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(54) **An adjustable hinge for doors and windows**

Verstellbares Scharnier für Türen und Fenster

Charnière réglable pour portes et fenêtres

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EP 2 186 980 B1

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Description

[0001] This invention relates to an adjustable hinge for doors and windows, in particular doors and windows with frames made of metal, PVC or aluminium and wood.

[0002] The invention relates, in particular, to hinges of medium - to heavy-duty type, that is to say, strong enough to support door and window units of considerable weight.

[0003] Another important feature of these hinges is that they must permit precise adjustment so as to better adapt the position of the mobile frame of the door/window unit relative to the fixed frame after the unit has been assembled.

[0004] Structurally, these hinges normally consist of:

- two hinge bodies, usually of aluminium or aluminium alloy, attachable to the mobile and fixed frames of the door/window unit; and
- a steel hinge pin that can be inserted into respective through holes in the two hinge bodies with interposed centring bushes (usually made of self-lubricating plastic); at the centre of the hinge pin there is a collar, made as a single piece with the hinge pin itself, and larger in diameter than the through holes in the hinge bodies so as to prevent the pin from coming out of the holes in the hinge bodies (an example of a hinge for a heavy door unit is also described in patent IT-1.221.237 to the same Applicant as this invention).

[0005] Each hinge body comprises a cylindrical tubular portion, or socket, and portions or flaps for fastening to the door/window using any of several well-known kinds of fastening means, such as screws for fastening the hinge flaps to the frame members or plugs housed in suitable grooves to abut the flap portion of the hinge body through drive means (all these solutions being well known).

[0006] The bushes usually consist of a cylindrical element closed at one end and a collar located at the open end which rests against the outer cylindrical surface of the hinge body.

[0007] Starting from a hinge structure of this type, several solutions have been devised to permit the above mentioned adjustments of the mobile frame relative to the fixed frame so as to facilitate door/window assembly and achieve trouble-free door/window operation.

[0008] These adjustments, acting on the mobile frame, can be performed in three axes: a vertical axis (axis of rotation Z), an axis perpendicular to the vertical plane of the fixed frame (axis Y, and also known as "compression" in the jargon of the trade) and an axis parallel to the vertical plane of the door/window frame (axis X).

[0009] The adjustment in the axis X is performed (as described for example in patent EP 992.647 to this Applicant which discloses the features of the preamble of claim 1) using the bush located in the "female" portion of the hinge (that is, on the upper hinge body associated with the mobile frame).

[0010] This bush has an outer radial protrusion that engages in a matching notch made in the inside surface of the hole in the hinge body so as to form a pivot point that allows a pendular movement of the bush in both directions as one with the pin it accommodates, this pendular movement being produced by an adjustment device actuated from the outside of the hinge body.

[0011] The adjustments in the axes Z and Y, on the other hand, are usually performed at the lower (or "male") portion of the hinge body, that is to say, the portion nearest the ground or floor.

[0012] Although on the one hand these adjustments have greatly improved the operation and durability of the mobile part of the door/window unit, on the other hand, in particular the "lateral" adjustment in the axis parallel to the vertical plane of the door/window (axis X) always creates an offset between the two cylindrical portions or sockets of the hinges (since it involves physically moving the hinge body and the mobile frame) which may often be aesthetically unattractive.

[0013] This invention therefore has for an aim to overcome the above mentioned disadvantages by providing an adjustable hinge for doors and windows that is constructionally simple, while having all the technical adjustment features of prior art hinges and offering the possibility of making adjustments that allow the aesthetic quality of the hinge assembly to be maintained at a high standard, that is to say, reducing and/or eliminating the offset between the two cylindrical portions or sockets of the hinges.

[0014] Another aim of the invention is to provide an adjustable hinge structure suitable for different door/window styles and offering the possibility of maintaining, in particular, the optimum functionality and durability of the hinge assembly. According to this invention, the above aim is achieved by a hinge, in particular an adjustable hinge for doors and windows comprising the technical characteristics set out in one or more of the appended claims.

[0015] The technical features of the invention, with reference to the above aims, are clearly described in the claims below and its advantages are more apparent from the detailed description which follows, with reference to the accompanying drawings which illustrate a preferred non-limiting example embodiment of the invention, and in which:

- Figure 1 is a perspective exploded view of an adjustable hinge for doors and windows according to a preferred embodiment of the invention;
- Figure 2 is a perspective exploded view of a second embodiment of the adjustable hinge for doors and windows;
- Figure 3 is a perspective view of the hinge of Figure 1 in an assembled configuration;
- Figure 4 is a perspective view of a detail of the hinge of Figure 1, showing in particular a bush or cartridge and a hinge pin;

- Figures 5, 6 and 7 are all top plan views, with some parts cut away and others in cross section to better illustrate certain details, showing the hinge of Figure 1 mounted on a door/window and

[0016] respectively in three different positions that can be adopted by the mobile frame along an axis parallel to the plane of the door/window; - Figures 8, 9 and 10 are all top plan views, with some parts cut away and others in cross section to better illustrate certain details, showing the hinge of Figure 2 mounted on a door/window and respectively in three different positions that can be adopted by the mobile frame along an axis parallel to the plane of the door/window.

[0017] With reference to the accompanying drawings, in particular Figures 1 to 3, the adjustable hinge according to the invention is used preferably but not exclusively for doors and windows 6 of medium to heavy type (that is to say, exterior doors, doors or windows separating communicating rooms, etc.).

[0018] This hinge, denoted in its entirety by the numeral 1, basically comprises: a first hinge body 2 and a second hinge body 3 having respective outside portions 2a, 3a for engaging a hinge pin 4 defining a vertical rotation axis Z for a mobile frame 5 of the door/window 6.

[0019] Each of the hinge bodies 2 and 3 also has a respective portion 2b, 3b or flap for fastening to the mobile frame 5 and to a fixed frame 7 of the door/window 6, respectively.

[0020] The flap may have any of several different forms, depending on the hinge style, whether for medium or heavy duty, face-mounted or groove-mounted, etc. without thereby limiting the scope of the inventive concept as defined by the claims.

[0021] Means are also provided for adjusting the mobile frame 5 relative to the fixed frame 7 along an axis X parallel to the vertical plane of the door/window 6, these means being positioned and operative on the hinge body, labelled 2, associated with the mobile frame 5.

[0022] These adjustment means are described in more detail below.

