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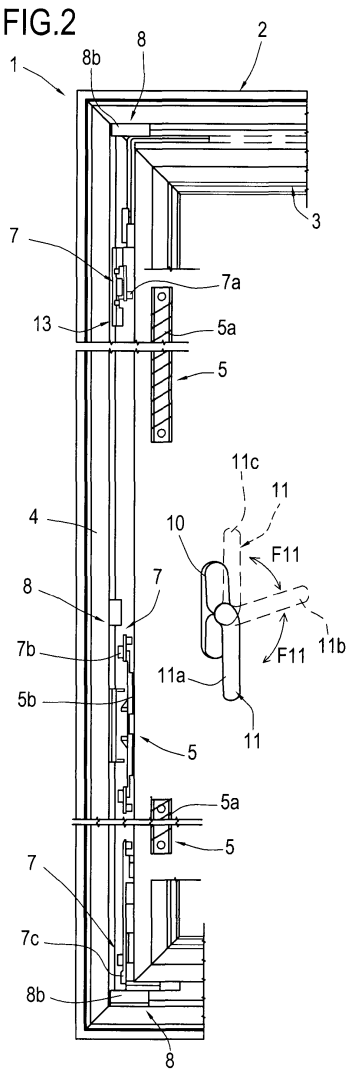
(54) Side-hung frame for doors and windows

(57) A door or window frame (1) comprises: a fixed frame (2) and a sash (3) hinged to one another along a stile (4); transmission means (5) designed to allow the movement of contact and/or closing elements (7), to define, in conjunction with fixed connecting elements (8) positioned on the fixed frame (2), closed and turned open configurations; a handle (10) acting on the transmission means (5) to determine, through rotation of its handgrip (11), the closed and turned open configurations, corresponding to at least two stable positions of the handgrip (11); an auxiliary connecting element (13), associated with the fixed frame (2) and acting on a closing element (7a) when the handgrip (11) moves into a third stable operating position allowing guided interception of the closing element (7a) by the auxiliary element (13) in such a way as to space the sash (3) from the fixed frame (2) to a limited extent in order to at least partly break the seal of the frame (1).

FIG.2



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Description

[0001] This invention relates to a side-hung frame for doors and windows, in particular a frame made of metal, PVC or the like, aluminium and wood, and so on.

[0002] At present, traditional (that is, side-hung) door and window frames opened by turning basically comprise:

- a fixed frame and a sash hinged to one another, usually along a respective stile; and
- control and operating means positioned on the sash and acting between the sash and the fixed frame to allow the sash to be closed and turned open.

[0003] In the specific case of door or window frames made of metal, PVC or a combination of PVC and wood, in which there is a profile forming a groove for both the fixed frame and the sash, housing operating accessories, these control and operating means, of the known type, may comprise, in the sash, transmission means slidably mounted in the groove (one or more rods connected to one another) and designed to move closing elements (for example bolts and/or contact pins) associated with the sliding transmission element.

[0004] It is also widely known that in order to achieve said closed configuration of the sash on the fixed frame, the closing elements are combined with contact means (plugs or cup-shaped elements) made or associated on / in the fixed frame groove, which engage with the closing element present in the sash groove.

[0005] These contact means are usually positioned close to the lower and upper end zones of the fixed frame and in intermediate zones of the fixed stile (forming a so-called "third closing point") coupled with the movable stile opposite the hinged one.

[0006] A handle is used to operate these control means (in most cases a Cremone bolt handle) as the element for opening and closing the door or window unit. The handle moves by rotating to two stable positions, for turning the door or window open and for closing it.

[0007] Over time, doors and windows of this kind have become more and more reliable, allowing rooms to be securely closed and sealed, thanks to the above-mentioned mechanisms and the customary seals present between the fixed frame and the sash.

[0008] However, such features, in particular the high level sealing provided by the seals, have resulted in the disadvantage of the need for regular ventilation of the rooms where these doors and windows are installed.

[0009] Ventilation, however, can be achieved only by opening the door or window by turning it and this may create unwanted effects, such as: excessive temperature changes in the room (particularly in winter), lack of security for the room as regards the possibility of breaking and entering through the open door or window, thus requiring opening times for ventilation to be minimised if no one is present in the room.

[0010] For this reason the Applicant has designed and produced a frame for doors and windows of the traditional, side-hung type with another configuration designed to allow "micro-ventilation" of the room without affecting the construction architecture or the structure of the door or window frame as a whole and also maintaining a high level of door and window security.

