(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 066 443 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
21.04.2004 Bulletin 2004/17

(21) Application number: **99914851.3**

(22) Date of filing: **23.03.1999**

(51) Int Cl.[7]: **E05F 3/00**, E05F 3/22

(86) International application number:
PCT/SE1999/000450

(87) International publication number:
WO 1999/049166 (30.09.1999 Gazette 1999/39)

(54) **DEVICE IN CONNECTION WITH MOUNTING OF A DOOR CLOSER**

VORRICHTUNG IN VERBINDUNG MIT DEM EINBAU EINES TÜRSCHLIESSERS

DISPOSITIF RELATIF AU MONTAGE D'UN FERME-PORTE

(84) Designated Contracting States:
AT BE DE DK ES FI FR GB IT NL

(30) Priority: **26.03.1998 SE 9801023**

(43) Date of publication of application:
10.01.2001 Bulletin 2001/02

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EP 1 066 443 B1

Printed by Jouve, 75001 PARIS (FR)

Description

Technical Field of the Invention

[0001] The present invention relates to a device in connection with mounting of a door closer, said door closer being intended to actuate a door leaf received in a frame.

Prior Art

[0002] A frequent problem in connection with mounting of conventional door closers is that the attachment that is mounted on the frame/dressing has a tendency to loosen. The reason therefore if that the height, at which said attachment is mounted, is given by the location of the closing mechanism itself on the door leaf. The closing mechanism must namely be located relatively close to the upper edge of the door leaf in order to achieve a proper attachment to the frame of the door leaf. Thereby, it is extremely usual that the fastening means/the screws of the attachment mounted on the frame/dressing are located in the area where the frame and dressing overlap each other, the fastening means/the screws are located exactly at the edge of the frame and splits said frame.

[0003] From US-A-2,960,718 a door closer is previously known where the actual closing mechanism is mounted on the door leaf, a first arm at one end being pivotally attached to said closing mechanism. At its other end said first arm is pivotally connected with one end of a second arm, the other end of said second arm being pivotally attached, via a mounting element, to the door frame. Said mounting element is L-shaped and has a longer part attached to the side of the door frame that faces the door leaf in closed position. The other arm is fastened to the shorter part of the mounting element. In order to avoid that the longer part of the mounting element interferes with the door leaf, when said door leaf is in closed position, said longer part must be recessed in the frame. Apart from being time consuming this is also a damage to the door frame.

[0004] From US-A-2,122,162 and EP-A1-0 484 535 door closers are previously known where the mounting elements of one end of one arm of the door closer are fastened to the part of the frame that faces the door leaf when said door leaf is in closed position. Thereby, the same disadvantages arise as regards mounting and damage as has been pointed out above.

Objects and Features of the Invention

[0005] A primary object of the present invention is to provide a device of the type mentioned above, said device resulting in that the attachment of one arm of the door closer to the frame has extremely high strength.

[0006] A further object of the device according to the present invention is that it should be extremely simple to mount without any damage worth to mention on the door frame and the dressing.

[0007] Still an object of the device according to the present invention is that it is manufactured in dimensions that are adapted to the dimensions of connecting structural parts.

[0008] At least the primary object of the invention is realised by means of a mounting element that have been given the features of the appended independent claims. Preferred embodiments of the mounting element according to the invention are defined in the dependent claims.

Brief Description of the Drawings

[0009] Below embodiments of the device according to the invention will be described, reference being made to the accompanying drawings where the figures show:

- Figure 1 shows a perspective view of an embodiment of a device according to the present invention;
- Figure 2 shows a perspective view from the diametrically opposite direction of the device according to figure 1;
- Figure 3 shows a perspective view of an alternative embodiment of a device according to the present invention;
- Figure 4 shows a perspective view from the diametrically opposite direction of the device according to figure 3;
- Figure 5 shows a schematic, partly sectioned, side view of a door closer that is mounted by means of a device according to the present invention; and
- Figure 6 shows a front view of a device according to the present invention in mounted position.

Detailed Description of Preferred Embodiments

[0010] The first embodiment of a device according to the present invention, shown in figures 1 and 2, constitutes a mounting element 1 that comprises a web 3 and two flanges 5 and 7 respectively, said flanges 5 and 7 respectively projecting from said web 3 and being designated the first flange 5 and the second flange 7. Each plane of the first and second flanges 5 and 7 respectively has an extension substantially perpendicular to the plane of the web 3. The planes of the first and second flanges 5 and 7 are essentially parallel to each other. Generally it can be said that the mounting element 1 has the shape of a Z, i.e. the flanges 5, 7 project from the longitudinal, opposite edges of the web 3, said flanges 5, 7 having an extension in opposite direction compared to each other.