[0023] Looking more closely at the details, still with reference to Figures 1, 2 and 3, the outside portion 2a of the hinge body 2 associated with the mobile frame 5 is divided into:

- an appendage 9 integral with, and projecting from, the portion 2b or flap to be fastened to the door/window 6;
- a tubular bushing or cartridge 10 at least partly encompassing the appendage 9 and stably associated with the hinge pin 4 at one end of it;
- a cartridge 10 pivoting pin 11 having an axis Z11 parallel to the rotation axis Z and housed in respective coaxial holes 12, 13 in the cartridge 10 and in the appendage 9.

[0024] In addition to the above, means 8 are provided

between the cartridge 10 and the appendage 9 and act between the same (thereby constituting a part of the above mentioned adjustment means) in such a way as to move the mobile frame 5 in both directions along the axis X parallel to the vertical plane of the door/window 6: this adjustment movement does not affect the cartridge 10 (in the translational sense) which continues to coincide axially with the respective cylindrical portion 3a of the other hinge body 3 thanks to the rotation of the cartridge 10 about the axis Z11 of the pivot pin 11.

[0025] In other terms, the cartridge 10, as will become clearer as this description continues, forms part of the above mentioned adjustment means, acting as an abutment for adjusting the hinge body 2 along the axis X (being integral with the hinge pin 4) while, however, continuing to coincide with the tubular part of the other hinge body 3 thanks to its shape and the fact that it is pivotally mounted by the pivoting pin 11.

[0026] Looking more closely at the constructional details, with reference also to Figures 4 to 10, the appendage 9 is composed of: a first part 9a, with the cylindrical hole 13 for housing the pivoting pin 11, close to the zone adjoining the portion or flap 2b, and a second part 9b defining an uninterrupted extension of the first part 9a and tapering towards the free end.

[0027] The cartridge 10 (see Figure 4 in particular) is made of metallic material and has a first, closed end provided with a first, central hole 14 for stably engaging the hinge pin 4, and the above mentioned second hole 12, offset relative to the first hole 14 and designed to house a portion of the pivoting pin 11.

[0028] In turn, the hinge pin 4 cylindrical portion 4a associated with the cartridge 10 has a rough outside surface designed to allow the pin 4 to be made integral with the cartridge 10: that way, the movement of the hinge body 2 and of the mobile frame 5 along the axis X is isolated from the hinge pin 4 by the cartridge 10.

[0029] Still with reference to Figures 4 to 10, the cartridge 10 is open lengthways to form a C section in such a way that, in use, the free ends of the C section are near the projecting appendage 9 to surround the appendage 9 on two sides.

[0030] The spacing D between the two opposite free ends of the cartridge 10 is greater than the thickness S of the appendage 9: that means the cartridge 10 can rotate about the axis Z11 during adjustment in the axis X (see Figures 5 and 8).

[0031] The cartridge 10 also has a cap 15 for closing its second, free end (see Figures 1 and 2). The cap 15 is provided with a slot 16 for accommodating the top end of the pivoting pin 11 protruding from the cylindrical holes 13 made in the appendage 9.

[0032] In a first embodiment illustrated in Figures 1 and from 5 to 7, the drive means 8 comprise a grub screw 17 screwed into a hole 18 passing transversally through the second, extension part 9b of the appendage 9.

[0033] The grub screw 17 is in contact with, and bilaterally abuts, the inside cylindrical surface of the cartridge

10.

[0034] The cartridge 10 in turn has a through slot 19 designed to enable the grub screw 17 to be driven from the outside (using a suitable tool), in such a way as to obtain a movement of the mobile frame 5 along the axis X parallel to the vertical plane of the door/window 6 by pushing the inside abutting surface of the cartridge 10 in both directions in such a way as to shift the appendage 9 and the flap 2b of the hinge body 2, together with the mobile frame 5 (see arrows F5) and simultaneously rotate the cartridge 10 about the rotation axis Z11 of the pivoting pin 11 (see arrows F10).

[0035] In other words, screwing or unscrewing the grub screw 17 in the hole 18 causes a translational movement of the appendage 9 and flap 2b, since the grub screw 17 is in contact with the cartridge 10 on two sides. This movement creates a pushing action on the cartridge 10 which is thus forced to turn thanks to the constraint provided by the pivoting pin 11 (being unable to move translationally in that it is integral with the hinge pin 4), thereby contributing to the translational movement of the appendage 9 (see three different distances X1, X2 and X3 in Figures 5, 6 and 7): that way, the cartridge 10 remains at all times coaxial with the rotation axis Z of the door/window and thus also with the cylindrical portion 3b of the other hinge body 3.

[0036] In view of the presence of a through slot on it, the cartridge 10 may be covered by a cylindrical covering element 50 fitted round the cartridge 10 itself.

[0037] Figures 2 and 8 to 10 illustrate a second embodiment of the adjustment means 8.

[0038] In this embodiment, the adjustment means 8 comprise a rotatable half-bush 20 internally interposed between the cartridge 10 and the free end of the appendage 9 which has a cylindrical enlarged portion 21.

[0039] The half-bush 20 has a V-shaped section whose vertex engages the enlarged end portion 21 of the appendage 9 to define a further pivot for rotating the half-bush 20 and pushing the appendage 9.

[0040] The half-bush 20 has a front surface 20a for contact with an inside surface of the cartridge 10. The front surface 20a is provided with teeth 22 that mesh with matching grooves 23 in the cartridge 10. The grooves 23 are greater in number than the teeth 22 in such a way as to permit the stepwise adjustment along the axis X by moving the half-bush 20 and stably engaging the grooves 23.

[0041] In this embodiment, therefore, adjustment is accomplished in steps in both directions (see distances X4, X5 and X6 in Figures 8 to 10) by inserting a key from the outside into sockets made in the half-bush 20 and forcing the half-bush to turn (arrows F5) so that it disengages from the initial grooves 23 and snaps into the grooves 23 before or after them on the cartridge 10, and turns around the end 21 of the appendage 9.

[0042] The movement of the half-bush 20 creates a thrusting action on the appendage 9 that adjusts the cartridge 10 by turning it (see arrows F10) so that it adapts

to and remains coaxial with the axis Z by turning about the axis Z11 of the pivoting pin 11, which is moved translationally with the appendage 9.

[0043] In short, in both cases, the rotation of the cartridge 10 always adjusts to the translation of the hinge body 2 (comprised of appendage 9 and flap 2b), but keeping the cartridge 10 itself coaxial with the cylindrical portion 3b of the other hinge body 3.

[0044] A hinge made as described above fully achieves the above mentioned aims thanks to the subdivision of the components of the cylindrical part of one of the hinge bodies into a projecting appendage and a cylindrical cartridge pivoted to a pin parallel to the axis of rotation.

[0045] These three components, namely cartridge, appendage and pin, together with the means for their relative motion make it possible to obtain adjustment along the axis X but without offsetting the cartridge relative to the cylindrical portion of the other hinge body, thus improving the aesthetic quality of the hinge as a whole.