[0011] Accordingly, the invention achieves this aim with a side-hung frame for doors and windows, in particular a door or window frame comprising the technical features described in one or more of the claims herein.

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

- Figure 1 is a schematic front view of a side-hung door and window frame according to the present invention;
- Figure 2 is a front view of part of the door or window frame of Figure 1 and a partly perspective view of accessories mounted on one side of the door or window frame;
- Figures 3 and 4 are top plan views with some parts cut away and others in cross-section of a part of the door or window frame of Figure 2 in two different operating configurations;
- Figures 5 to 7 are respectively a front view, a top plan view and a perspective view of an accessory which can be applied to the door or window frame illustrated in the drawings listed above;
- Figure 8 is a cross-section through line VIII-VIII of Figure 5;
- Figure 9 is a schematic front view, with some parts cut away, of the accessory of Figures 5 to 8 applied to the fixed stile of the door or window frame according to the invention;
- Figures 10 to 12 are schematic side views, with some parts cut away, of the three different positions that can be adopted by a bolt relative to the accessory applied to the fixed stile of the door or window frame of Figure 2.

[0013] With reference to the accompanying drawings, and in particular with reference to Figures 1 to 4, the door or window frame according to the invention, denoted in its entirety by the numeral 1, is of the traditional type that can be opened by turning, known in the jargon of the trade as "side-hung".

[0014] The door or window frame 1 may be made with profiles made of metal, PVC or the like, aluminium and wood, and so on, without limiting the scope of the invention.

[0015] This door or window frame 1 basically compris-

es:

- a fixed frame 2 and a sash 3 hinged to one another along a stile 4;
- transmission means 5, positioned along a first groove 6 of the sash 3 and designed to allow movement of contact and/or closing elements 7 along the first groove 6, so as to define, in conjunction with fixed connecting elements 8 positioned on a second groove 9 of the fixed frame 2, a door or window frame 1 closed configuration 11a and a turned open configuration 11b;
- a control handle 10, positioned on the sash 3, and acting on the transmission means 5 so as to determine, through rotation of its handgrip 11, closed and turned open configurations, corresponding to two stable positions of the handgrip 11 (indicated by the arrows F11 in Figure 2);
- sealing means 12 acting between the fixed frame 2 and the sash 3 and positioned, in the door or window frame 1 closed configuration, in contact with the fixed frame 2 and the sash 3, for sealing the door or window frame 1 when closed.

[0016] Looking in more detail, again see Figure 2, the transmission means 5, of the known type, may be rods 5a and drive elements 5b connected to the handle 10.

[0017] The contact elements 7 may consist of bolts 7b and end contact pins 7c associated with the rods 5a. These elements operate in conjunction with the connecting elements 8 (for example cups 8b for housing the contact pins 7c) to determine the above-mentioned door or window frame 1 configurations.

[0018] In addition, the door or window frame 1 comprises:

- an auxiliary connecting element 13, associated with the fixed frame 2 and acting on a sash 3 closing element 7a when the handgrip 11 moves into a third stable operating position 11c allowing guided interception of the closing element 7a (see path indicated by the arrow F7a in Figure 9) by the auxiliary element 13 in such a way as to space the sash 3 from the fixed frame 2 to a limited extent and thus spacing the sealing means 12 from the fixed frame 2 in order to at least partly break the seal of the frame 1.

[0019] More specifically (see Figure 2), the auxiliary connecting element 13 is associated on the second groove 9 of the fixed stile 4a opposite the hinged stiles 4.

[0020] The closing element 7a is in turn positioned on the corresponding movable stile 3a so that, in the door or window frame 1 closed configuration, it forms an additional closing point in conjunction with a respective fixed connecting element 8.

[0021] In practice, the auxiliary connecting element 13 stably houses the closing element 7a when the handgrip 11 moves into the third stable operating position in such a way as to define a third, ventilation configuration of the door or window frame 1.

[0022] At a constructional level, the closing element 7 comprises a bolt 7a associated with the transmission means 5 (the above mentioned rods 5a) designed to allow it to move along the first groove 6 according to the possible door or window frame 1 configurations.

[0023] The fixed stile 4a is associated with a fixed connecting element 8a operating in conjunction with the bolt 7a when the door or window frame 1 is in the closed configuration.