[0011] As is evident from figures 1 and 2 two internally threaded, through-going holes 9 are provided in the first flange 5, said holes 9 being located in the area of the

longitudinal end portions of the first flange 5. Between said internally threaded holes 9, preferably midway between, a first, through-going, countersunk (see figure 2) hole 10 is provided, preferably said hole 10 is not internally threaded. In the second flange 7 two second, through-going, countersunk (see figure 2) holes 11 are provided, said holes 11 being located in the area of the longitudinal end portions of the second flange 7. Preferably, said second holes 11 are not internally threaded.

[0012] The second embodiment, shown in figures 3 and 4, of a device according to the present invention constitutes a mounting element 1' that likewise comprises a web 3' and first and second flanges 5 and 7 respectively projecting from the web 3', the planes of the flanges 5, 7, in a corresponding way as in the embodiment according to figures 1 and 2, having an extension substantially perpendicular to the plane of the web 3' and that the planes of the flanges 5, 7 are substantially parallel to each other. The principle difference between the mounting element 1 and the mounting element 1' is that the last mentioned has a relatively seen larger web height, the importance of this will be illuminated below in connection with figure 5.

[0013] The use of the mounting element 1 according to the present invention is shown schematically in figure 5. A frame 12 is mounted in an opening in a wall 13, said frame 12 in a known way being wedged relative to stud 14, i.e. an interspace 15 is created between the frame 12 and the stud 14. A building board 16, said building board 16 being provided on the right side of the stud 14 in figure 5, terminates on a level with the stud 14, i.e. the interspace 15 reaches also between the frame 12 and the building board 16. In order to cover the interspace 15 a dressing 17 is provided in a known way, said dressing 17 having one longitudinal edge abutting the frame 12 and the other longitudinal edge abutting the building board 16 and the stud 14 located inside of the building board 16. A door leaf 18 is received in the frame 12 in a known way.

[0014] As if evident from figures 5 and 6 a mounting element 1 according to the present invention is mounted on the frame 12 in such a way that the second flange 7 abuts the frame 12 and is fastened to said frame 12 by having two first wood screws 19, see figure 6, received in said second through-going, countersunk holes 11, the threaded parts of the wood screws 19 being fastened in the frame 12. By having said first wood screws 19 fastened in massive wood in the frame 12 the mounting element 1 is extremely safely fastened to the frame 12. In order to further stabilise the fastening of the mounting element 1 to the frame 12 a second wood screw 20 may be provided in the first through-going, countersunk hole 10 in the first flange 5, said wood screw 20 having its threaded part fastened in the dressing 17. Said second wood screw 20 has not any direct load carrying function but has in principle only a stabilizing effect. As is most evident from figure 5 the web height of the mounting element 1 corresponds in principle to the thickness of the dressing 17. In the ideal case an abutment of the first flange 5 against the dressing 17 will take place when the mounting element 1 is fastened to the frame 12. Thereby, the provision of said second wood screw 20 may to some extent emphasise this abutment. In this connection it should be pointed out that the mounting element 1' according to figures 3 and 4 is adapted for a dressing having a lager thickness than the dressing 17.

[0015] A door closer 21 of conventional design is mounted on the door structure according to figure 5, the closing mechanism 22 itself being mounted on the door leaf 18. A first arm 23 has one end pivotally attached to the closing mechanism while the other end of said first arm 23 is pivotally connected with one end of a second arm 24, the other end of said second arm 24 being pivotally attached, via an attachment 25, to the mounting element 1 according to the present invention. The attachment 25 is fastened to the first flange 5 by means of suitable, threaded screws, not shown, that extends through holes provided in the part of the attachment 25 that the contacts the first flange 5. Said screws, not shown, are fastened in the threaded holes 9 of the first flange 5. Thereby, the attachment 25 is properly attached to the mounting element 1 via its first flange 5.

