between the grip and the bushing (4) and being parallel with and close to an axis of rotation (X) of the grip coinciding with the above-mentioned rotating shaft (6).

10. A cremone bolt handle for doors and windows, the

handle (1) being of the type which comprises a handle body (2) attached to a first part (3) or wing of the door or window, from which handle body there projects, on a side having a bushing (4) made so that it forms a single body with the handle body (2), a grip (5), being designed to provoke the rotation of a shaft (6) housed inside the handle body (2), between several stable, operating positions, separated by at least a right angle; and there projecting from the other side of the handle body (2) control elements (7) connected to a device for closing the door or window in a closed configuration in which the first part (3) of the door or window is in contact with a second part (8) of the door or window; the handle body (2) also housing a pinion (9) integral with the shaft (6) and having an element (10) for supporting, connecting and driving the control parts (7) in such a way as to allow said parts to move between several positions corresponding with the grip (5) operating positions and respectively corresponding with at least one position in which the wing is closed, one in which the door or window is opened with a turning action and one in which it is opened with a tilting action; the handle body (2) also having a base element (11) for the handle body which has a guide opening (12) from which the control parts (7) project, the cremone bolt handle being characterised in that it has parts (25) for locking the grip (5) with a key (C), consisting of a key-locking cylinder (26) housed in the grip (5) and having, on one side, a seat (26a) in which the key (C) engages, and on the other, locking means (27) which prevent rotation of the grip (5), acting between the grip and the bushing (4) and being parallel with and close to an axis of rotation (X) of the grip coinciding with the above-mentioned rotating shaft (6).

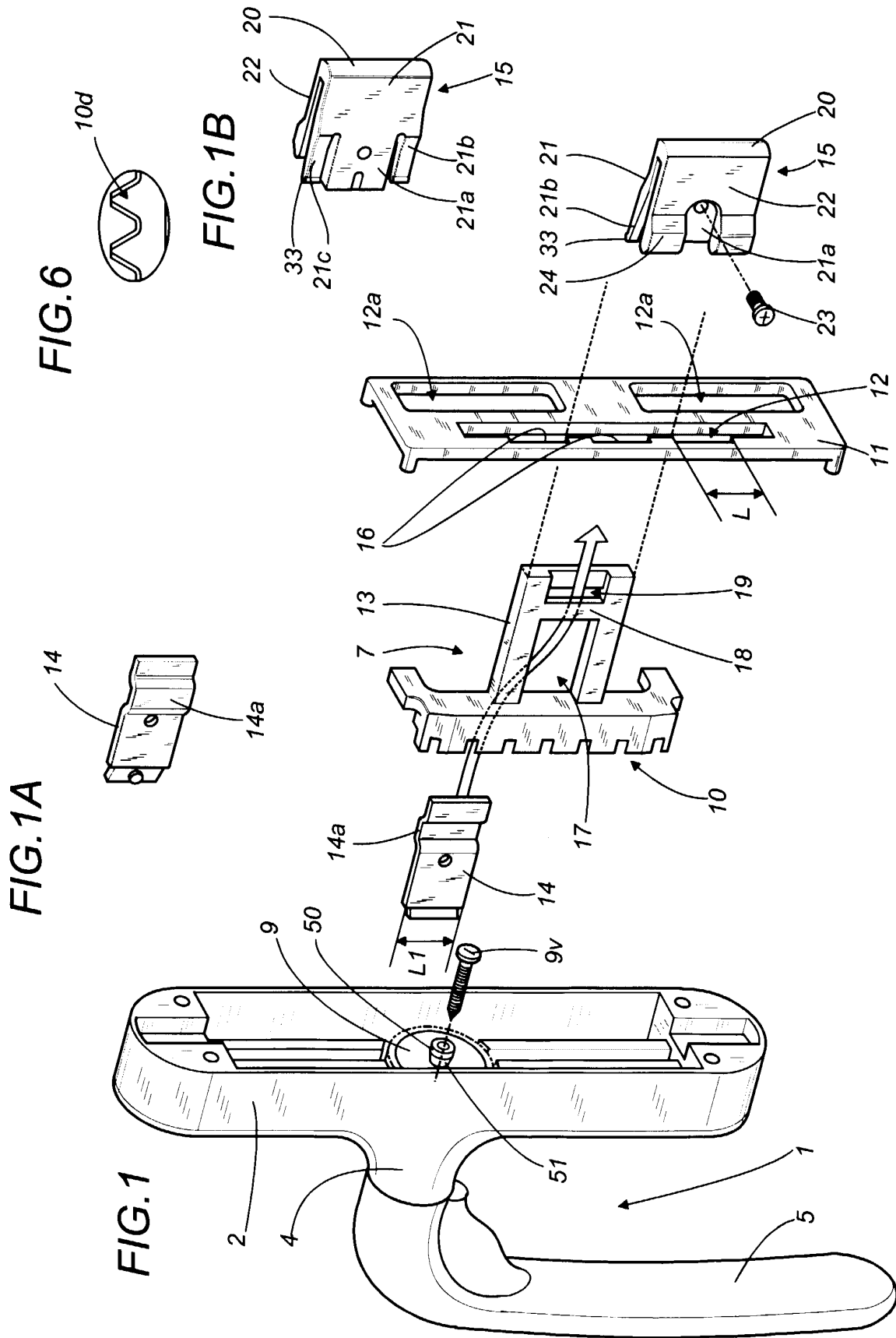
11. The handle according to claim 9 or 10, characterised in that the locking means (27) consist of a face cam (28) with a concave profile, the latter being rotated directly by the key (C); said face cam (28) acting upon a pin (29) which has a head (30) for contact with the cam and is housed in a through-seat (5a) in the grip 5, causing the pin (29) to slide between a non-operating position, in which the pin (29) is drawn back inside the grip (5), and an operating position, in which the pin (29) is partially outside the grip (5) and engages in a seat (31) in the bushing (4), preventing rotation of the grip (5).

