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(54) Self-adjusting closing system for window or door frames

(57) A self-adjusting closing system for window or door frames with a fixed frame (7) and at least one moving shutter (6) hinged thereto, comprising: an abutment (5) blocked to fixed frame (7) and formed by a surface (5a) parallel to a surface (7b) of the section bar of fixed frame (7) with a rounded edge (5b) and a protrusion (5c) having a surface (5d) perpendicular to surface (5a); and a cursor able to slide within a channel (6c) of the moving shutter (6) to said perpendicular surface (5d) of abutment (5).
Said perpendicular surface (5d) of protrusion (5c) occupies a portion of the whole length of abutment (5), and said cursor includes a pull-out member or button (2) able to move to a perpendicular direction to the movement of the cursor, said pull-out member or button (2) being able to engage with said protrusion (5c) of abutment (5).

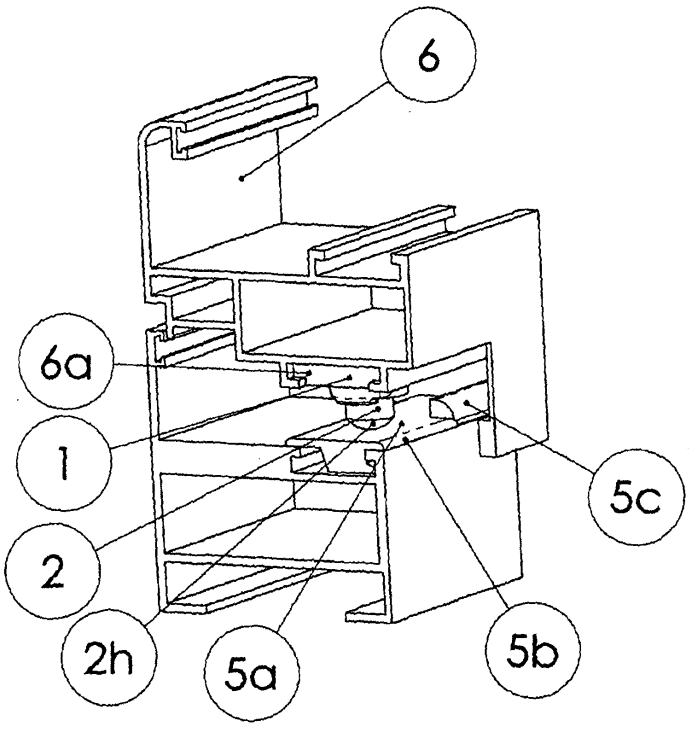

FIG. 6

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Description

[0001] The present patent application for industrial invention relates to a self-adjusting closing system for window or door frames.

[0002] One main problem felt by fitters of window or door frames is to compensate for the cutting mistakes of the components of the frame.

[0003] During the manufacturing of the section bars of frames and shutters, fitters often cannot keep to the standard size relations between frames and shutters.

[0004] Generally, frames have standard size that causes the distance between frame and shutter to be strictly bound. If such a distance is not respected, it is necessary to make use of accessories having their own adjustment means.

[0005] The most used method to close a window consisting of a fixed frame and a moving shutter hinged thereto on one side and rotating at the other side is to apply a member so-called "cursor" at the free side of the shutter and a member so-called "abutment" at the corresponding free side of the fixed frame.

[0006] The cursor controlled by mechanism of the known type slides within a channel formed into almost all section bars and disengages or engages the abutment fixed to the frame, thus causing the moving shutter to open or to close.

[0007] If the mutual distances between moving shutter and fixed frame are not respected, two opposed conditions are possible as follows.

[0008] If the moving shutter is too small with respect to the standard size of the fixed frame, the cursor and the abutment are farther than it is requested, thus causing an inadequate closure.

[0009] If the moving shutter is too large with respect to the standard size of the fixed frame, the cursor and the abutment are nearer than it is requested, thus colliding with each other so that it is impossible in praxis to close the window.

[0010] Under the above-mentioned conditions, the fitters must manufacture the wrong components of the window or door frames again or make use of accessories provided with their own adjustment means able to correct the greater or lower distance between moving shutter and fixed frame.

[0011] Of course, manufacturing the wrong components of the window or door frames again is certainly a hard work and, if the mistakes are due to inaccurate equipments, can also be useless.