Feasible Modifications of the Invention

[0016] The disclosed relations, according to the above embodiments, between the surfaces of the flanges 5, 7, should only be regarded as preferred embodiments within the scope of the invention. Said relations may of course be varied as long as the function of the invention is not endangered. An aspect to consider in this connection is that the diameters of the holes 9-11 must be in reasonable proportion to the surfaces of the flanges 5, 7, i.e. there must exist surrounding material around the holes to such an extent that the strength of the mounting element 1; 1' is not endangered in the application in question. The material thickness of the flanges 5, 7, in relation to its surfaces, is of course also of importance for the strength of the mounting element 1; 1'. Generally it can be said that the dimensions of the parts of the mounting elements 1; 1' may be varied in several ways for adaption to different applications.

[0017] In connection with the description of the preferred embodiments above it is stated that the holes 10 and the 11 should be countersunk and being void of an internal thread. The reason therefore is of course that said holes 10, 11 are intended to receive wood screws. However, within the scope of the invention, it is feasible that these holes are void of a countersink, e.g. in order to decrease manufacturing costs. These holes 10, 11 may of course also have an internal thread, said thread however normally has no function. The number of second holes 11 in the second flange is according to the invention not restricted to the number of two but a different number of holes 11 are feasible within the scope of the invention, also only one second hole 11 is feasible

during certain conditions.

[0018] In the preferred embodiments described above the first flange 5 is provided with two through-going, internally threaded holes 9. This seems to be the most suitable design. However, the invention is in no way restricted to two through-going, internally threaded holes 9 in the first flange 5, but within the scope of the invention it is also feasible that the flange 5 has a different number of threaded holes, also only one threaded hole may be feasible during certain conditions.

[0019] To have the holes 9 of the first flange 5 internally threaded seems to be the most preferred embodiment since said embodiment allows a simple fastening of the attachment to said first flange 5. However, within the scope of the invention it is also feasible that the holes of the first flange 5 are not internally threaded but the fastening of the attachment 25 to the first flange 5 is effected by means of bolt and nut. In such case it must be guaranteed that there is space for the nut between the dressing 17 and the first flange 5. This is solved by using a mounting element according to the invention, said mounting element having a web height that is larger than the thickness of the dressing 17.

[0020] Within the scope of the invention it is also feasible to connect the attachment 25 with the first flange 5 by means of other connecting means that some type of thread connection. In exemplifying and non-restricting purpose it may be stated connecting means in the shape of an adhesive binder that is applied between the contacting surfaces of the attachment 25 and the first flange 5. In this connection it is feasible, in certain cases, to exclude the through-going holes in the attachment 25 and the first flange 5.

[0021] As regards the fastening of the second flange 7 to the frame 12 wood screws seems to be the most suitable fastening means. However, the invention is not restricted to wood screws but every fastening of the second flange 7 to the frame that results in a proper fastening of said second flange is feasible within the scope of the invention.

[0022] The material of the mounting element according to the present invention is preferably light metal, however within the scope of the invention other alternative materials are feasible, in exemplifying and non-restricting purpose an injection moulded plastic material may be mentioned.

[0023] In the embodiments described above the mounting element 1; 1' is used in connection with mounting of a type of door closer that includes a hinged arm structure having a first arm 23 and a second arm 24. The mounting element 1; 1' according to the present invention is in no way restricted to be used only in connection with this type of door closer but said mounting element 1; 1' may be used also in connection with other types of door closers. In exemplifying and non-restricting purpose a door closer may be mentioned that has a structure including a sliding rail where in such a case the sliding rail normally is supported, via an intermediate mounting plate, by two mounting elements 1; 1' according to the present invention. The expression "attachment" in the claims should be given an extensive interpretation, said "attachment" may also constitute certain means and accessories that are necessary for the connection of the door closer with one or several mounting elements 1; 1' according to the present invention.

Claims

1. Device (1; 1') in connection with mounting of a door closer (21), said door closer (21) being intended to actuate a door leaf (18) received in a frame (12), **characterized in that** it constitutes a mounting element (1; 1'), said mounting element (1; 1') in cross-section having generally the shape of a Z and including a first flange (5) that constitutes a mounting plate, an attachment (25) of the door closer being intended to be connected with said mounting plate (5), a web (3; 3') projecting from the first flange (5) and a second flange (7) projecting from said web (3; 3'), that the planes of the flanges (5, 7) are essentially perpendicular to the plane of the web (3; 3'), and that the second flange (7) has means (11) for fastening said second flange (7) in the frame (12).

2. Device (1; 1') according to claim 1, **characterized in that** said first and second flanges (5, 7) are integral with the web (3; 3').

