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(54) **Hermetic closure device for sliding doors and windows**

(57) The present invention relates to a closure device that achieves a hermetic closure and that is mainly applied in the field of sliding doors and windows.

The device is **characterized in that** it comprises at least one flat bar located inside a profile of a movable sheet and capable of longitudinal sliding over the same, this flat bar being connected with a hermeticity element capable of coming into contact with a frame profile in order to perform a hermetic closure so that, in the closure position of the movable sheet, by sliding the flat bar over the profile of the movable sheet the hermeticity element can vary between a first position wherein no contact exists between it and the frame profile and a second position wherein it does exist.

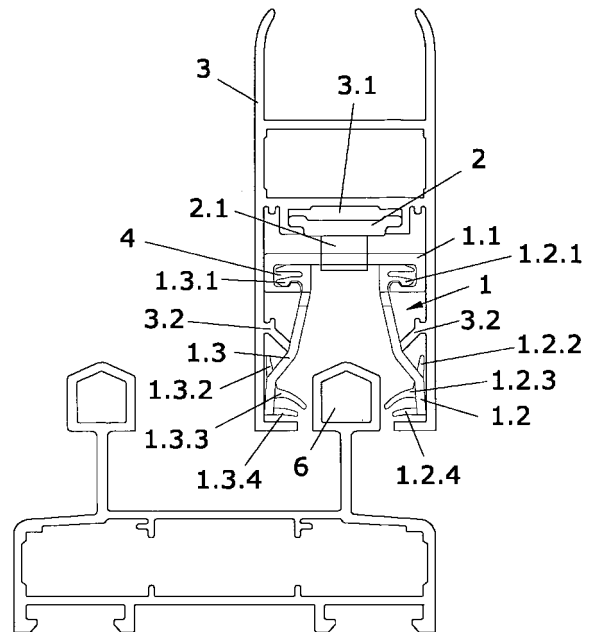


FIG.1

Description**OBJECT OF THE INVENTION**

[0001] The present invention relates to a closure device that achieves a hermetic closure and that is mainly applied in the field of sliding doors and windows.

[0002] The device is **characterized in that** it comprises at least one flat bar located inside a profile of a movable sheet and capable of longitudinal sliding over the same, this flat bar being connected with a hermeticity element capable of coming into contact with a frame profile in order to perform a hermetic closure so that, in the closure position of the movable sheet, by sliding the flat bar over the profile of the movable sheet the hermeticity element can vary between a first position wherein no contact between it and the frame profile exists, and a second position wherein hermetic contact between it and the frame profile does exist.

BACKGROUND OF THE INVENTION

[0003] In the field of sliding doors and windows, the use of felts longitudinally installed inside each one of the frames of the movable sheet frames so as to obtain a greater grade of closure against outside and foreign particles, is known. This closure presents the drawback of not being fully hermetic.

[0004] Hermetic closing systems applicable to sliding doors and windows are also known, but their complexity raise the cost of the product whereby is only applied to large dimension and weight sliding doors. This system comprises some fittings manually actuated by the user through a lever when the door is closed; lifting up the sliding sheet such that this presses the rubbers inserted in the frames. Due to the high cost of this mechanism, it is only applied in large dimension sliding doors which weight of each movable sheet can be 1,102.31 lb.

[0005] The device object of this invention achieves a hermetic closure without the need of having to perform the lifting action of the movable sheet, with a lower cost device and applicable to both sliding doors and windows of any dimension.

DESCRIPTION OF THE INVENTION

[0006] The invention relates to a hermetic closure device applicable to sliding doors and windows.

[0007] The device is placed inside the profile of the movable sheet and intended to be coupled to the frame profile such that a hermetic closure is performed between both profiles.

[0008] The device comprises at least one flat bar that can longitudinally slide inside the profile of the movable sheet. This flat bar is also connected to a hermeticity element capable of coming into contact with the frame profile in order to perform the hermetic closure when the movable sheet is placed in the closure position.

[0009] By sliding of the flat bar over the profile of the movable sheet, the hermeticity element can vary between a first position and a second position, in the first position wherein there is not hermetic contact between the hermeticity element and the frame profile so that there is no hermetic closure. It may be that there is no contact between both elements, or that contact does exist between the hermeticity element and the frame profile but not sufficiently enough so as to achieve a hermetic closure.

[0010] The second position is that wherein hermetic contact between the hermeticity element and the frame profile does exist.

[0011] In this way the flat bar sliding causes the movement of the hermeticity element between a position wherein there is no hermetic contact with the frame profile and another wherein there is a hermetic contact between both elements.

[0012] The device can be installed on the closure side profile and on the upper and lower profile of the movable sheet.

DESCRIPTION OF DRAWINGS

[0013] The present specification is complemented with some planes illustrating the preferred example and in no way limiting the invention.