[0012] Adjustable hinges able to rectify the distance between moving shutter and fixed frame are presently available on the market. A first drawback consists in that they are generally more expensive than the common hinges, and a second drawback is that they always need an additional adjustment.

[0013] The main object of the present invention is to overcome the drawbacks mentioned above by providing a self-adjusting closing system for window or door frames comprising a fixed abutment and a moving cursor, wherein the fixed abutment is fully blocked to the fixed frame and is formed by a portion parallel to the bottom of the channel of the section bar and a projection perpendicular thereto, and the moving cursor is able to slide within the channel of the section bar and is provided with a shaped hole within which a plunger provided with a dead hole receiving a spiral spring slides perpendicular to the bottom of the channel.

[0014] The cursor further includes a shaped closure plug able to be pushed against the spring and to press it partially and to be rotated preferably by 90° to engage two tongues of the cursor so that the spring is preloaded, thus keeping the button outside the body of the cursor.

[0015] Once assembled the button projects from the cursor and is free to move perpendicular to the bottom of the channel of the moving shutter with a stroke restricted by the closure plug to a direction by a suitable shoulder of the cursor.

[0016] When the moving shutter approaches the fixed frame, such button is able to be compressed against a portion of the abutment, thus matching the actual room, and during the closure movement it is able to slide, as known, into the section bar to engage a suitable projection of the abutment, thus providing the closure of the frame.

[0017] The advantages of a closing system for window or door frames according to the present invention are self-evident as the fitter needs not to perform any adjustment because of the presence of the cursor which fits automatically the room between fixed frame and moving shutter so that cursor and abutment always engage each other extremely well.

[0018] A better understanding of the invention will result from the following detailed description with reference to the accompanying drawings that show a preferred embodiment thereof only by way of a not limiting example.

[0019] In the drawings:

Figures 1 and 2 show an exploded view and a side cross-section view (some parts being removed for the sake of clarity) of some components of the cursor according to the invention, respectively;

Figure 3 is an isometric view of the abutment of the self-adjusting closing system according to the invention;

Figures 4 and 5 show an isometric view (some parts being removed for the sake of clarity) and a side view with an enlarged detail during a first closure step, respectively;

Figure 6 is an isometric view (some parts being removed for the sake of clarity) showing the invention during a second closure step;

Figure 7 is a side view (some parts being removed for the sake of clarity) with an enlarged detail showing the invention during the last closure step;

Figures 8A and 8B are a side view (some parts being removed for the sake of clarity) and a side cross-section view of the cursor alone in case the size of shutter and frame is essentially precise, respectively;

Figures 9A and 9B are a side view (some parts being removed for the sake of clarity) and a side cross-section view of the cursor alone in case the shutter is too large with respect to the frame, respectively;

Figures 10A and 10B are a side view (some parts being removed for the sake of clarity) and a side cross-section view of the cursor alone in case the shutter is too small with respect to the frame, respectively.

[0020] With reference to figures 1 and 2 the cursor is formed by a body (1) provided with a cavity in which a button (2) slides having a convex portion (2h) and a cylindrical portion (2a) sliding close to a surface (1a) inside body (1) and a base disc (2c) projecting from said cylindrical portion, which disc has two facets (2b, 2d) able to allow button (2) to enter the cavity of body (1) skimming over opposed tongues (1b, 1d) at the input end of said cavity. Said tongues project radially inwardly.

[0021] An axial hole (2e) is formed within button (2) and receives a spiral spring (3) which is preloaded and held in its position by a lower plug (4) which is able to engage with said opposed tongues (1b, 1d) of body (1) after rotation preferably by 90°.

[0022] According to the invention, button (2) when pushed by spring (3) pressed between surface (4b) of plug (4) and bottom surface (2g) of the dead hole of button (2) is able to slide axially into the cavity of body (1).

[0023] In particular, the movement of the button is guided by the slide coupling between the outside cylindrical surface (2a) of button (2) and the inside surface (1a) of body (1) concentric to the button and is restricted by the abutment of surface (2f) of base disc (2c) of button (2) against a shoulder (1f) of body (1) projecting radially inwardly.

[0024] With reference to figure 3, abutment (5) is formed by a even surface (5a) having a rounded edge (5b) directed to shutter (6) and a protrusion (5c) adjacent to said rounded edge (5b) on the same plane of even surface (5a) and provided with a surface (5d) perpendicular to said even surface (5a) and a rounded edge similar to rounded edge (5b).