3. Device (1; 1') according to claims 1 or 2, **characterized in that** the second flange (7) has at least one through-going hole (11).

4. Device (1; 1') according to any of the claims 1-3, **characterized in that** the mounting plate/the first flange (5) has at least one through-going hole (9).

5. Device (1; 1') according to claim 4, **characterized in that** the through-going hole (9) in the mounting plate/the first flange (5) is internally threaded.

6. Device (1; 1') according to any of claims 1-3, **characterized in that** the mounting plate/the first flange (5) has two internally threaded, through-going holes (9) that are located in the area of the longitudinal end portions of the mounting plate/the first flange (5), and that a further, through-going hole (10) is provided between said internally threaded holes (9).

7. Device (1; 1') according to claims 1 or 2, **characterized in that** the second flange (7) has two through-going holes (11) that are located in the area of the longitudinal end portions of the second flange

(7).

Patentansprüche

1. Vorrichtung (1, 1') in Verbindung mit dem Einbau eines Türschließers (21), wobei dieser Türschließer dafür vorgesehen ist, ein in einem Rahmen (12) aufgenommenes Türblatt (18) zu betätigen,
dadurch gekennzeichnet, daß sie ein Befestigungselement (1, 1') bildet, wobei das Befestigungselement (1, 1') im Querschnitt hauptsächlich die Form eines Z hat und einen ersten Flansch (5), der eine Befestigungsplatte darstellt, eine Befestigung (25) für den Türschließer, die dafür vorgesehen ist, mit der Befestigungsplatte (5) verbunden zu werden, einen Steg (3, 3'), der von dem ersten Flansch (5) vorspringt, und einen zweiten Flansch (7), der von dem Steg (3, 3') vorspringt, beinhaltet, so daß die Ebenen der Flansche (5, 7) im wesentlichen senkrecht zu der Ebene des Stegs (3, 3') sind und daß der zweite Flansch (7) Mittel (11) zum Befestigen dieses zweiten Flansches (7) am Rahmen (12) aufweist.

2. Vorrichtung (1, 1') nach Anspruch 1, **dadurch gekennzeichnet, daß** der erste und der zweite Flansch (5, 7) mit dem Steg (3, 3') einstückig ausgebildet sind.

3. Vorrichtung (1, 1') nach einem der Ansprüche 1 oder 2, **dadurch gekennzeichnet, daß** der zweite Flansch (7) zumindest ein Durchgangsloch (11) aufweist.

4. Vorrichtung (1, 1') nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, daß** die zweite Befestigungsplatte/der erste Flansch (5) zumindest ein Durchgangsloch (9) aufweist.

5. Vorrichtung (1, 1') nach Anspruch 4, **dadurch gekennzeichnet, daß** das Durchgangsloch (9) in der Befestigungsplatte/dem ersten Flansch (5) mit einem Innengewinde versehen ist.

6. Vorrichtung (1, 1') nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, daß** die Befestigungsplatte/der erste Flansch (5) zwei mit Innengewinde versehene Durchgangslöcher (9) aufweist, die im Bereich der longitudinalen Endabschnitte der Befestigungsplatte/des ersten Flansches (5) angeordnet sind und daß ein weiteres Durchgangsloch (10) zwischen besagten, mit Innengewinde versehenen Löchern (9) vorgesehen ist.

7. Vorrichtung (1, 1') nach einem der Ansprüche 1 oder 2, **dadurch gekennzeichnet, daß** der zweite Flansch (7) zwei Durchgangslöcher (11) aufweist, die im Bereich der longitudinalen Endabschnite des zweiten Flansches (7) angeordnet sind.

Revendications

1. Dispositif (1 ; 1') se rapportant au montage d'un ferme-porte (21), ledit ferme-porte (21) étant destiné à actionner un battant (18) de porte reçu dans un dormant (12),
caractérisé en ce qu'il constitue un élément de montage (1 ; 1'), ledit élément de montage (1 ; 1') ayant, en section droite, la forme générale d'un Z et comportant un premier rebord (5) qui constitue une plaque de montage, une fixation (25) du ferme-porte étant destiné à être reliée avec ladite plaque de montage (5), un plat, ou lame centrale, (3 ; 3') faisant saillie du premier rebord (5) et un deuxième rebord (7) faisant saillie dudit plat (3, 3'),
en ce que les plans des rebords (5, 7) sont sensiblement perpendiculaires au plan du plat (3 ; 3'), et
en ce que le deuxième rebord (7) possède un moyen (11) servant à la fixation dudit deuxième rebord (7) sur le dormant (12).