Figure 1 is a sectional view of a first embodiment example of the device object of the invention of the fixed frame profile with the movable sheet in closure position and the device object of the invention in open position, that is, non-hermetic closure.

Figure 2 is a sectional view of the fixed frame profile with the movable sheet in closure position and the device corresponding to figure 1 in hermetic closure position.

Figure 3 is a plant and longitudinal sectional view of the embodiment example corresponding to figure 1 in hermetic closure position.

Figure 4 is a perspective view of the embodiment example corresponding to figure 1.

Figure 5 is a sectional view of a second embodiment example of the device object of the invention of the fixed frame profile with the movable sheet in closure position and the device object of the invention in open position, that is, non-hermetic closure.

Figure 6 is a sectional view of fixed frame profile with the movable sheet in closure position and the device corresponding to figure 5 in hermetic closure position.

Figure 7 is a perspective view of the hermeticity element and flat bar corresponding to the embodiment example of figure 5.

Figure 8 is a perspective view of both flat bars corresponding to the embodiment example of figure 5.

PREFERRED EMBODIMENT OF THE INVENTION

[0014] The hermeticity element (1) has a shaped-U section, presenting a base (1.1) and two walls (1.2, 1.3) intended to embrace the frame profile (6). Such hermeticity element (1) can consist of a single body, according to the embodiment example showed in figures 5 to 8, or can consist, according to the embodiment example showed in figures 1 to 4, of three independent pieces, two side walls (1.2, 1.3) are joined to the base (1.1) by introducing their ends (1.2.1, 1.3.1) into a channel (4) of the base (1.1), such ends (1.2.1, 1.3.1) being preferably fixed through clips.

[0015] Each one of these two side walls (1.2, 1.3) includes a flap wherewith the hermeticity of the closure is obtained. Each one includes a flap (1.2.3, 1.3.3) intended to come into contact with the frame profile (6) for the hermetic closure. Additionally they can comprise another pair of flaps (1.2.4, 1.3.4).

[0016] The base (1.1) of the hermeticity element (1) presents windows (1.4) wherein some tabs (2.1) of the flat bar (2) are housed and between which another hole (1.5) is made. The tabs (2.1) are tilted with respect to the flat bar (2). In this way, when longitudinally sliding the flat bar (2) over the profile (3) of the movable sheet the hermeticity element (1) slides over the tabs (2.1) of the flat bar (2) distancing from or approaching to it (2), that is, varying the relative position between both elements (1, 2).

[0017] The actuator mechanism of the hermeticity element (1) is then characterized, in the embodiment examples, by presenting a flat bar (2) that directly acts on the base (1.1) of the hermeticity element (1).

[0018] Such flat bar (2) presents a series of flaps (2.1) distributed into pairs. These flaps (2.1) come up with a certain tilting from one of the faces of the flat bar (2), initially presenting a curved section. A slide bar (5) of certain length is made in the flat bar (2) and between the pairs of flaps (2.1). This slide bar (5) is complemented with the hole (1.5), not showed in the embodiment corresponding to figures 5 to 8, of the base (1.1) of the hermeticity element (1) since a pin will be inserted therein which is fixed to the base (1.1) sliding over the slide bar (5) of the flat bar (2). This sliding in one direction or another is what will cause the approach or distance of both pieces (2, 1.1), whereby the aperture and the hermetic closure of the object of the invention will be produced. The length of the slide bar (5) made in the flat bar (2) bounds the flat bar (2) movement with the aim of preventing its flaps (2.1) from come out the windows (1.4) made on the base (1.1) wherein they are inserted.

[0019] The profile (3) of the movable sheet comprises pushing means for the walls (1.2, 1.3) of the hermeticity element (1) in the housing of the hermeticity element (1).

[0020] In the embodiment examples the profile (3) presents some flaps (3.2) made on both inner faces of its side walls (1.2, 1.3). Their functions are several:

- they serve as guide for inserting the hermeticity element (1) into the profile (3) of the movable sheet.
- they cause the approach and distance of the side walls (1.2, 1.3) of the hermeticity element (1).
- they support the hermetic closure by being complemented with the flaps (1.2.2 and 1.3.2) presenting the side walls (1.2 and 1.3) of the hermeticity element (1).

[0021] Once the user inserts the movable sheet of the sliding door or window inside the fixed frame, he/she actuates the lever for closing it and thus prevents its aperture from outside. But by actuating said lever, not only its closure will be obtained but also the hermetic system object of the invention is actuated.

[0022] Before actuating the lever for closing the door and the hermeticity element (1), the device object of the invention will be in the position depicted in figures 1, 2 and 5. In which the flat bar (2) is separated in a distance (x) from the base (1.1) of the hermeticity element (1), wherein the flaps (2.1) of the flat bar (2) come into contact with the base (1.1) through the windows (1.4). The initial curve presented by such flaps (2.1) is what causes, with very little displacement of the flat bar (2), the distance of the base (1.1) from the flat bar (2).