[0025] With reference to figures 4 and 5, upon closing the door or window the convex surface (2h) of button (2) included in the cursor sliding within channel (6a) of moving shutter (6) hits the rounded edge (5b) of abutment (5) which is rigidly connected to channel (7a) of fixed frame (7).

[0026] Referring to figures 6 and 7, convex surface (2h) of button (2) pushed by rounded edge (5b) of abutment (5) upon closure comes into contact with even surface (5a) of abutment (5) causing button (2) to withdraw into body (1) and keeping the convex surface (2h) of button (2) still adjacent to surface (5a) of abutment (5).

[0027] This is due to spring (3) which is compressed between bottom (2g) of button (2) and lower plug (4) and causes button (2) to project outwards as far as possible.

[0028] The pressure of the convex surface (2h) of button (2) onto even surface (5a) produces a low friction causing the cursor to slide within channel (6a) of moving shutter (6) until it is positioned in front of protrusion (5c) of abutment (5), thus causing an interference between cylindrical surface (2a) of button (2) and perpendicular surface (5d) of protrusion (5c) and accordingly the closure of the window or door.

[0029] Referring to figures 8A to 10B, there is shown the action of spring (3) in case the distance between surface (6b) of moving shutter (6) and surface (7b) of fixed frame (7) is:

- correct (figs. 8A-8B);
- too small (figs. 9A-9B);
- too large (figs. 10A-10B).

[0030] Advantageously, the closing system according to the invention always ensures the adherence between convex surface (2h) of button (2) and surface (5a) of abutment (5) and performs a self-adjustment able to provide a tight closure because of the movement of button (2) perpendicular to bottom (6c) of channel (6a).

[0031] The present invention has been described and illustrated according to a preferred embodiment thereof, however, it is self-evident that a number of modifications and/or variations can be made without departing from the scope of the inventive concept. Moreover, all construction details can be replaced by technically equivalent components.

Claims

1. A self-adjusting closing system for window or door frames with a fixed frame (7) and at least one moving shutter (6) hinged thereto, comprising:

    - an abutment (5) blocked to fixed frame (7) and formed by a surface (5a) parallel to a surface (7b) of the section bar of fixed frame (7) with a rounded edge (5b) and a protrusion (5c) having a surface (5d) perpendicular to surface (5a); and
    - a cursor able to slide within a channel (6c) of the moving shutter (6) to said perpendicular surface (5d) of abutment (5);

    characterized in that said perpendicular surface (5d) of protrusion (5c) occupies a portion of the whole length of abutment (5), and said cursor includes a pull-out member or button (2) able to move to a perpendicular direction to the movement of the cursor, said pull-out member or button (2) being able to engage with said protrusion (5c) of abutment (5).

2. The self-adjusting closing system according to the preceding claim, **characterized in that** said cursor includes a body (1) provided with a cavity in which a button (2) slides having a convex portion (2h) and a cylindrical portion (2a) sliding close to a surface (1a) inside body (1) and a base disc (2c) projecting from said cylindrical portion, which disc has two facets (2b, 2d) able to allow button (2) to enter the cavity of body (1) skimming over opposed tongues (1b, 1d) at the input end of said cavity, said tongues projecting radially inwardly.

3. The self-adjusting closing system according to the preceding claim, **characterized in that** an axial hole (2e) is formed within button (2) and receives a spiral spring (3) which is preloaded upon assembling and held in its position by a lower plug (4) which is able to engage with said opposed tongues (1b, 1d) of body (1) after rotation by a suitable angle.

4. The self-adjusting closing system according to the preceding claim, **characterized in that** button (2) is able to slide axially into the cavity of body (1) when pushed by spring (3) pressed between surface (4b) of plug (4) and bottom surface (2g) of the dead hole of button (2), the movement of the button being guided by the slide coupling between outside cylindrical surface (2a) of button (2) and inside surface (1a) of body (1) concentric to the button and being restricted by the abutment of surface (2f) of base disc (2c) of button (2) against a shoulder (1f) of body (1) projecting radially inwardly.

5. The self-adjusting closing system according to claim 1, **characterized in that** abutment (5) is formed by a even surface (5a) having a rounded edge (5b) directed to shutter (6) and a protrusion (5c) adjacent to said rounded edge (5b) on the same plane of even surface (5a) and provided with a surface (5d) perpendicular to said even surface (5a) and a rounded edge similar to rounded edge (5b).