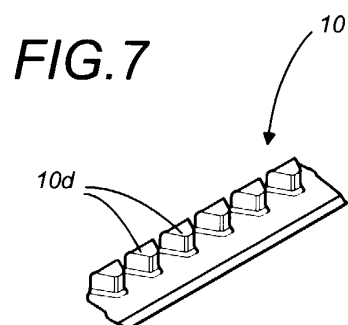
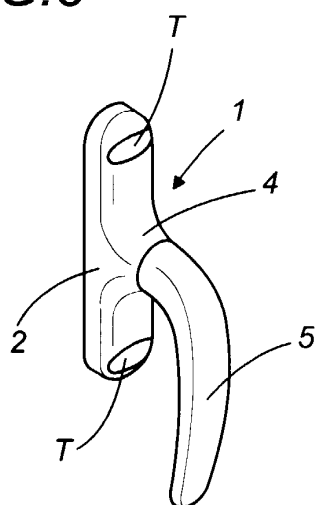
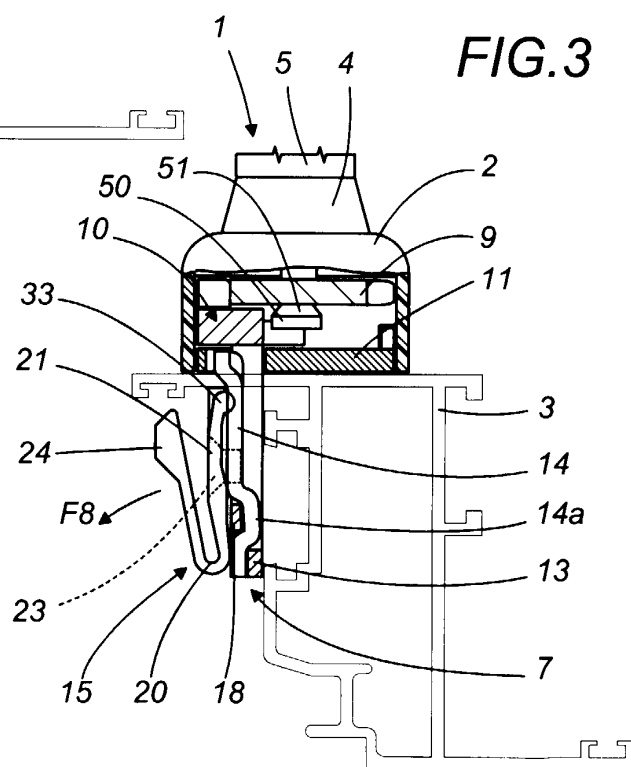
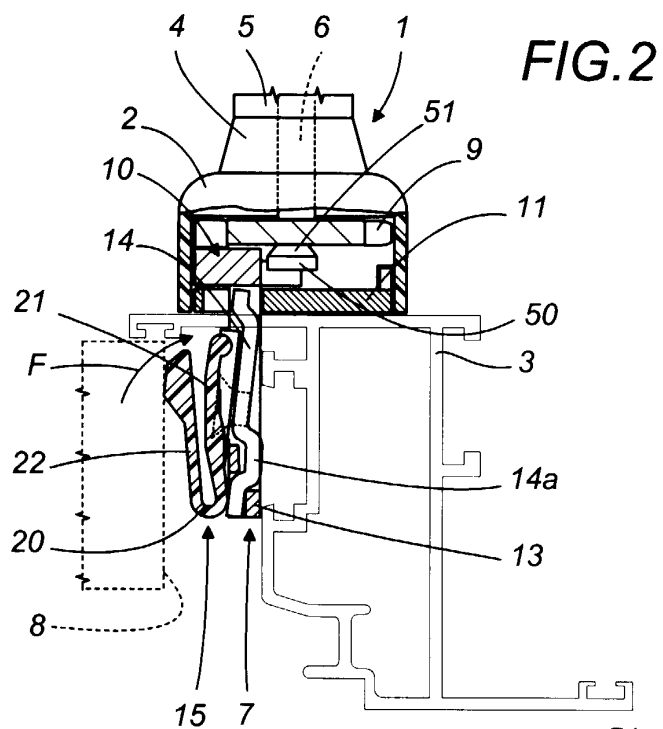
12. The handle according to claim 11, characterised in that the pin (29) is fitted with spring means (32), being held, at their ends, by the seat (5a) in the grip (5) and by the contact head, being designed to allow the pin (29) to return from the operating position to the non-operating position.