[0023] When the user actuates the lever, he/she will close the door and the hermetic system object of the invention. The closure of the hermeticity element (1) will be caused displacing of the flat bar (2) so that its curved sections will be released from the windows (1.4) of the base (1.1) and then will be the posterior face of such flaps (2.1) which presses the base (1.1) of the hermeticity element by approaching it up to come into contact with the flat bar (2). This movement is complemented with the flaps (3.2) presented by the profile (3) at its two side walls (1.2, 1.3) and the tilted section presented by them (1.2, 1.3). When the base (1.1) approaches to the flat bar (2), the flaps (3.2) come into contact with the tilted section of the side walls (1.2, 1.3) and due to this tilting both walls (1.2, 1.3) approach each other, whereby the aperture of the hermeticity element (1) is closed achieving that the flaps (1.2.3, 1.2.4, 1.3.3, 1.3.4) pressure contact the inner wall (6) of the fixed frame forming the hermetic closure of the system. On the other hand, in closure position, the flaps (3.2) of the profile (3) and the flaps (1.2.2, 1.3.2) of the side walls (1.2, 1.3) of the hermeticity element (1) come into contact forming a second hermetic closure in order to prevent the introduction of foreign particles inside the profile (3) of the movable sheet.

[0024] In order to open the hermeticity element (1), the user only has to actuate the lever in the rotating direction opposite to that of the closure, wherewith the flat bar (2) will be displaced approaching the flaps (2.1) to one of the sides of the windows (1.4) of the base (1.1). This approaching will cause that the curved section of the anterior face of such flaps (2.1) acts on the base (1.1) thus distancing it from the flat bar (2) creating the separation distance (x). The movement for separating the base (1.1)

from the flat bar (2) will form the separation of the flaps (3.2) of the profile (3) of the movable sheet from the flaps (1.2.2, 1.3.2) of the side walls (1.2, 1.3) of the hermeticity element and furthermore the tilted section of such walls complemented with the flaps (3.2) will cause the distance between the walls (1.2 and 1.3), forming the aperture of the hermetic closure.

[0025] Preferably the hermeticity element (1) will be plastic. In order to guarantee the closure/aperture movement of the side walls (1.2 and 1.3) during the sliding door or window lifespan, it has been forecasted to provide them with a rubber sheet in the bending area. The plastic has a deformation which will tend to be plastic with the repetitive use of the aperture and closure of the system, which would prevent the correct function of the system. Furthermore, the repetitive bending of the plastic would probably carry its breakage and it is by these two reasons that the bending point of both walls of the hermeticity element has been physically materialized into rubber. In order to guarantee the hermetic closure of the system, the flaps of the side walls (1.2, 1.3) of the hermeticity element (1) are also made of rubber, being perfectly adapted to the surface wherewith will come into pressure contact.

[0026] The device comprises supporting means for the flat bar (2) so that the flat bar (2) can perform the longitudinal displacement relative to the profile (3) of the movable sheet.

[0027] In the embodiment example showed in figures 1 to 4, the supporting means comprise a guide (3.1) in the profile (3) of the movable sheet that allows the longitudinal sliding in both directions.

[0028] In the embodiment example showed in figures 5 to 8, the supporting means comprise a second flat bar (7) that is joined to profile (3) of the movable sheet. The joining means consist of a pin which through the slide bar (5) crosses the flat bar (2) and the base (1.1) of the hermeticity element (1) through the hole (1.5) of the base (1.1). The length of such slide bar (5) meets the desired length of the flat bar (2) displacement.

[0029] The second embodiment further presents the advantage of having a greater mounting easiness since in the first solution, the flat bar (2) has to be introduced into the guide (3.1) of the profile (3) of the movable sheet from one of the ends and before assembling the whole frame, and in the second embodiment its introduction into the profile (3) of the movable sheet is frontally performed from outside and can be performed once the whole frame of the movable sheet is assembled.

[0030] Due to the location of the flat bars (2, 7) the last finish is different in both embodiments, as shown in the attached figures. By seeing inside the profile (3) of the movable sheet in the first embodiment example, the hermeticity joint (1) and the holes made at its base (1.1) are observed, whereas in the second embodiment only the walls of hermeticity joint (1) and the flat bar (7) having a width covering almost all the base (1.1) of the hermeticity joint (1) are seen, whereby the device presents a better

finish.