[0024] As shown in Figures 5 to 9, the auxiliary connecting element 13 comprises a cup-shaped body 15 stably associated with the second groove 9 of the fixed stile 4a.

[0025] The cup-shaped body 15 has shaped walls 15a and 15b forming a connecting path for the bolt 7a, with the handgrip 11 in the above mentioned third operating position in such a way as to enable the sash 3 to move into the additional, ventilation position where its is spaced to a limited extent from the fixed frame 2.

[0026] Looking in more detail, the cup-shaped body 15 is stably positioned close to the fixed connecting element 8a.

[0027] The distance C between the free ends of the cup-shaped body 15 walls 15a and 15b and the fixed connecting element 8a is at least greater than a stroke of the fixed connecting element 8a defining the passage from the closed to the open configuration of the frame 1: thus, the cup-shaped body 15 does not interfere with the open configuration of the frame 1 whereas further rotation of the handgrip 11 causes the bolt 7a to move a little further towards the cup-shaped body 15 to define the ventilation configuration.

[0028] As illustrated in Figures 3 and 4, the sealing means 12 comprise first seals 12a positioned on the sash 3 and second seals 12b positioned on the fixed frame 2 and, therefore in the third stable operating or ventilation configuration of the door or window frame 1, the path for interception of the closing element 8a in the auxiliary connecting element 13 results in moving the first seals 12a away from the fixed frame 2 and moving the sash 3 away from the second seals 12b at least along the movable stile 4a and a partial section of the respective two movable rails 4b and 4c contiguous with the movable stile 4a.

[0029] As illustrated in Figures 5 to 9, the cup-shaped body 15 comprises a lower body 15d stably associated with the second groove 9 and the upper cup defined by the walls 15a and 15b joined to each other at one end to form a closed seat.

[0030] The cup-shaped body 15 has a first section 15c of one wall 15a extending at an angle and converging towards the inside of the cup-shaped body 15 to form a path for guiding the bolt 7a into the cup-shaped body 15 to allow a slight opening movement of the sash 3.

[0031] Looking in more detail, the cup-shaped body 15 is divided into two specular portions, joined to form two closed seats opposite one another, for accommodating

the closing bolt 7a and able to be positioned in the second groove 9 according to the type of door or window frame 1 opening (right- or left-hand).

[0032] The central part of the cup-shaped body 15, where the two seats join, is constituted by the above mentioned fixed connecting element 8a.

[0033] In addition, the cup-shaped body 15 with the connecting element 8a is equipped with stable means 20 (screws) for fixing it to the second groove 9 in such a way as to fasten it securely on the fixed stile 4a.

[0034] In practice, therefore, the traditional side-hung door or window frame 1 has an additional, "micro ventilation" configuration produced by moving the handgrip 11 of the handle 10 to a third position.

[0035] The positions of the handgrip 11 and the corresponding configurations of the bolt 7a are illustrated in Figures 10 to 12:

- in Figure 10, the bolt 7a is against the closing element 8a (position 11a of the handgrip 11);
- in Figure 11, the handgrip 11 has been turned to position 11b causing the drive rod 5a to slide downwards and the bolt 7a to move down to a frame 1 open position (see arrow F11b);
- in Figure 12, the handgrip 11 has been turned to position 11c causing the bolt 7a to move further down into the third, micro ventilation position inside the cup-shaped body 15, (see arrow F11c).

[0036] A door or window frame made in this way achieves the above mentioned aims thanks to an additional configuration that allows limited ventilation of the room where the door or window frame is installed.

[0037] The application of a single additional element combined with an accessory already present allows limited opening of the door or window frame by the user for a minimum change of air, but maintains good anti-breaking and entering features, since the sash is quite close to the fixed frame and is secured at an intermediate closing point.

[0038] The additional position of the handle has the following two important constructional advantages:

- the possibility of using existing handles made for tilt and turn doors and windows (that is, with three positions), thus standardising handle stocks;
- the possibility of using a single part both for the third closing point and for activating a "micro ventilation" configuration allows the technical features and appearance of the door or window frame and its other accessories to remain unchanged.

[0039] It will be understood that the invention described may be useful in many industrial applications and may be modified and adapted in several ways without thereby departing from the scope of the inventive concept. Moreover, all the details of the invention may be substituted by technically equivalent elements.