6. The self-adjusting closing system according to claims 2 and 5, **characterized in that** upon closing the door or window the convex surface (2h) of button (2) is able to hit the rounded edge (5b) of abutment (5) which is rigidly connected to channel (7a) of fixed frame (7) and to come into contact with even surface (5a) of abutment (5) causing button (2) to withdraw into body (1) and keeping the convex surface (2h) of button (2) still adjacent to surface (5a) of abutment (5).

7. The self-adjusting closing system according to claims 3 and 6, **characterized in that** the pressure of the convex surface (2h) of button (2) onto even surface (5a) produces a low friction causing the cursor to slide within channel (6a) of moving shutter (6) until it is positioned in front of protrusion (5c) of abutment (5), thus causing an interference between cylindrical surface (2a) of button (2) and perpendicular surface (5d) of protrusion (5c) and accordingly the closure of the window or door.

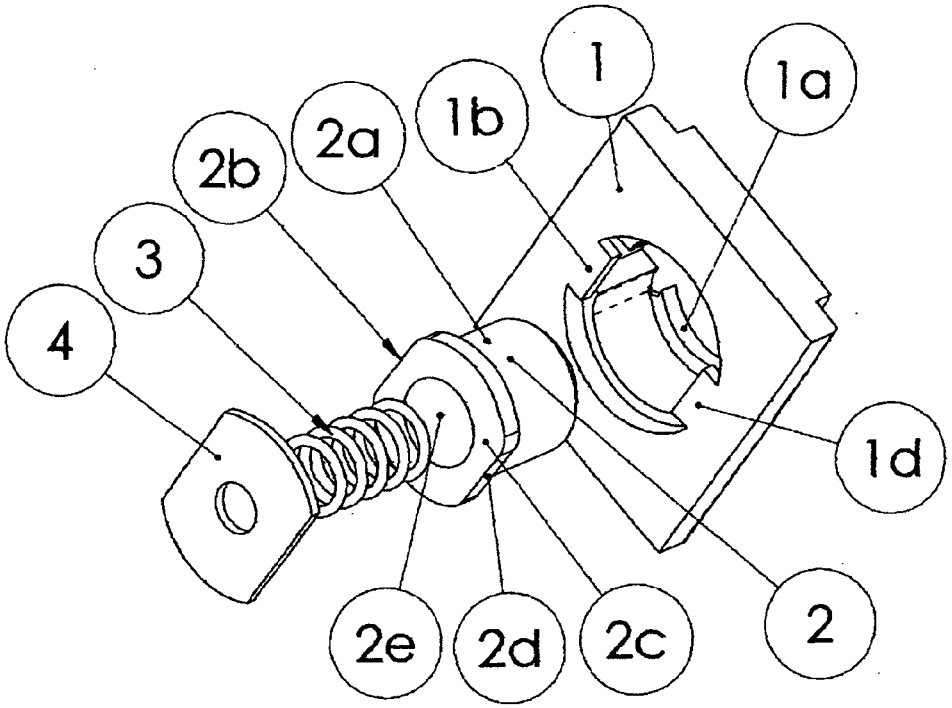

FIG. 1

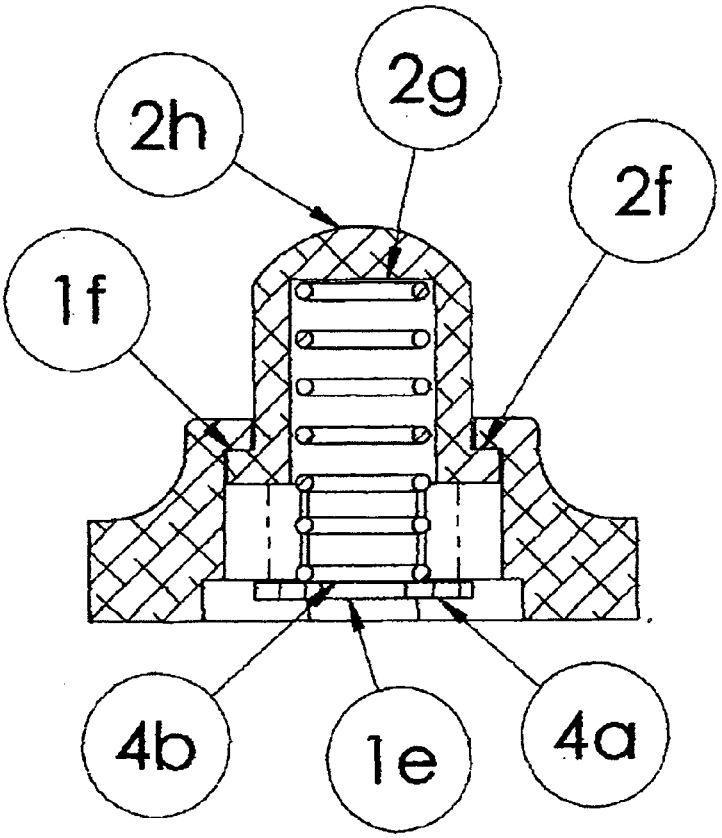

FIG. 2

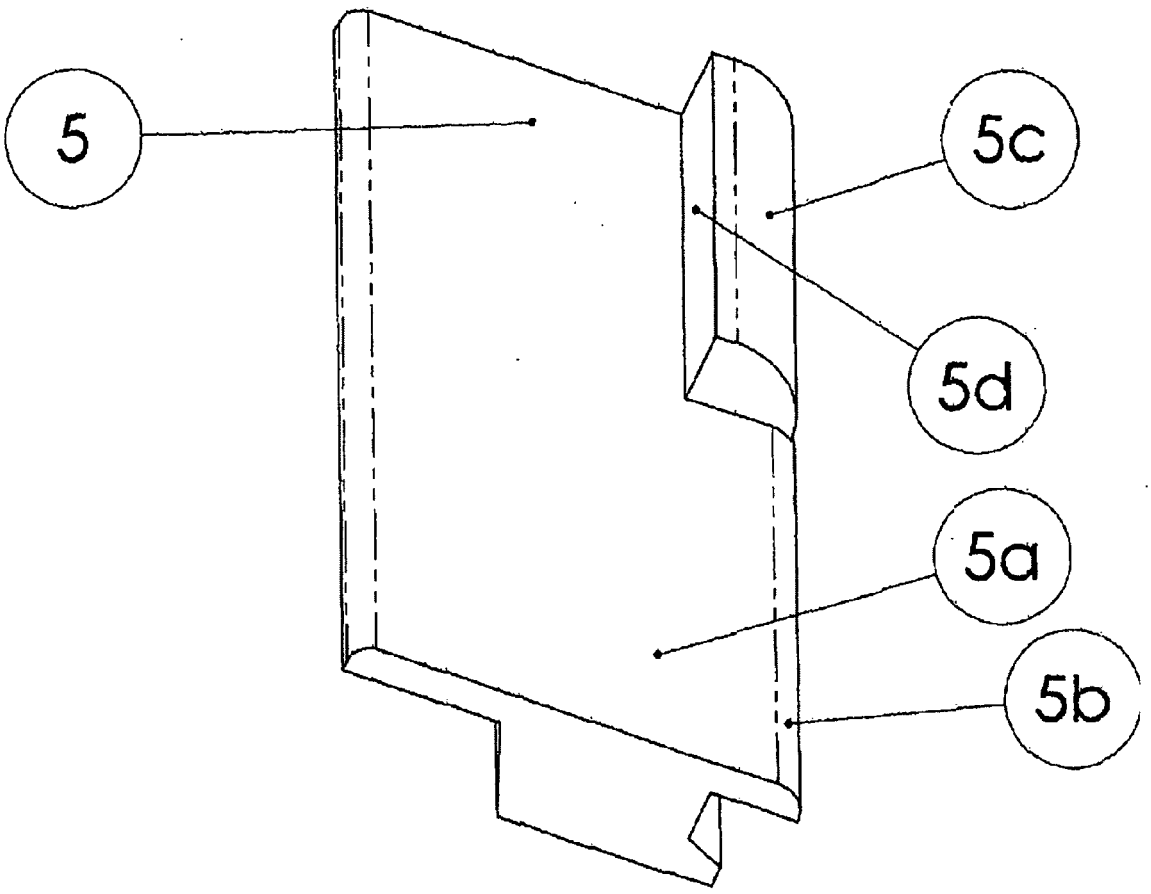

FIG. 3

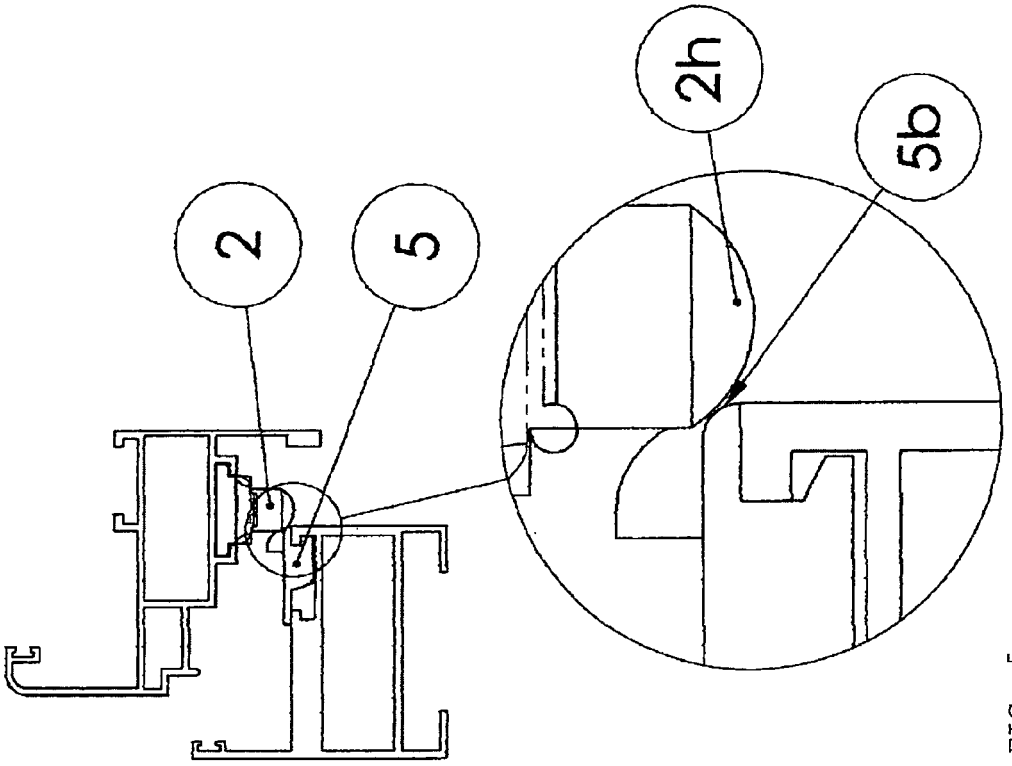

FIG. 5

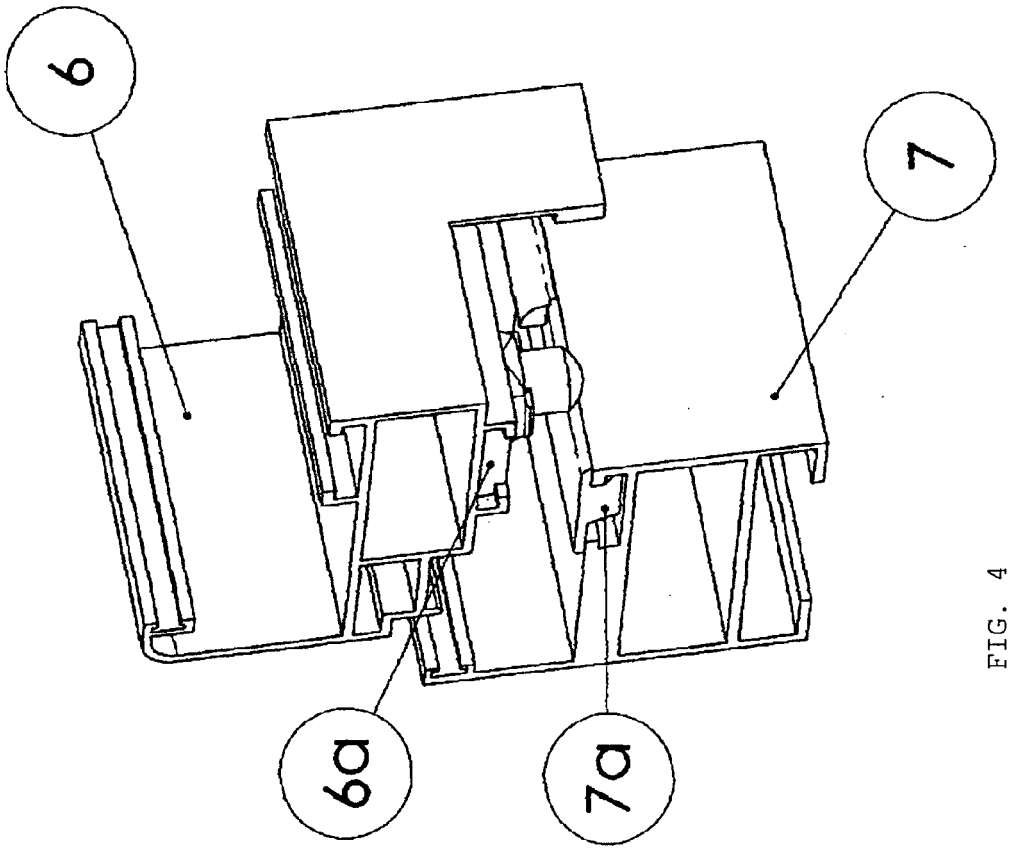

FIG. 4

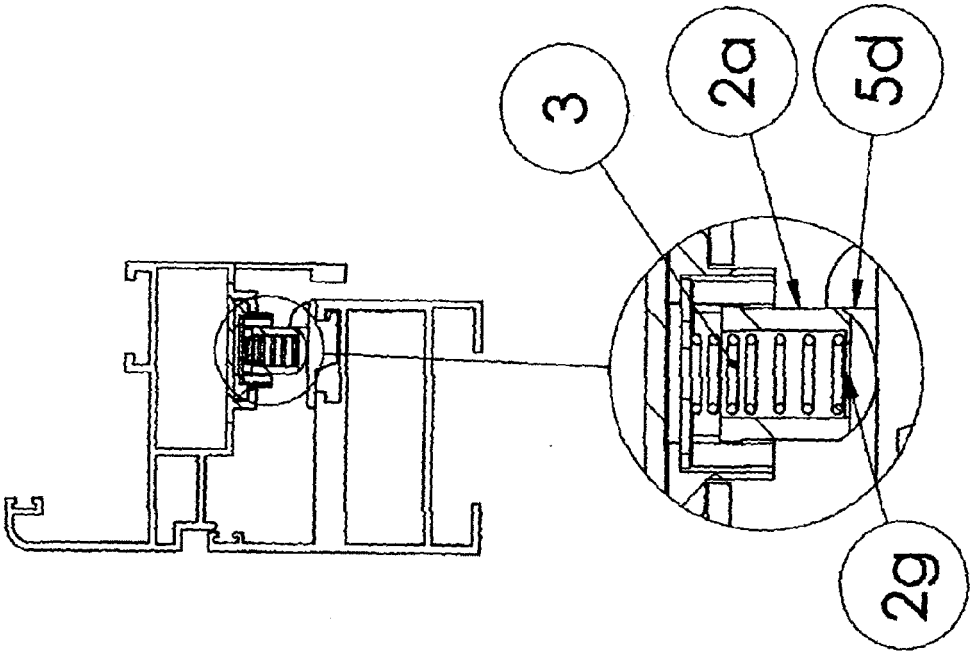

FIG. 7

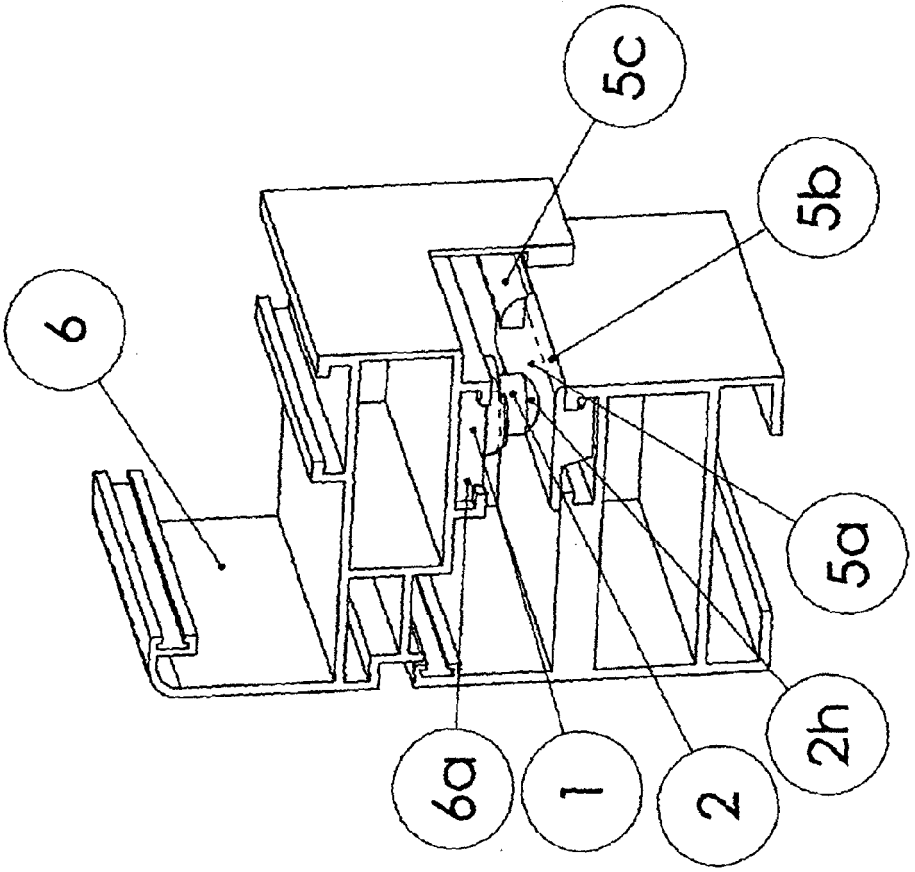