[0031] If the profile (3) of the movable sheet, in the first embodiment example of the invention, is seen from its open end, the hermeticity element (1) and the flaps (2.1) of the flat bar (2) protruding from the windows (1.4) of the base (1.1) are observed. The flat bar (2) is placed at the posterior part of the hermeticity element (1), housed into its corresponding guide (3.1). The second embodiment of the device consists of placing the flat bar (2) facing the anterior part of the hermeticity element (1), such flat bar (2) being housed in the inner channel of such element (1). In order to attain the same effect, the flaps (2.1) are located inside the windows (1.4) of the base (1.1) in a resting position. In the closure operation, the flat bar (2) will be displaced in a direction and its flaps (2.1) will go back to their respective windows so that when coming into contact with the base (1.1), they will press it causing its approach to the flat bar (2) and consequently the approach between the walls (1.2 and 1.3) of the hermeticity element thus obtaining the hermetic closure of the system.

[0032] In both embodiments, the flat bar (2) as well as the hermeticity element (1) can occupy the highest part of the profile length of the movable sheet, leaving a clearance at its ends for allowing the sliding in both directions of the flat bar (2).

Claims

1. Hermetic closure device for sliding doors and windows, **characterized in that** it comprises at least one flat bar (2) placed inside a profile (3) of a movable sheet and capable of longitudinal sliding over the same (3), this flat bar (2) being connected to a hermeticity element (1) capable of coming into contact with a frame profile (6) in order to perform a hermetic closure so that the flat bar (2) sliding varies the hermeticity element (1) between a first position wherein no hermetic contact exists between the hermeticity element (1) and the frame profile (6) and a second position wherein the hermetic contact between the hermeticity element (1) and the frame profile does exist.
2. Hermetic closure device for sliding doors and windows, according to claim 1, **characterized in that** between the flat bar (2) and the hermeticity element (1) at least one tab (2.1) tilted with respect to the flat bar (2) in combination with a window (1.4) is arranged in the hermeticity element (1) so that when sliding the flat bar (2) a variation of the relative position between both elements (1, 2) is caused.
3. Hermetic closure device for sliding doors and windows, according to claim 2, **characterized in that** the flat bar (2) comprises a slide bar (5) complemented with a hole (1.5) of the hermeticity element (1)

which an element fixed to the base (1.1) has inserted therein for sliding the flat bar (2) through the slide bar (5).

4. Hermetic closure device for sliding doors and windows, according to any of the preceding claims, **characterized in that** it comprises supporting means of the flat bar (2) for its longitudinal displacement. 5
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5. Hermetic closure device for sliding doors and windows, according to claim 4, **characterized in that** the supporting means comprise a guide (3.1) for the flat bar (2) in the profile (3) of the movable sheet. 15
6. Hermetic closure device for sliding doors and windows, according to claim 4, **characterized in that** the supporting means comprise a second flat bar (7) joined to the profile (3) of the movable sheet. 20
7. Hermetic closure device for sliding doors and windows, according to any of the preceding claims, **characterized in that** the hermeticity element (1) comprises a base (1.1) and two side walls (1.2, 1.3) intended to embrace the frame profile (6). 25
8. Hermetic closure device for sliding doors and windows, according to claim 7, **characterized in that** the base (1.1) and both side walls (1.2, 1.3) form a single body. 30
9. Hermetic closure device for sliding doors and windows, according to claim 7, **characterized in that** the base (1.1) and both side walls (1.2, 1.3) form different bodies. 35
10. Hermetic closure device for sliding doors and windows, according to claim 7, **characterized in that** both side walls (1.2, 1.3) comprise a pair of flaps (1.2.3, 1.3.3) intended to come into contact with the frame profile (6) for the hermetic closure. 40
11. Hermetic closure device for sliding doors and windows, according to claim 10, **characterized in that** it comprises another pair of additional flaps (1.2.4, 1.3.4). 45
12. Hermetic closure device for sliding doors and windows, according to claim 7, **characterized in that** the profile of the movable sheet (3) comprises pushing means for the walls (1.2, 1.3) of the hermeticity element (1) in the housing of the hermeticity element (1). 50
13. Hermetic closure device for sliding doors and windows, according to claim 12, **characterized in that** these means comprises some flaps (3.2) on the inner face of the profile (3). 55