13. The handle according to claim 1, characterised in

that the rack (10) has a plurality of teeth (10d), projecting from the base of the rack (10), that is to say, made along one edge only and each having a profile with rounded corners, thus allowing an additional cam-style forward movement to be transmitted between the rack (10) and the toothed pinion (9).

14. The handle according to claim 1, characterised in that between the toothed pinion (9) and screw means (9v) designed to attach the pinion to the rotating shaft (6), there is a bushing (50), having a hollow (51) opposite the pinion (9) and designed to hold the elements (10) for supporting, connecting and driving the control parts (7) inside the handle body (2) when the handle (1) is assembled.





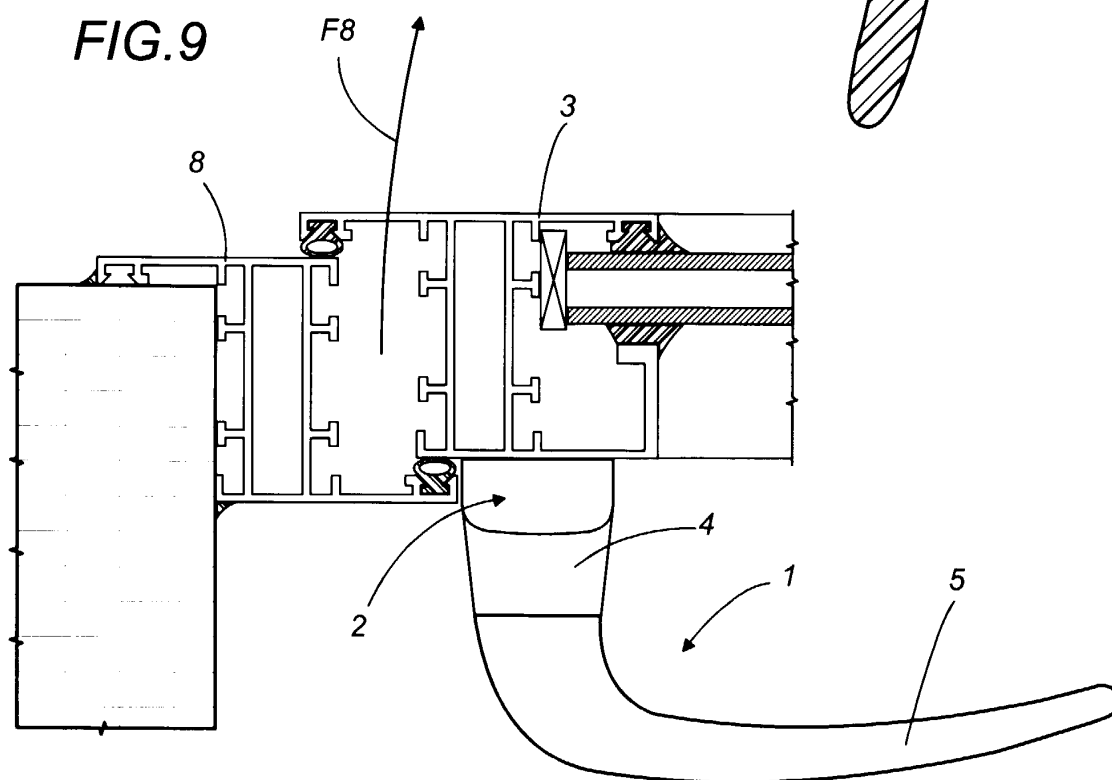
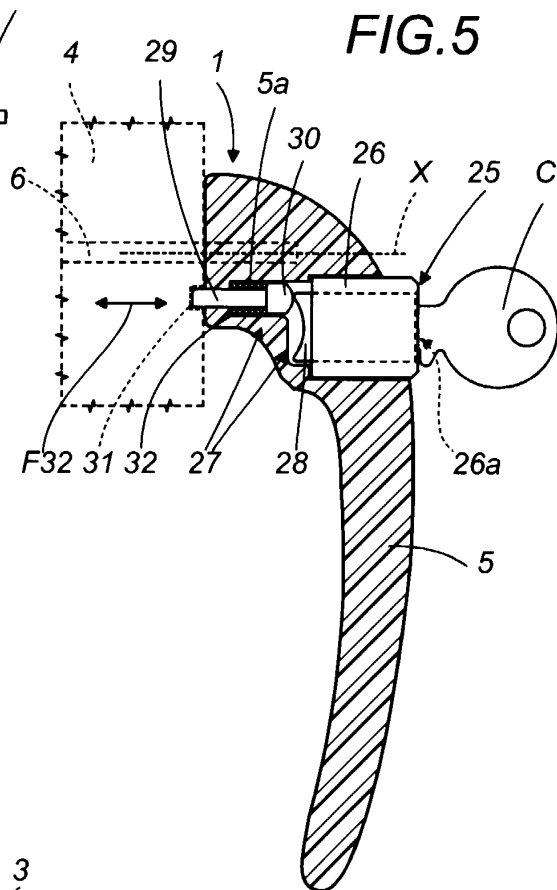
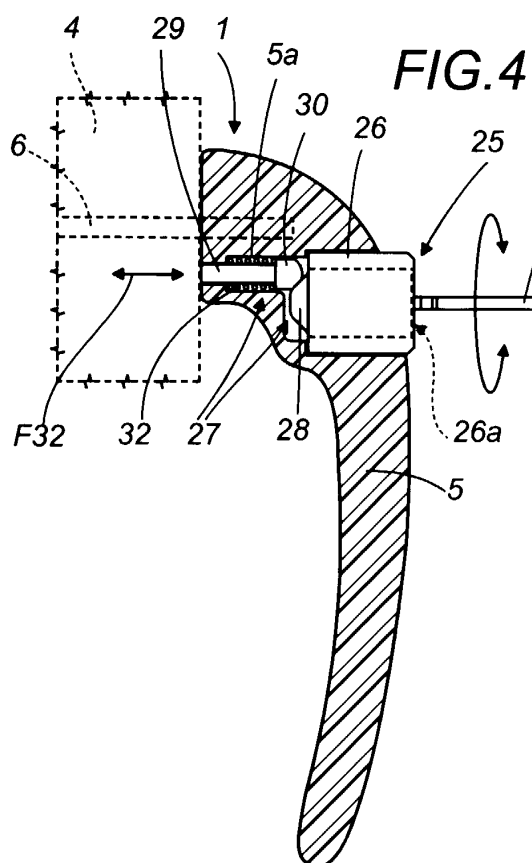