[0046] The adjustment is maintained at traditional levels of precision and is easy for door/window installers to implement.

[0047] Moreover, the structuring of the hinge is such as to permit extreme adaptability of the solution provided by the invention to several different types of hinges, since the part used for fastening to the door/window frames can be of any type without altering the constructional architecture of the cylindrical portion.

[0048] The invention described above is susceptible of industrial application and may be modified and adapted in several ways without thereby departing from the scope of the inventive concept as defined by the claims. Moreover, all the details of the invention may be substituted by technically equivalent elements.

Claims

1. An adjustable hinge for doors and windows, the hinge (1) being of the type comprising at least: a first hinge body (2) and a second hinge body (3) having respective outside portions (2a, 3a) for engaging a hinge pin (4) defining a vertical rotation axis (Z) for a mobile frame (5) of the door/window (6); each first and second hinge body (2, 3) having a respective portion (2b, 3b) or flap for fastening, respectively, to the mobile frame (5) and to a fixed frame (7) of the door/window (6); means for adjusting the mobile frame (5) relative to the fixed frame (7) along a horizontal axis (X) parallel to the vertical plane of the door/window (6) being positioned and operative on the hinge body (2) associated with the mobile frame (5), the hinge (1) being **characterized in that** the outside portion (2a) of one of the hinge bodies (2) is divided into:

- an appendage (9) integral with, and projecting

- from, the portion (2b) or flap to be fastened to the door/window (6);
- a tubular bushing or cartridge (10) at least partly encompassing the appendage (9) and stably associated with the hinge pin (4) at one end of it;
 - a cartridge pivoting pin (11) having an axis (Z11) parallel to the rotation axis (Z) and housed in respective coaxial holes (12, 13) in the cartridge (10) and in the appendage (9);
 - drive means (17, 20) being operatively located between the cartridge (10) and the appendage (9) in order to move the mobile frame (5) in both directions along the axis (X) parallel to the vertical plane of the door/window (6) by rotating the cartridge (10) about the pivoting axis (Z11) while keeping the cartridge (10) and the respective outside portion (3a) of the other of the two hinge bodies (3) coaxially coincident.
2. The hinge according to claim 1, **characterized in that** the projecting appendage (9) is composed of a first part (9a), with the cylindrical hole (13) for housing the pivoting pin (11), close to the zone adjoining the portion or flap (2b), and a second part (9b) defining an uninterrupted extension of the first part (9a) and tapering towards the free end.
 3. The hinge according to claim 1, **characterized in that** the cartridge (10) has a first, closed end provided with a first, central hole (14) for stably engaging the hinge pin (4), and a second hole (12), offset relative to the first hole (14) and designed to house a portion of the pivoting pin (11).
 4. The hinge according to claim 1, **characterized in that** the cartridge (10) is open lengthways to form a C section in such a way that, in use, the free ends of the C section are near the projecting appendage (9); the spacing (D) between the two opposite free ends being greater than the thickness (S) of the projecting appendage (9).
 5. The hinge according to claim 3, **characterized in that** the cartridge (10) is equipped with a cap (15) for closing its second, free end; said cap (15) being provided with a slot (16) for accommodating the top end of the pivoting pin (11) protruding from one of the cylindrical holes (13) made in the appendage (9) projecting from the hinge body (2).
 6. The hinge according to claim 1, **characterized in that** the drive means (8) comprise a grub screw (17) screwed into a hole (18) passing transversally through the second, extension part (9b) of the projecting appendage (9); said grub screw (17) being in contact with, and bilaterally abutting, the inside cylindrical surface of the cartridge (10).
 7. The hinge according to claim 6, **characterized in that** the cartridge (10) has a through slot (19) designed to enable the grub screw (17) to be driven from the outside, in such a way as to obtain a movement of the mobile frame (5) along the axis (X) parallel to the vertical plane of the door/window (6) by pushing the inside abutting surface of the cartridge (10) in both directions in such a way as to shift the projecting appendage (9) and the flap (2b) of the hinge body (2), together with the mobile frame (5) and to rotate the cartridge (10) about the rotation axis (Z11) defined by the pivoting pin (11).
 8. The hinge according to claim 7, **characterized in that** the cartridge (10) can have a cylindrical covering element (50), or cap, fitted round it.
 9. The hinge according to claim 3, **characterized in that** the hinge pin (4) cylindrical portion (4a) associated with the cartridge (10) has a rough outside surface designed to allow the pin (4) to be made integral with the cartridge (10).
 10. The hinge according to claim 1, **characterized in that** the drive means (8) comprise a rotatable half-bush (20) internally interposed between the cartridge (10) and the free end of the projecting appendage (9) which has a cylindrical enlarged portion (21); the half-bush (20) having a V-shaped section whose vertex engages the enlarged end portion (21) of the projecting appendage (9) to define a further pivot for rotating the half-bush (20) and pushing the projecting appendage (9).
 11. The hinge according to claim 10, **characterized in that** the half-bush (20) has a front surface (20a) for contact with an inside surface of the cartridge (10); said front surface (20a) being provided with teeth (22) that mesh with matching grooves (23) in the cartridge (10) in such a way as to permit the stepwise adjustment through an engaging/disengaging action created by forcing the half-bush (20) to turn around the end (21) of the projecting appendage (9) in order to produce a thrusting action for adjusting the projecting appendage (9) and bringing the cartridge (10) into alignment.
 12. The hinge according to claim 1, **characterized in that** the cartridge (10) is made of a metallic material.

Patentansprüche

1. Verstellbares Scharnier für Türen und Fenster, wobei das Scharnier (1) von dem Typ ist, der mindestens Folgendes beinhaltet: einen ersten Scharnierkörper (2) und einen zweiten Scharnierkörper (3), die jeweilige Außenabschnitte (2a, 3a) aufweisen,

die für den Eingriff mit einem Scharnierzapfen (4) bestimmt sind, der eine vertikale Drehachse (Z) für einen beweglichen Rahmen (5) der Tür / des Fensters (6) bildet; worin jeder erste und zweite Scharnierkörper (2, 3) einen entsprechenden Abschnitt (2b, 3b) oder Lappen für die jeweilige Befestigung an dem beweglichen Rahmen (5) und an einem feststehenden Rahmen (7) der Tür / des Fensters (6) aufweist; Mittel zum Einstellen des beweglichen Rahmens (5) relativ zu dem feststehenden Rahmen (7) entlang einer parallel zu der vertikalen Ebene der Tür / des Fensters (6) verlaufenden horizontalen Achse (X), die auf dem mit dem beweglichen Rahmen (5) verbundenen Scharnierkörper (2) angeordnet und wirksam sind, wobei das Scharnier (1) **dadurch gekennzeichnet ist, dass** der Außenabschnitt (2a) eines der Scharnierkörper (2) unterteilt ist in:

- einen Anhang (9), der einteilig mit dem Abschnitt (2b) oder Lappen zur Befestigung an der Tür / dem Fenster (6) ausgeführt ist und von diesem hervorsteht;
- eine rohrförmige Buchse oder Hülse (10), die zumindest teilweise den Anhang (9) umgibt und an einem ihrer Enden fest mit dem Scharnierzapfen (4) verbunden ist;
- einen Hülsenschwenkzapfen (11) mit einer Achse (Z11), die parallel zur Drehachse (Z) verläuft und der in entsprechenden coaxialen Öffnungen (12, 13) in der Hülse (10) und im Anhang (9) untergebracht ist;
- Antriebsmittel (17, 20), die wirkend zwischen der Hülse (10) und dem Anhang (9) angeordnet sind, um den beweglichen Rahmen (5) in beiden Richtungen entlang der Achse (X) parallel zu der vertikalen Ebene der Tür / des Fensters (6) zu bewegen, indem die Hülse (10) um die Drehachse (Z11) geschwenkt wird, während die Hülse (10) und der entsprechende Außenabschnitt (3a) des anderen der beiden Scharnierkörper (3) coaxial übereinstimmend gehalten werden.

2. Scharnier nach Anspruch 1, **dadurch gekennzeichnet, dass** der hervorstehende Anhang (9) aus einem ersten Teil (9a) mit einer zylindrischen Öffnung (13) zur Aufnahme des Schwenkzapfens (11) nahe des an den Abschnitt oder Lappen (2b) angrenzenden Bereichs besteht, und aus einem zweiten Teil (9b), der eine durchgehende Verlängerung des ersten Teils (9a) bildet und sich zu seinem freien Ende hin verjüngt.
3. Scharnier nach Anspruch 1, **dadurch gekennzeichnet, dass** die Hülse (10) ein erstes, geschlossenes Ende aufweist, das mit einer ersten, mittigen Öffnung (14) für den stabilen Eingriff mit dem Scharnierzapfen (4) versehen ist, und mit einer zweiten

Öffnung (12), die relativ zu der ersten Öffnung (14) versetzt ist und dazu dient, einen Abschnitt des Schwenkzapfens (11) aufzunehmen.

4. Scharnier nach Anspruch 1, **dadurch gekennzeichnet, dass** die Hülse (10) in Längsrichtung geöffnet ist, um ein C-Profil zu bilden, so dass sich im Gebrauch die freien Enden des C-Profils nahe des hervorstehenden Anhangs (9) befinden; wobei der Abstand (D) zwischen den zwei gegenüberliegenden freien Enden größer ist als die Dicke (S) des hervorstehenden Anhangs (9).
5. Scharnier nach Anspruch 3, **dadurch gekennzeichnet, dass** die Hülse (10) mit einer Kappe (15) zum Verschluss ihres zweiten, freien Endes ausgestattet ist; wobei diese Kappe (15) einen Schlitz (16) für die Aufnahme des oberen Endes des Schwenkzapfens (11) aufweist, der von einer der zylindrischen Öffnungen (13) herausragt, die in dem vom Scharnierkörper (2) hervorstehenden Anhang (9) ausgebildet sind.
6. Scharnier nach Anspruch 1, **dadurch gekennzeichnet, dass** die Antriebsmittel (8) einen Gewindestift (17) beinhalten, der in eine Öffnung (18) eingeschraubt ist, die sich quer durch dem zweiten, verlängernden Teil (9b) des hervorstehenden Anhangs (9) erstreckt; wobei dieser Gewindestift (17) beidseitig berührend in Kontakt mit der inneren zylindrischen Oberfläche der Hülse (10) ist.
7. Scharnier nach Anspruch 6, **dadurch gekennzeichnet, dass** die Hülse (10) einen durchgehenden Schlitz (19) aufweist, der dazu dient, die Betätigung des Gewindestiftes (17) von außen zu ermöglichen, um eine Bewegung des beweglichen Rahmens (5) entlang der Achse (X) parallel zu der vertikalen Ebene der Tür / des Fensters (6) zu erhalten, indem eine Schubkraft auf die innere Anschlagfläche der Hülse (10) in beiden Richtungen ausgeübt wird, um den hervorstehenden Anhang (9) und den Lappen (2b) des Scharnierkörpers (2) zusammen mit dem beweglichen Rahmen (5) zu verschieben und die Hülse (10) um die von dem Schwenkzapfen (11) definierte Drehachse (Z11) zu schwenken.
8. Scharnier nach Anspruch 7, **dadurch gekennzeichnet, dass** die Hülse (10) ein zylinderförmiges Abdeckelement (50) oder eine Kappe aufweisen kann, die sie umgibt.
9. Scharnier nach Anspruch 3, **dadurch gekennzeichnet, dass** der zylindrische Abschnitt (4a) des Scharnierzapfens (4), der mit der Hülse (10) verbunden ist, eine raue Außenoberfläche aufweist, die dazu dient, die feste Verbindung des Zapfens (4) mit der Hülse (10) zu ermöglichen.

10. Scharnier nach Anspruch 1, **dadurch gekennzeichnet, dass** die Antriebsmittel (8) eine drehbare Halbbuchse (20) beinhalten, die intern zwischen der Hülse (10) und dem freien Ende des hervorstehenden Anhangs (9) angeordnet ist und die einen zylindrischen verbreiterten Abschnitt (21) aufweist; wobei die Halbbuchse (20) einen V-förmigen Abschnitt aufweist, dessen Spitze in den verbreiterten Endabschnitt (21) des hervorstehenden Anhangs (9) eingreift, um einen weiteren Schwenkpunkt für die Drehung der Halbbuchse (20) und die Verschiebung des hervorstehenden Anhangs (9) zu bilden.

11. Scharnier nach Anspruch 10, **dadurch gekennzeichnet, dass** die Halbbuchse (20) eine vordere Oberfläche (20a) für die Berührung mit einer inneren Oberfläche der Hülse (10) aufweist; wobei diese vordere Oberfläche (20a) mit Zähnen (22) versehen ist, die in entsprechende Rillen (23) in der Hülse (10) derart eingreifen, dass die schrittweise Einstellung durch eine Einrück-/Ausrückwirkung ermöglicht wird, die dadurch erzeugt wird, dass die Halbbuchse (20) gezwungen wird, eine Drehung um das Ende (21) des hervorstehenden Anhangs (9) auszuführen, um eine Schubwirkung zur Einstellung des hervorstehenden Anhangs (9) und zur Ausrichtung der Hülse (10) zu erzeugen.