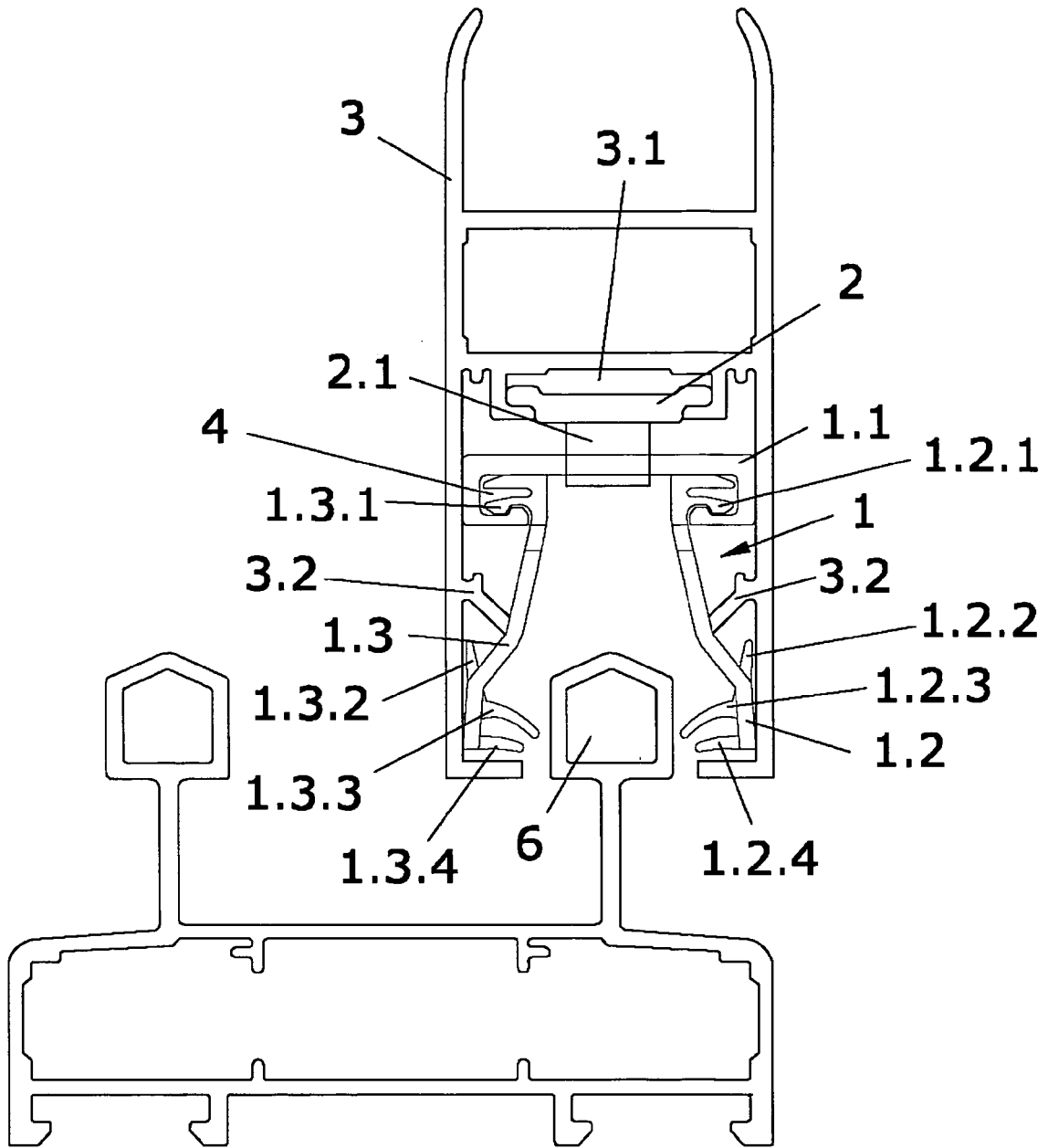


FIG.1

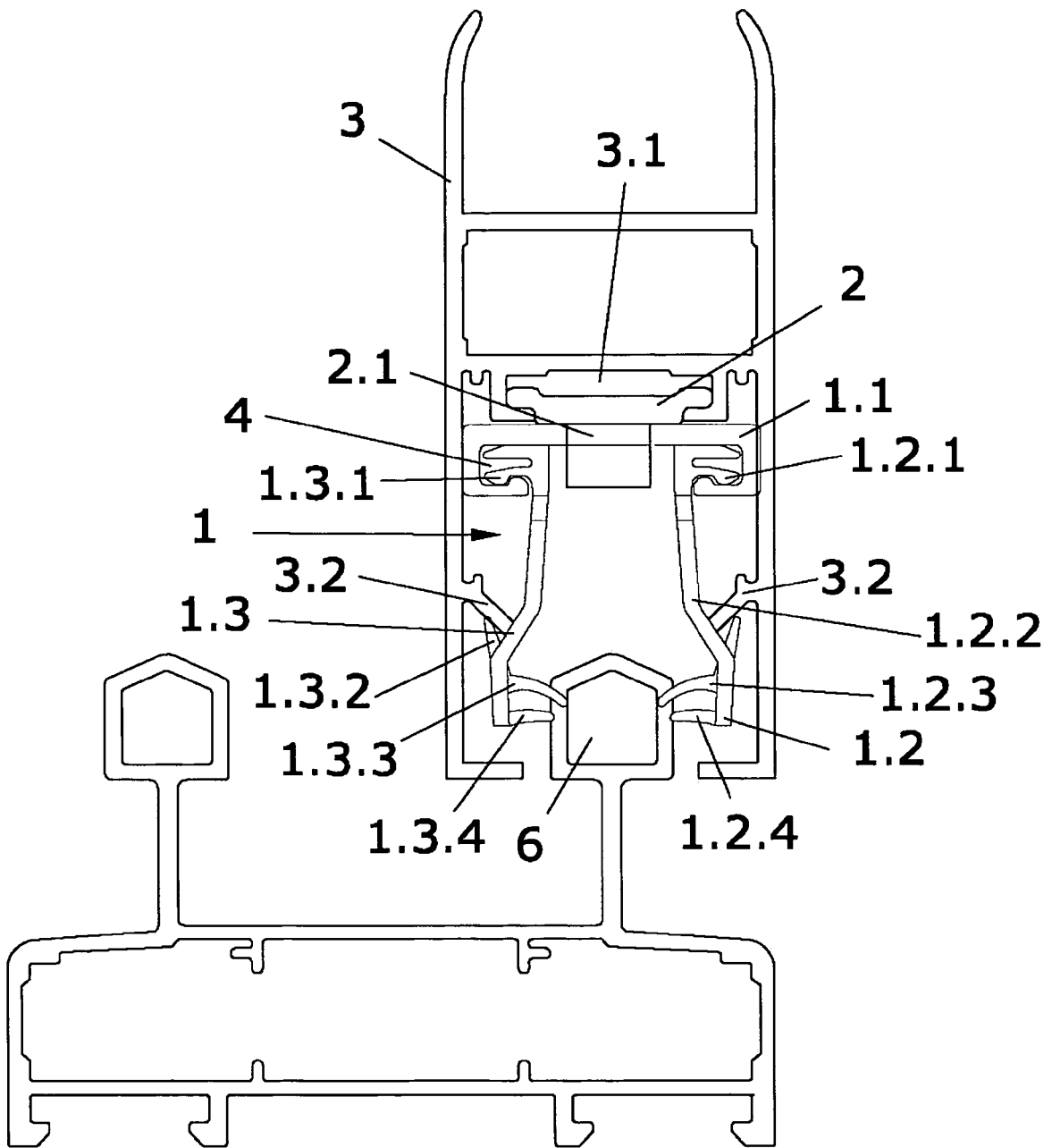