Claims

1. A side-hung door and window frame (1) of the type comprising at least:

   - a fixed frame (2) and a sash (3) hinged to one another along a stile (4);
   - transmission means (5), positioned along a first groove (6) of the sash (3) and designed to allow movement of contact and/or closing elements (7) along the first groove (6), so as to define, in conjunction with fixed connecting elements (8) positioned on a second groove (9) of the fixed frame (2), door or window frame (1) closed and turned open configurations;
   - a control handle (10), positioned on the sash (3), and acting on the transmission means (5) so as to determine, through rotation of its handgrip (11), said closed and turned open configurations corresponding to at least two stable positions of the handgrip (11); the door or window frame being **characterised in that** it comprises:
   - an auxiliary connecting element (13), associated with the fixed frame (2) and acting on a sash (3) closing element (7a) when the handgrip (11) moves into a third stable operating position allowing guided interception of the closing element (7a) by the auxiliary element (13) in such a way as to space the sash (3) from the fixed frame (2) to a limited extent in order to at least partly break the seal of the frame (1).

2. The door or window frame according to claim 1, including sealing means (12) positioned between the fixed frame and the sash (3), in contact with the fixed frame (2) and the sash in such a way as to seal the door or window frame (1) when it is in the closed configuration, **characterised in that** moving the handgrip (11) into the third stable operating position permits guided interception of the closing element (7a) by the auxiliary element (13) in such a way as to space the sash (3) from the fixed frame (2) to a limited extent in such a way as to move the sealing means (12) apart slightly in order to at least partly break the seal of the frame (1).

3. The door or window frame according to claim 1, **characterised in that** the auxiliary connecting element (13) is associated on the second groove (9) of a fixed stile (4a) opposite the stiles (4) hinged to one another and the closing element (7a) is positioned on the corresponding movable stile (3a) so that, in the door or window frame (1) closed configuration, it forms an additional closing point in conjunction with a fixed connecting element (8).

4. The door or window frame according to claim 1, **characterised in that** the auxiliary connecting ele-

ment (13) stably houses the closing element (7a) when the handgrip (11) moves into the third stable operating position in such a way as to define a third, ventilation configuration of the door or window frame (1).

5. The door or window frame according to claims 1 to 4, where the closing element (7) comprises a bolt (7a) associated with the transmission means (5) designed to allow it to move along the first groove (6) according to the door or window frame (1) configurations, **characterised in that** the auxiliary connecting element (13) comprises an open cup-shaped body (15) stably associated with the second groove (9); the cup-shaped body (15) having walls (15a, 15b) shaped to form a connecting path for the bolt (7a), with the handgrip (11) in the third operating position in such a way as to allow the sash (3) to move into the additional, ventilation configuration where it is slightly spaced from the fixed frame (2).

6. The door or window frame according to claim 5, where the fixed stile (4a) is associated with a fixed connecting element (8a) operating in conjunction with the bolt (7a) in the door or window frame (1) closed configuration, **characterised in that** the cup-shaped body (15) is positioned stably close to the fixed connecting element (8a); the distance (C) between the free ends of the walls (15a, 15b) and the fixed connecting element (8a) being at least greater than a stroke of the fixed connecting element (8a) defined by the passage of the frame (1) from the closed to the open configuration.

7. The door or window frame according to claims 1 and 2, where the sealing means (12) comprise first seals (12a) positioned on the sash (3) and second seals (12b) positioned on the fixed frame (2), **characterised in that** in the door or window frame (1) third stable operating or ventilation configuration, the path for interception of the closing element (7a) in the auxiliary connecting element (13) results in moving the first seals (12a) from the fixed frame (2) and moving the sash (3) from the second seals (12b) at least along the movable stile (4a) and a partial section of the relative two movable rails (4b, 4c) contiguous with the movable stile (4a).

8. The door or window frame according to claims 5 and 6, **characterised in that** the cup-shaped body (15) comprises a lower body (15d) stably associated with the second groove (9) and the upper cup defined by the walls (15a, 15b) joined to each other at one end to form a closed seat; the cup-shaped body (15) having a first section (15c) of one wall (15a) extending at an angle and converging towards the inside of the cup-shaped body (15) to form a guided infeed path for the bolt (7a) in the cup-shaped body (15) with a relative limited opening stroke for the sash (3).