12. Scharnier nach Anspruch 1, **dadurch gekennzeichnet, dass** die Hülse (10) aus metallischem Material hergestellt ist.

Revendications

1. Une charnière réglable pour portes et fenêtres, la charnière (1) étant du type comprenant au moins : un premier corps de charnière (2) et un deuxième corps de charnière (3) ayant des parties extérieures (2a, 3a) respectives destinées à venir en prise avec une broche d'articulation (4) définissant un axe de rotation (Z) vertical pour un ouvrant (5) de la porte ou fenêtre (6) ; chaque premier et deuxième corps de charnière (2, 3) ayant une partie (2b, 3b) respective, ou patte, pour la fixation, respectivement, à l'ouvrant (5) et à un dormant (7) de la porte ou fenêtre (6) ; des moyens de réglage de l'ouvrant (5) par rapport au dormant (7) le long d'un axe (X) horizontal parallèle au plan vertical de la porte ou fenêtre (6) étant positionnés et agissant sur le corps de charnière (2) associé à l'ouvrant (5), la charnière (1) étant **caractérisée en ce que** la partie extérieure (2a) d'un des corps de charnière (2) est divisée en :

- un appendice (9) faisant partie intégrante de, et saillant de, la partie (2b) ou patte à fixer à la porte ou fenêtre (6) ;
- une douille tubulaire ou cartouche (10) enve-

loppant au moins en partie l'appendice (9) et associée de façon stable, à une extrémité, à la broche d'articulation (4) ;

- une broche (11) de pivotement de la cartouche ayant un axe (Z11) parallèle à l'axe de rotation (Z) et logée dans des trous coaxiaux (12, 13) respectifs de la cartouche (10) et de l'appendice (9) ;

- des moyens d'actionnement (17, 20) étant opérationnellement situés entre la cartouche (10) et l'appendice (9) de manière à mouvoir l'ouvrant (5) dans les deux directions le long de l'axe (X) parallèle au plan vertical de la porte ou fenêtre (6) en faisant tourner la cartouche (10) sur l'axe (Z11) de pivotement tout en maintenant coaxialement coïncidentes la cartouche (10) et la partie extérieure (3a) respective de l'autre (3) des deux corps de charnière.

2. La charnière selon la revendication 1, **caractérisée en ce que** l'appendice (9) en saillie se compose d'une première partie (9a) présentant le trou cylindrique (13) servant à loger la broche (11) de pivotement, à proximité de la zone d'union avec la partie ou patte (2b), et d'une deuxième partie (9b) définissant un prolongement sans interruption de la première partie (9a) et se resserrant vers son extrémité libre.

3. La charnière selon la revendication 1, **caractérisée en ce que** la cartouche (10) a une première extrémité fermée présentant un premier trou central (14) destiné à venir en prise stable avec la broche d'articulation (4), et un deuxième trou (12) décalé par rapport au premier trou (14) et destiné à loger une portion de la broche (11) de pivotement.

4. La charnière selon la revendication 1, **caractérisée en ce que** la cartouche (10) est ouverte dans le sens de la longueur pour former une section en « C » de manière à ce que, lors de l'utilisation, les extrémités libres de la section en « C » soient à proximité de l'appendice (9) en saillie ; l'espacement (D) entre les deux extrémités libres opposées étant supérieur à l'épaisseur (S) de l'appendice (9) en saillie.

5. La charnière selon la revendication 3, **caractérisée en ce que** la cartouche (10) est munie d'un chapeau (15) servant à fermer sa deuxième extrémité libre ; ledit chapeau (15) étant doté d'une fente (16) destinée à loger l'extrémité supérieure de la broche (11) de pivotement saillant d'un des trous cylindriques (13) de l'appendice (9) saillant du corps de charnière (2).

6. La charnière selon la revendication 1, **caractérisée en ce que** les moyens d'actionnement (8) comprennent une vis sans tête (17) vissée dans un trou (18)

passant transversalement à travers la deuxième partie (9b) de prolongement de l'appendice (9) en saillie ; ladite vis sans tête (17) étant en contact, et en butée bilatérale, avec la surface cylindrique intérieure de la cartouche (10).

5

en ce que la cartouche (10) est réalisée dans un matériau métallique.

7. La charnière selon la revendication 6, **caractérisée en ce que** la cartouche (10) a une fente traversante (19) destinée à permettre l'actionnement de la vis sans tête (17) de l'extérieur, de manière à obtenir un mouvement de l'ouvrant (5) le long de l'axe (X) parallèle au plan vertical de la porte ou fenêtre (6) en poussant la surface de butée intérieure de la cartouche (10) dans les deux directions afin de déplacer l'appendice (9) en saillie et la patte (2b) du corps de charnière (2), de pair avec l'ouvrant (5), et de faire tourner la cartouche (10) sur l'axe de rotation (Z11) défini par la broche (11) de pivotement. 10 15
8. La charnière selon la revendication 7, **caractérisée en ce que** la cartouche (10) peut avoir un élément cylindrique de couverture (50), ou chapeau, emboîté autour d'elle. 20
9. La charnière selon la revendication 3, **caractérisée en ce que** partie cylindrique (4a) de la broche d'articulation (4) associée à la cartouche (10) présente une surface extérieure rugueuse destinée à permettre à la broche (4) d'être solidaire de la cartouche (10). 25 30
10. La charnière selon la revendication 1, **caractérisée en ce que** les moyens d'actionnement (8) comprennent une demi-douille (20) tournante interposée intérieurement entre la cartouche (10) et l'extrémité libre de l'appendice (9) en saillie qui présente une portion cylindrique renflée (21) ; la demi-douille (20) ayant une section en « V » dont le sommet vient en prise avec la portion cylindrique renflée (21) de l'appendice (9) en saillie pour définir un autre pivot de rotation de la demi-douille (20) et de poussée de l'appendice (9) en saillie. 35 40
11. La charnière selon la revendication 10, **caractérisée en ce que** la demi-douille (20) a une surface avant (20a) de contact avec une surface intérieure de la cartouche (10) ; ladite surface avant (20a) étant dotée de dents (22) qui viennent en prise avec des rainures (23) correspondantes de la cartouche (10) de manière à permettre le réglage par pas par le biais d'une action d'accouplement/désaccouplement créée en forçant la demi-douille (20) à tourner autour de l'extrémité (21) de l'appendice (9) en saillie afin de produire une action de poussée pour régler l'appendice (9) en saillie et obtenir l'alignement de la cartouche (10). 45 50 55
12. La charnière selon la revendication 1, **caractérisée**