FIG. 2

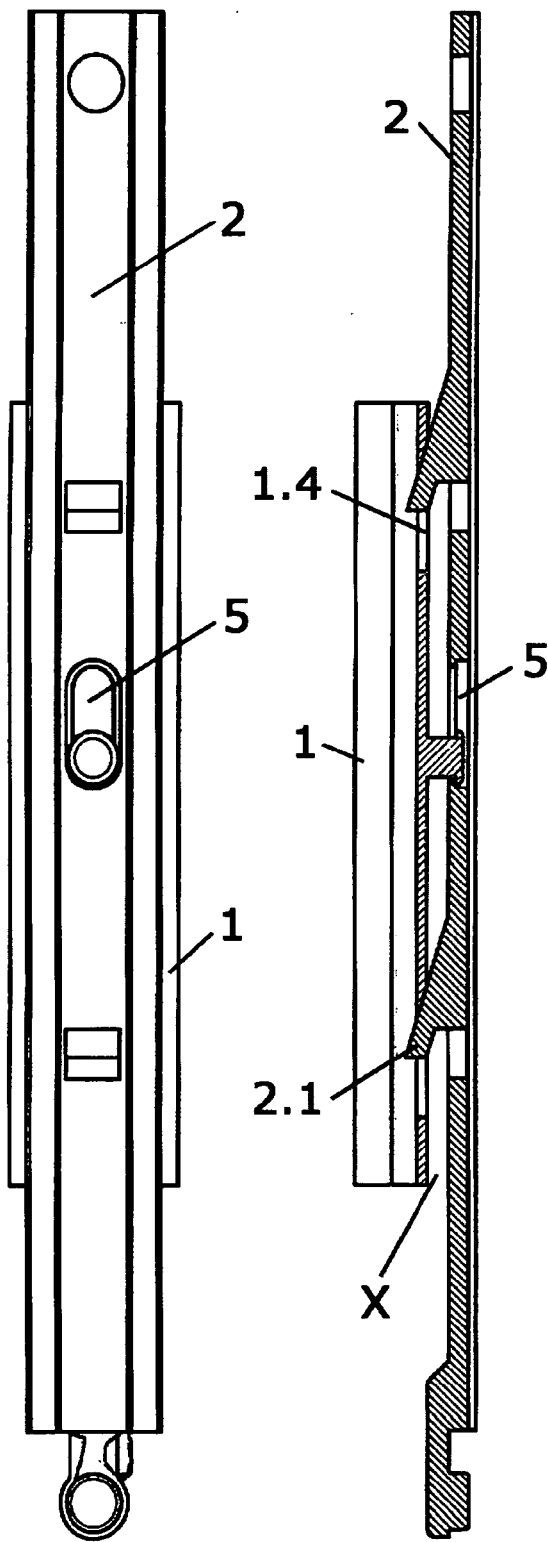


FIG. 3