FIG. 10

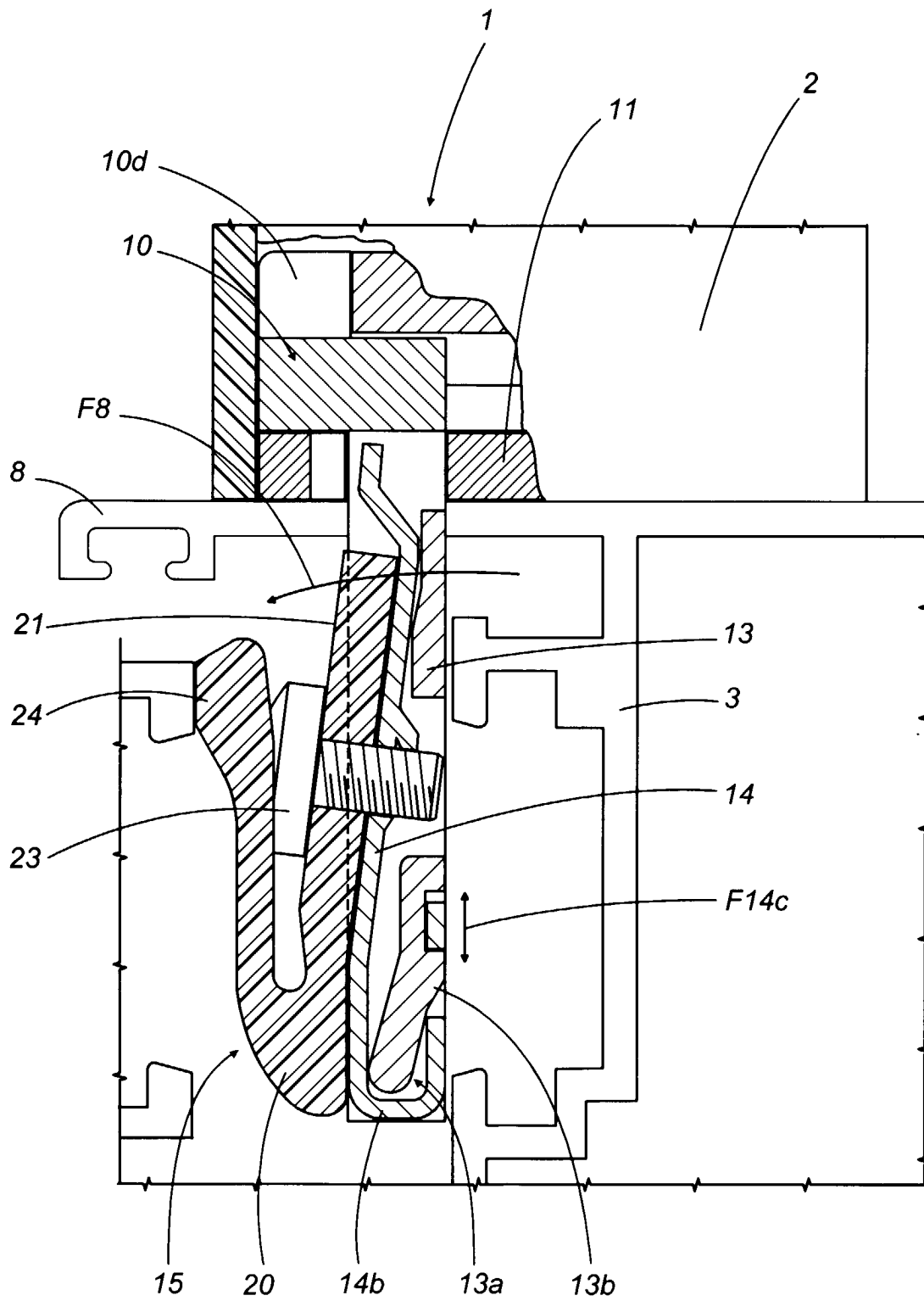


FIG.11

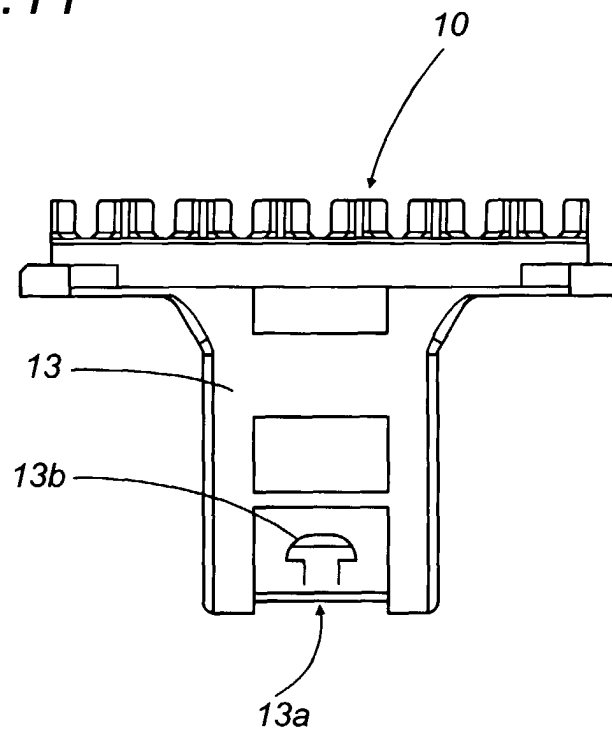


FIG.12

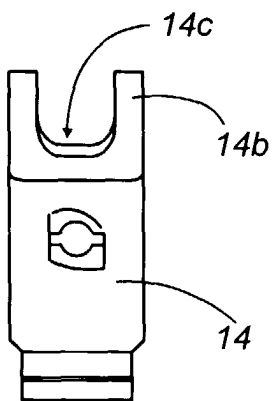


FIG.13

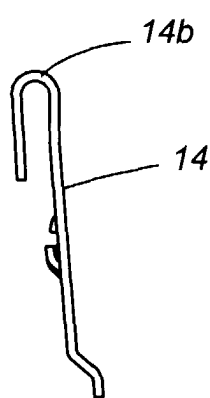


FIG.14