2. Dispositif (1 ; 1') selon la revendication 1, **caractérisé en ce que** lesdits premier et deuxième rebords (5, 7) sont solidaires du plat (3 ; 3').

3. Dispositif (1 ; 1') selon la revendication 1 ou 2, **caractérisé en ce que** le deuxième rebord (7) possède au moins un trou traversant (11).

4. Dispositif (1 ; 1') selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** la plaque de montage/le premier rebord (5) possède au moins un trou traversant (9).

5. Dispositif (1 ; 1') selon la revendication 4, **caractérisé en ce que** le trou traversant (9) ménagé dans la plaque de montage/le premier rebord (5) est intérieurement fileté.

6. Dispositif (1 ; 1') selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** la plaque de montage/le premier rebord (5) possède deux trous traversants (9) intérieurement filetés qui sont placés dans l'aire des parties terminales longitudinales de la plaque de montage/du premier rebord (5), et **en ce qu'**un trou traversant (10) supplémentaire est ménagé entre lesdits trous intérieurement filetés (9).

7. Dispositif (1 ; 1') selon la revendication 1 ou 2, **caractérisé en ce que** le deuxième rebord (7) possède deux trous traversants (11) qui sont placés dans J'aire des parties terminales longitudinales du

deuxième rebord (7).