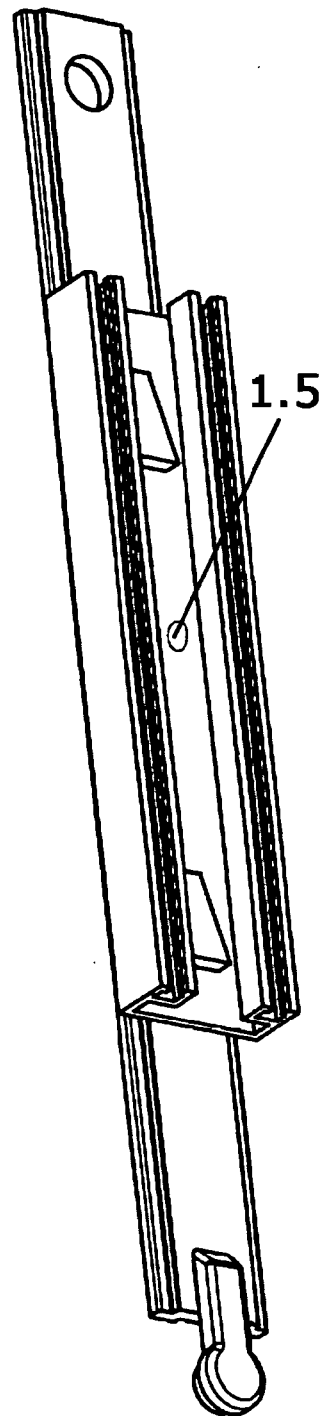


FIG. 4

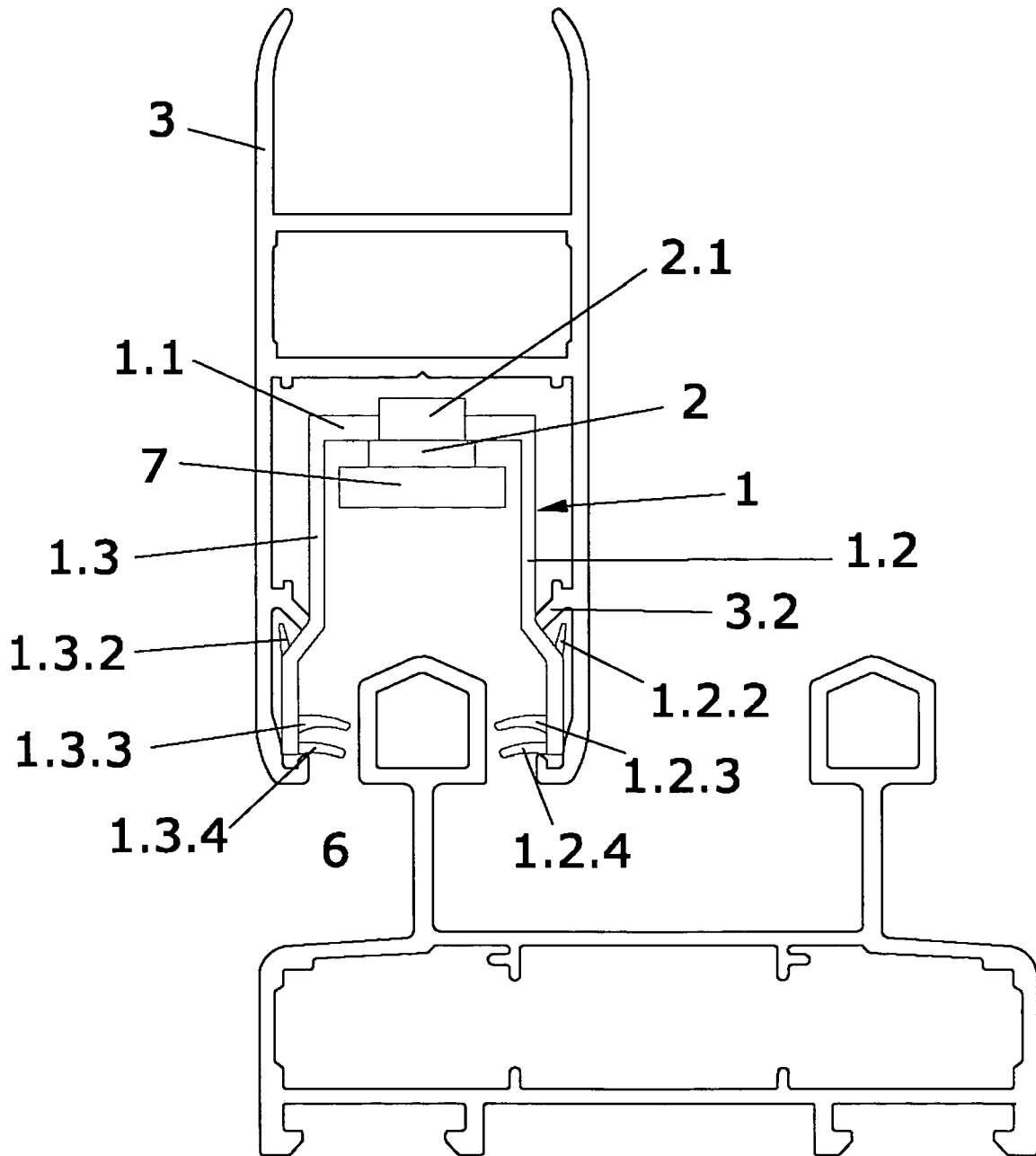