FIG.1

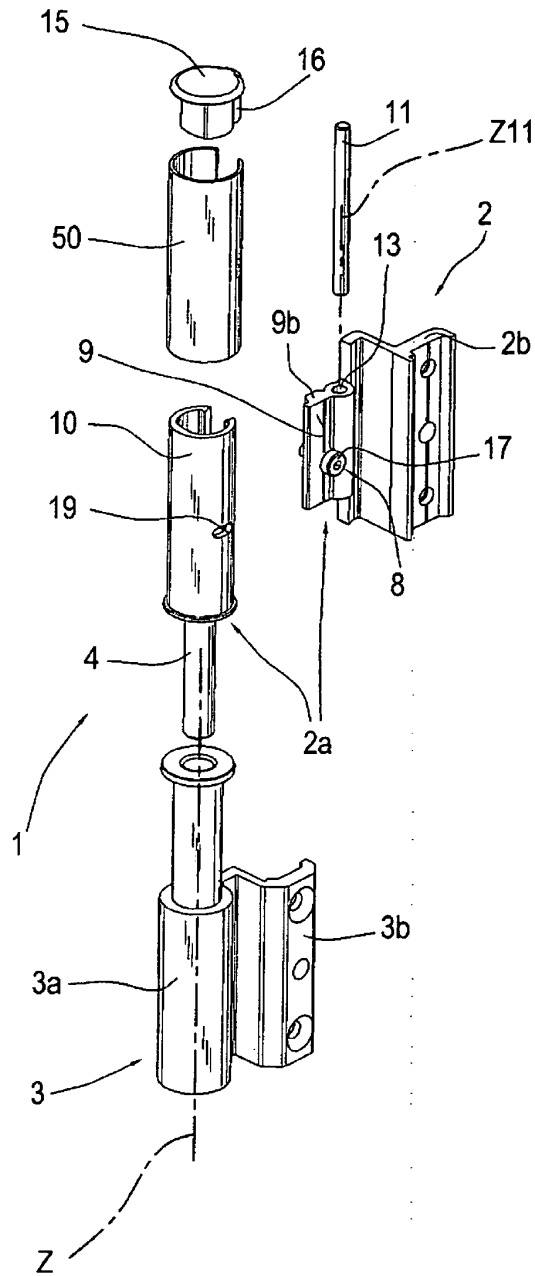


FIG.2

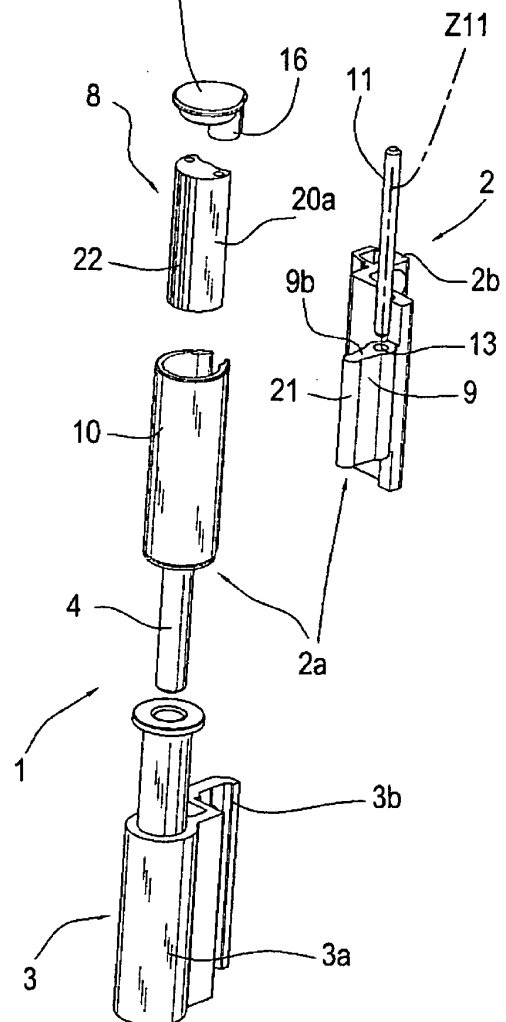


FIG.3

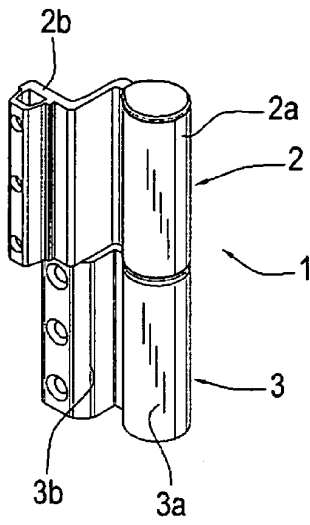