9. The door or window frame according to claims 5, 6 and 8, **characterised in that** the cup-shaped body (15) is divided into two specular portions, joined to form two closed seats, opposite one another, for housing the closing bolt (7a) and able to be positioned in the second groove (9) according to the type of door or window frame (1) opening; the central part of the cup-shaped body (15), where the two seats join, being constituted by the fixed connecting element (8a).

10. The door or window frame according to claim 9, **characterised in that** the cup-shaped body (15) with the connecting element (8a) is equipped with stable means (20) for fixing it to the second groove (9).

FIG.2

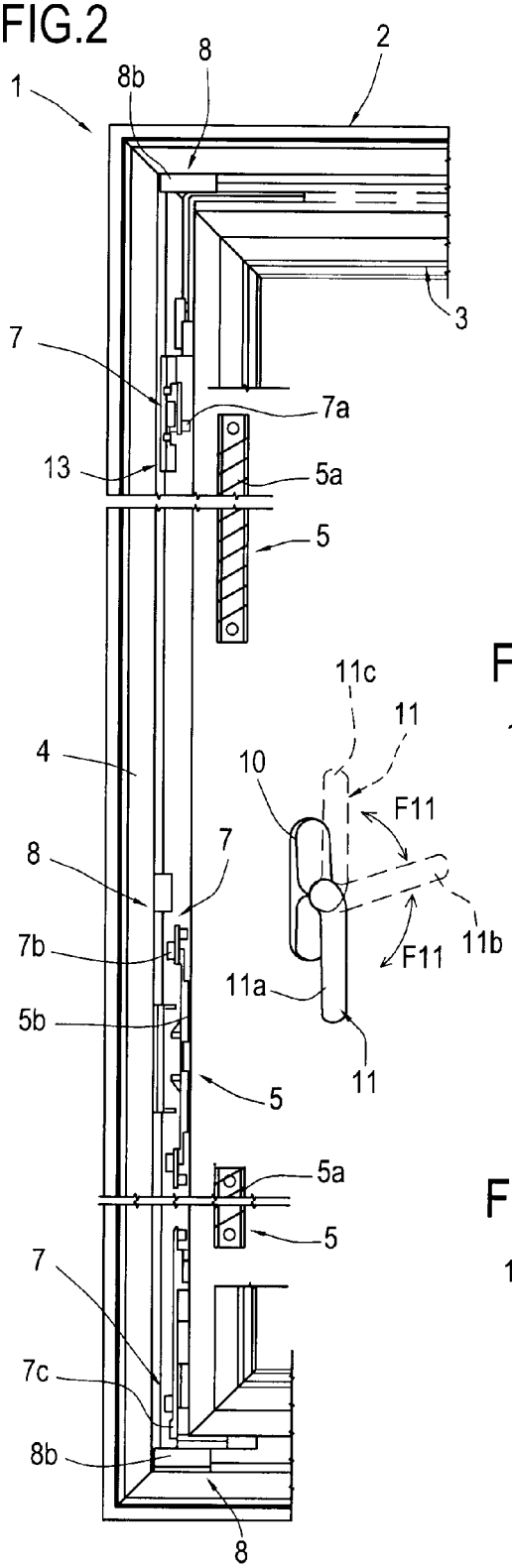


FIG.1

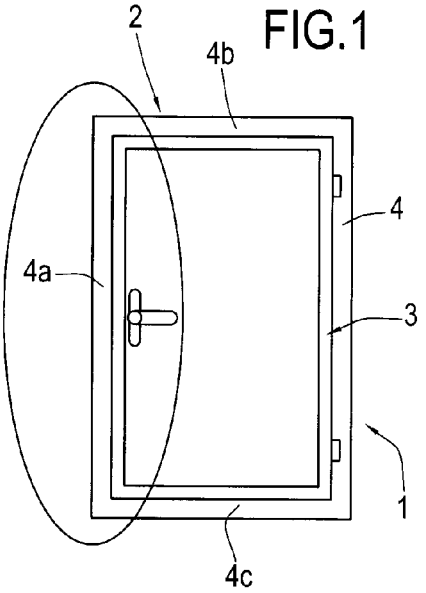


FIG.10

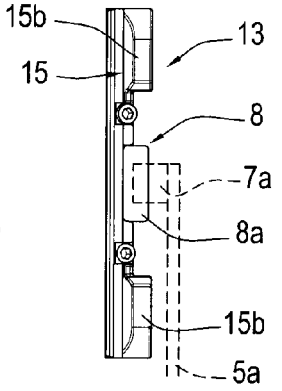


FIG.11

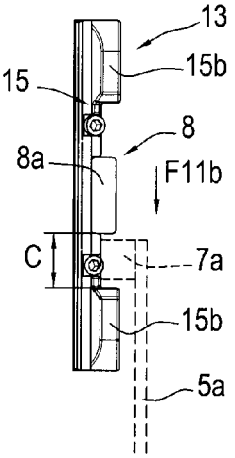


FIG.12

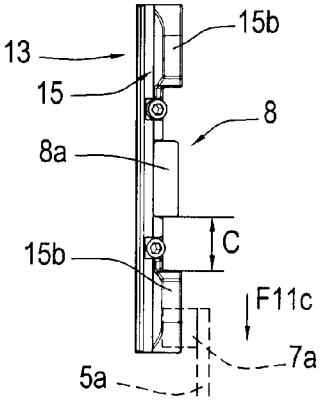
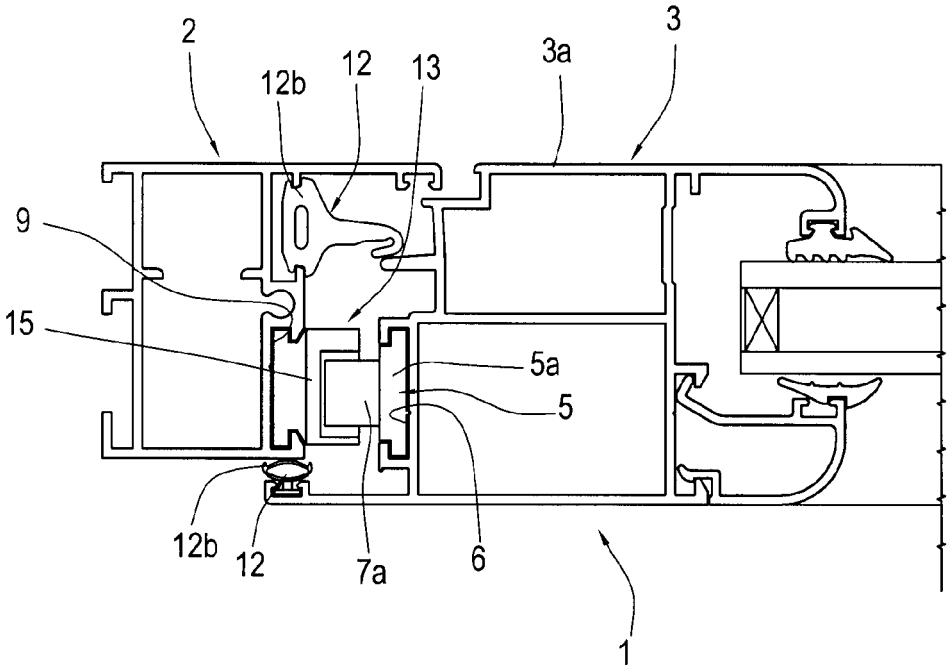


FIG.3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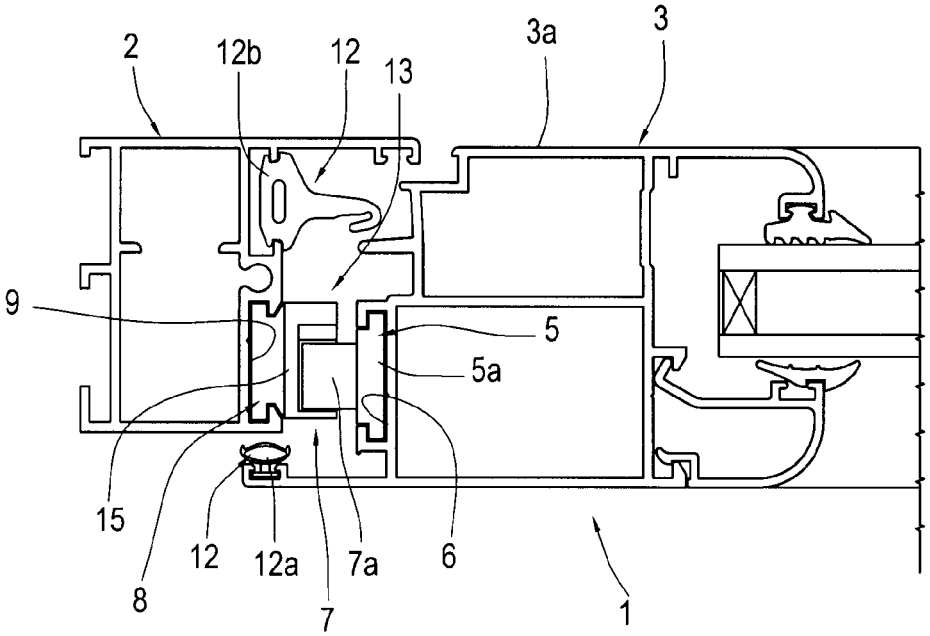
3
9
15
5a
5
12b
12
7a
6
1