FIG.5

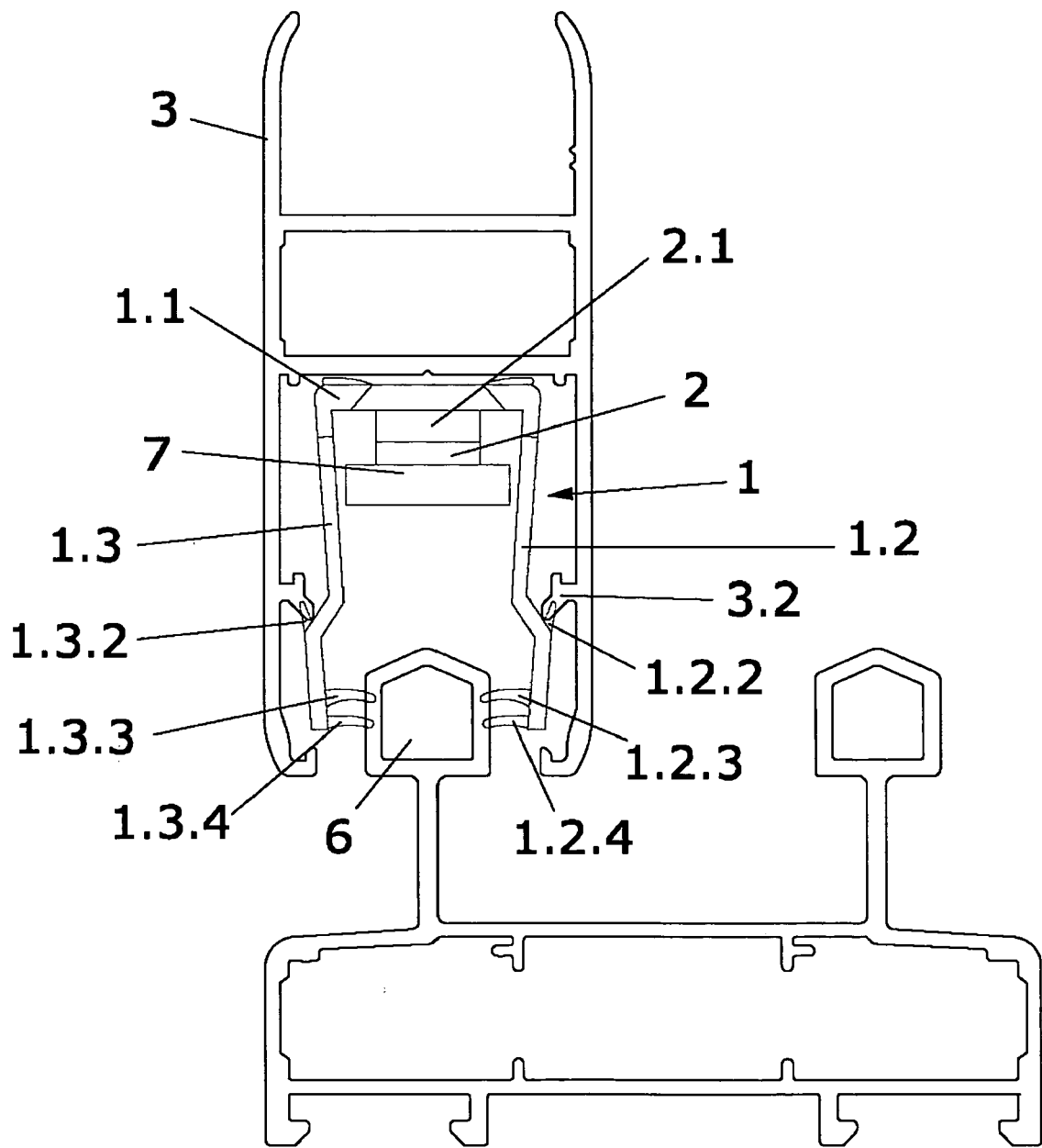


FIG.6