FIG. 6

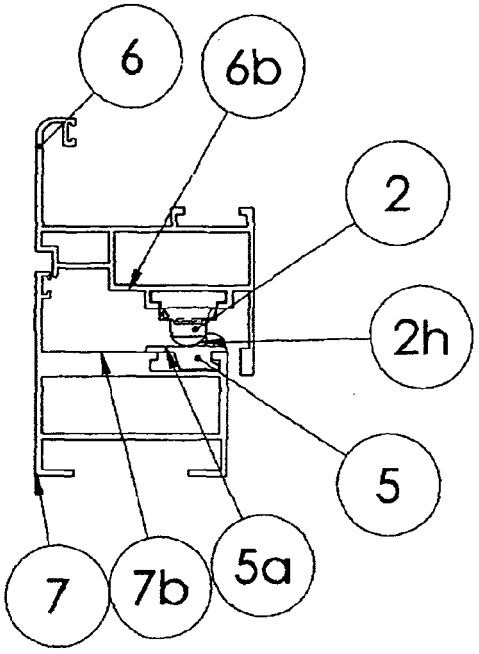

FIG. 8B

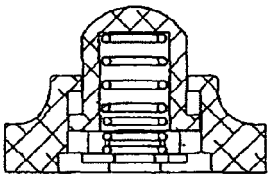

FIG. 8A

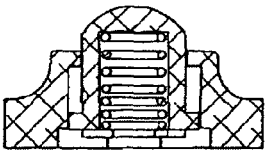

FIG. 9A

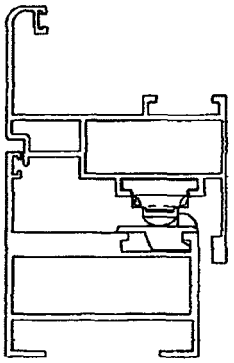

FIG. 9B

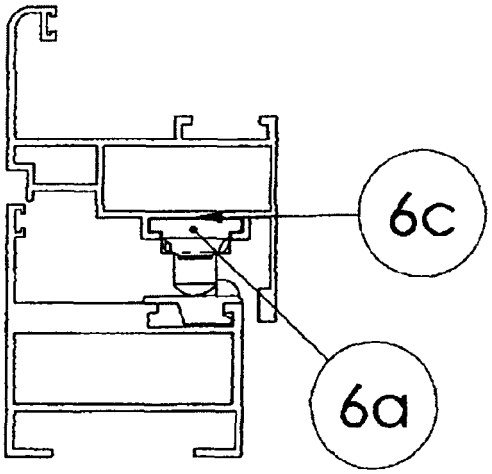

FIG. 10B

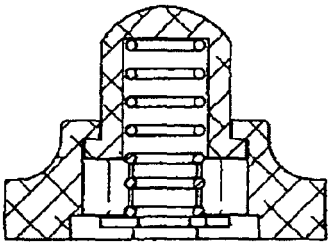

FIG. 10A