FIG.4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5a
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7a
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8
7
1

FIG.5

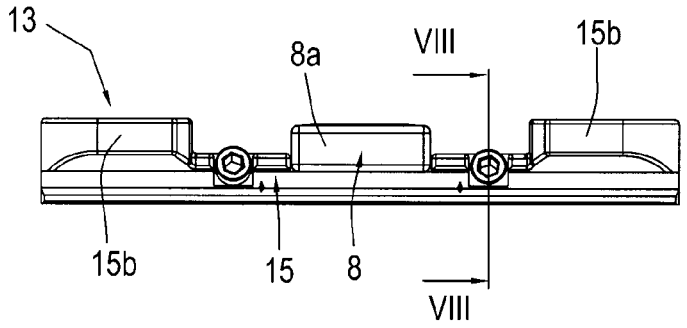

FIG.8

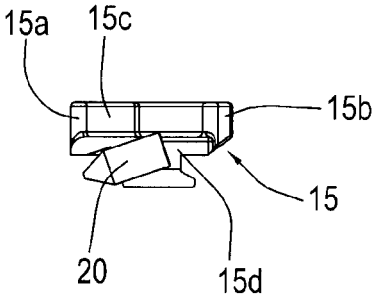

FIG.6

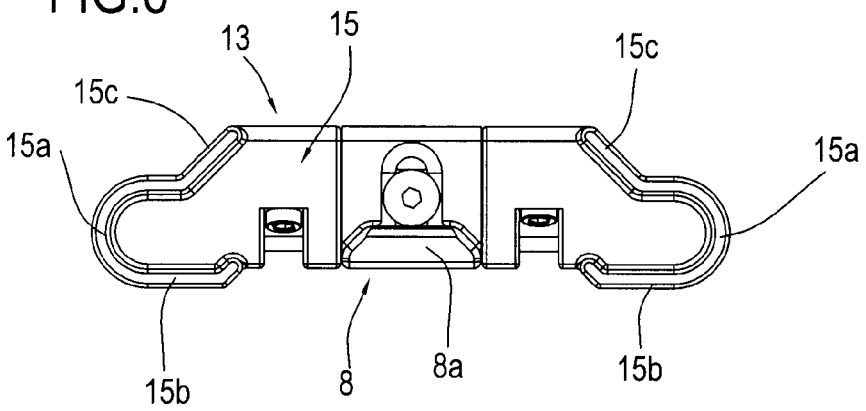

FIG.7

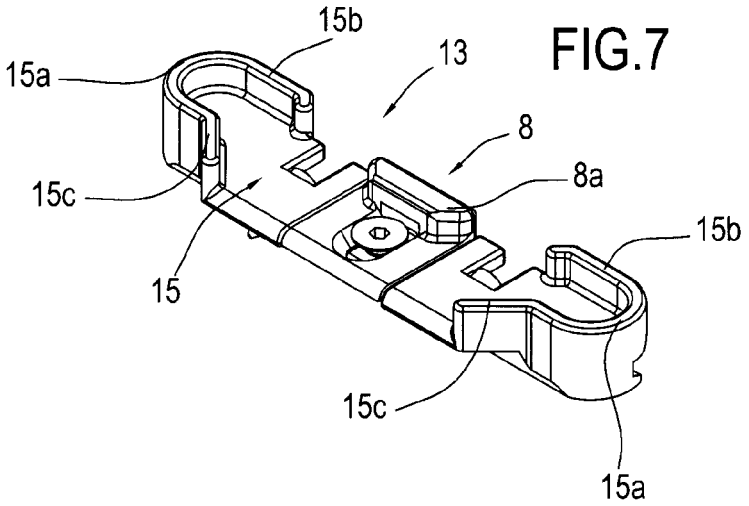

FIG.9