FIG.4

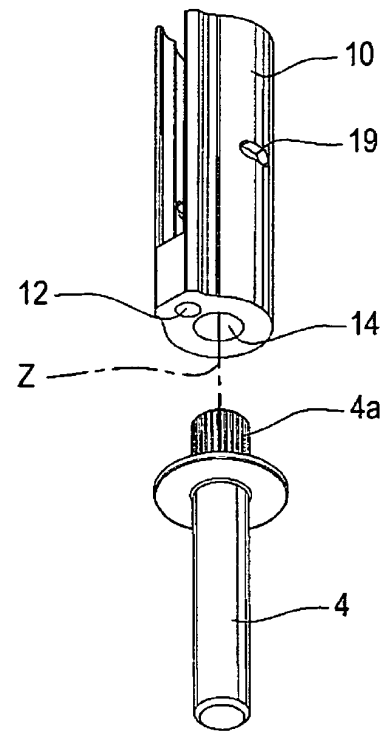


FIG.5

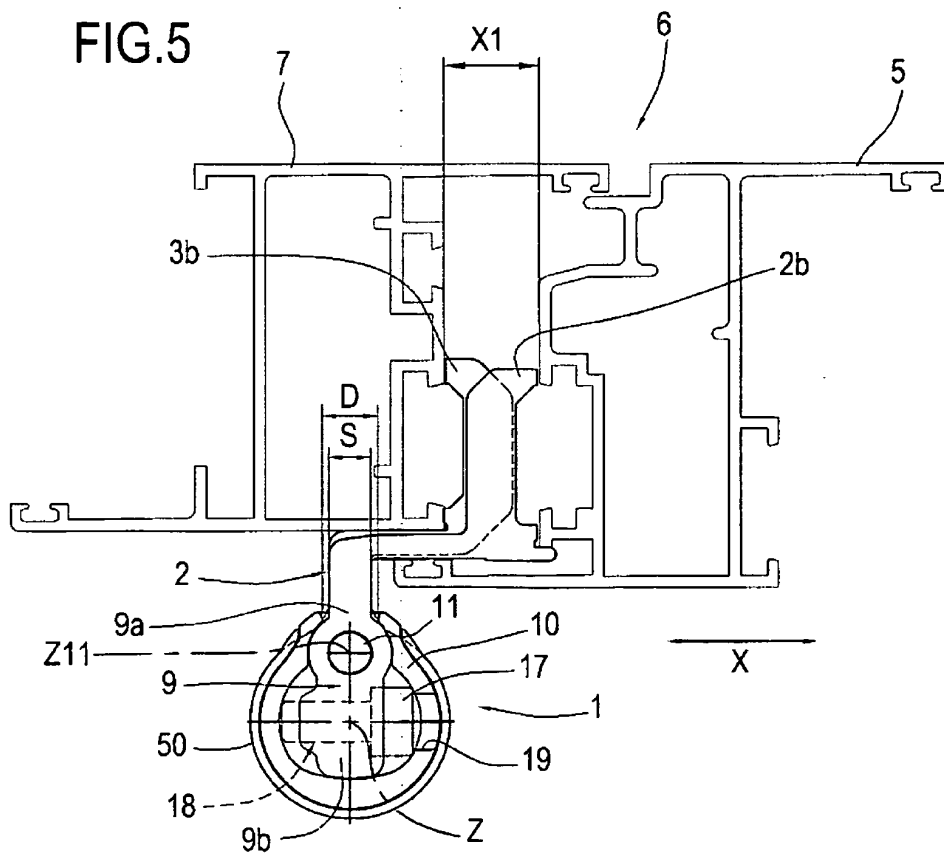


FIG.6

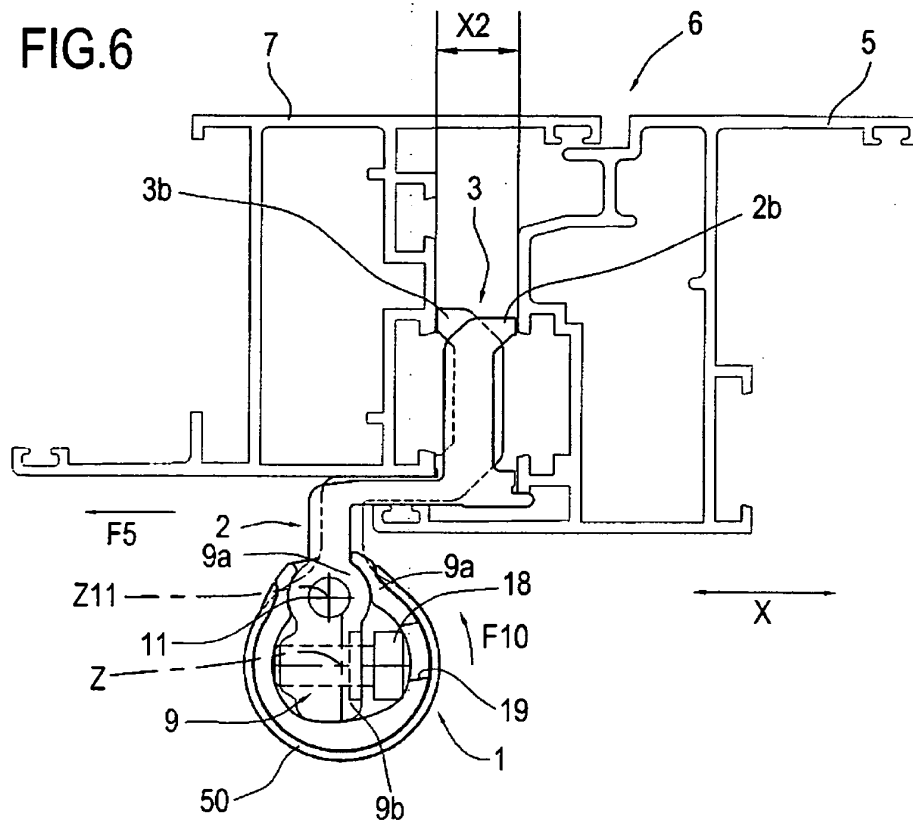