Fig 2

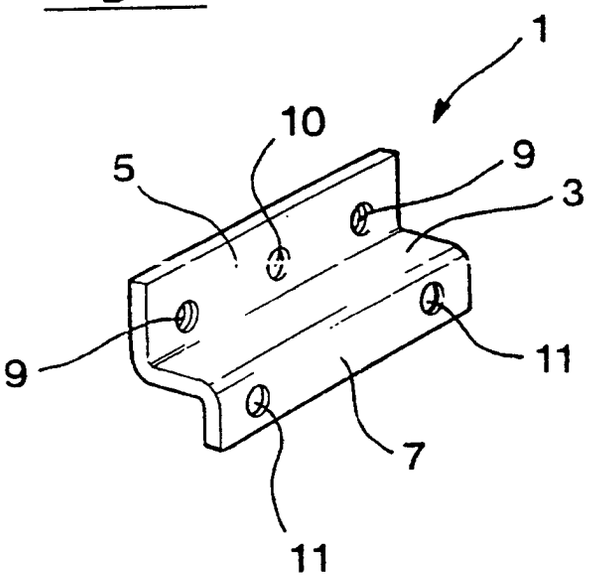

Fig 1

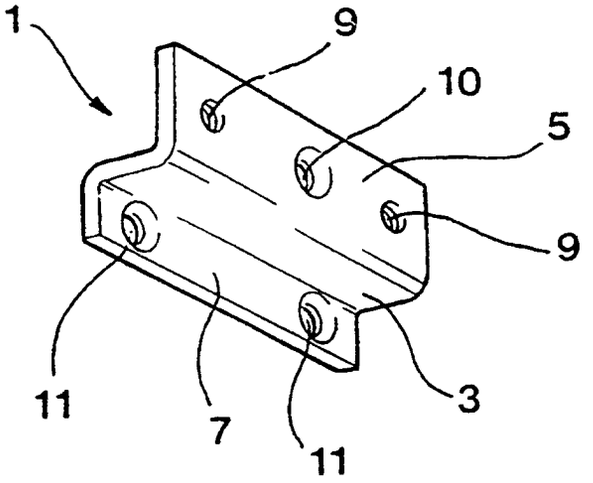

Fig 4

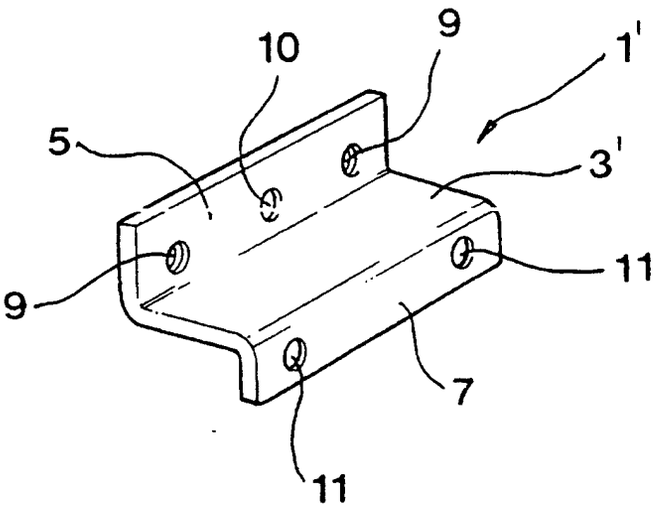

Fig 3

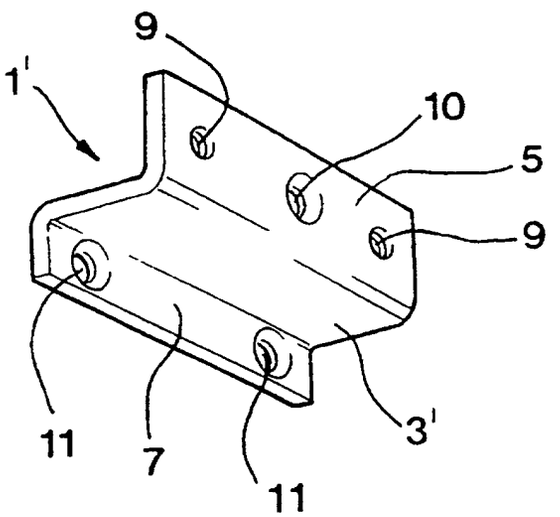

Fig 5

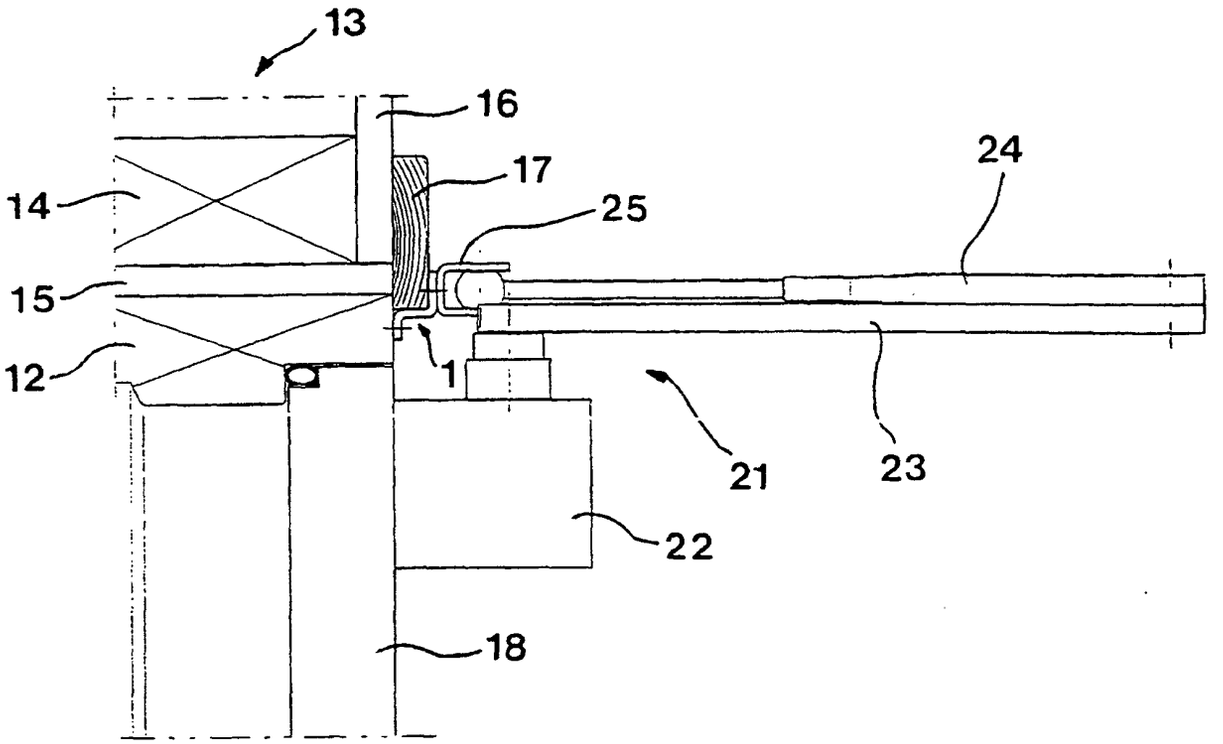

Fig 6