FIG.7

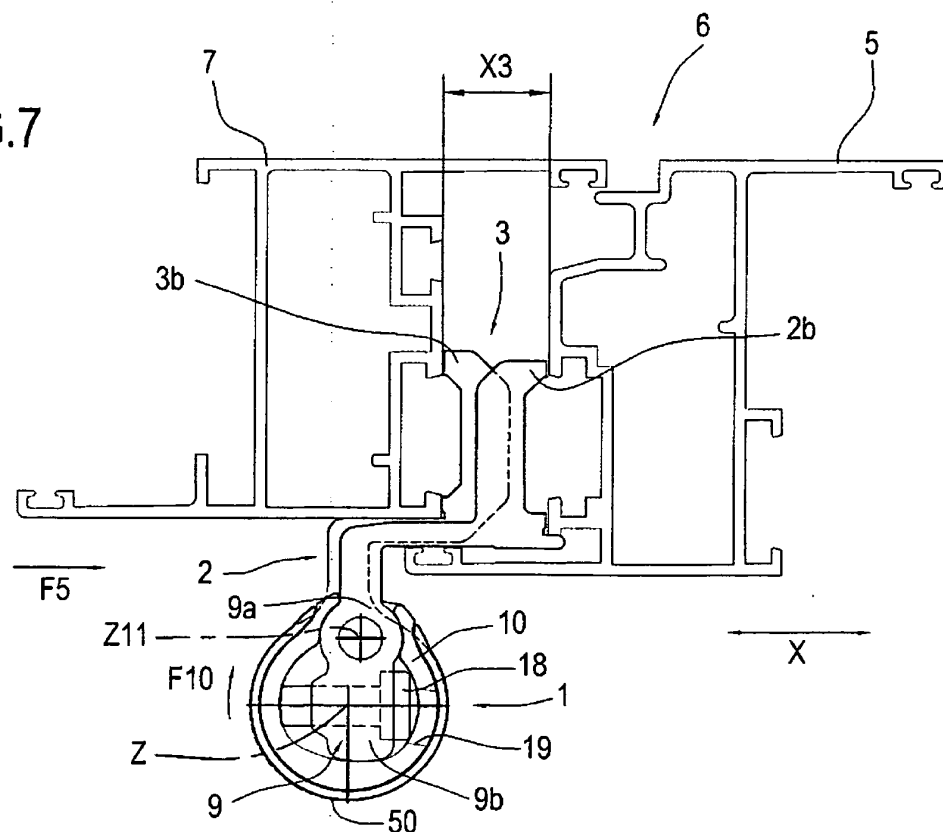
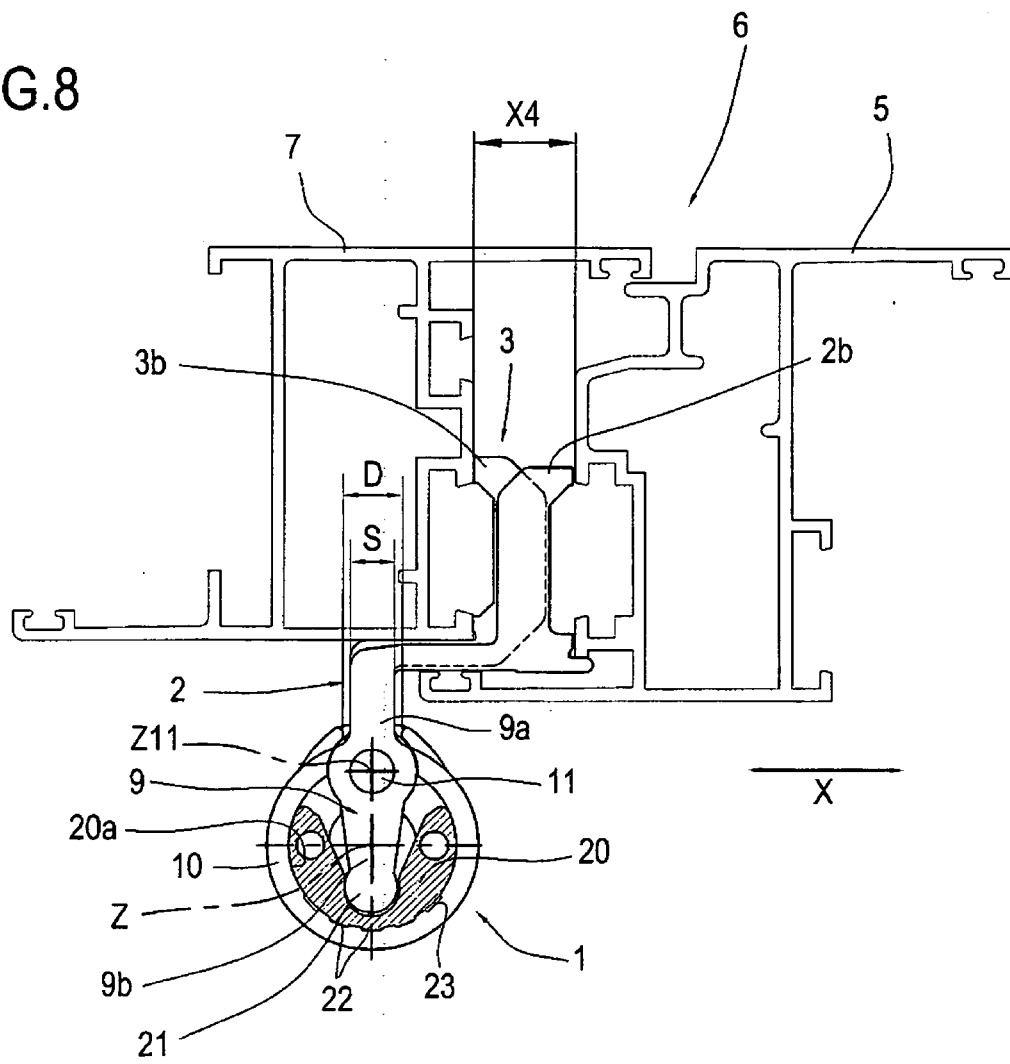
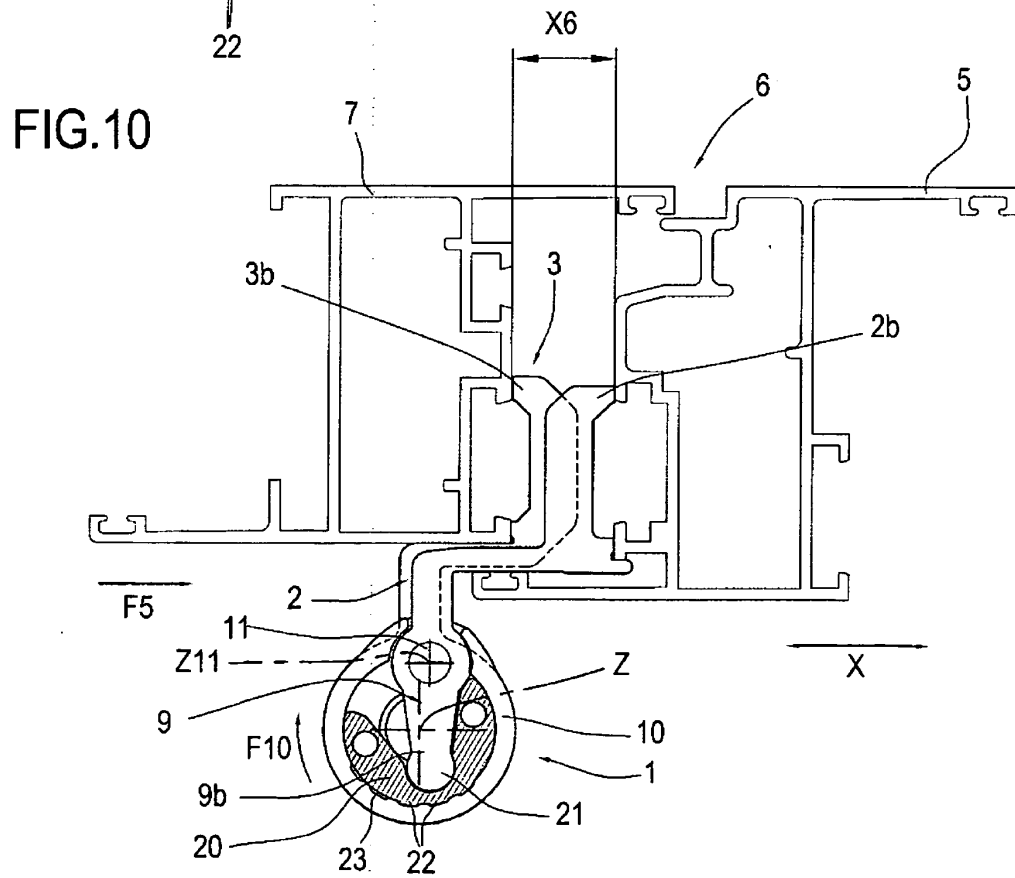
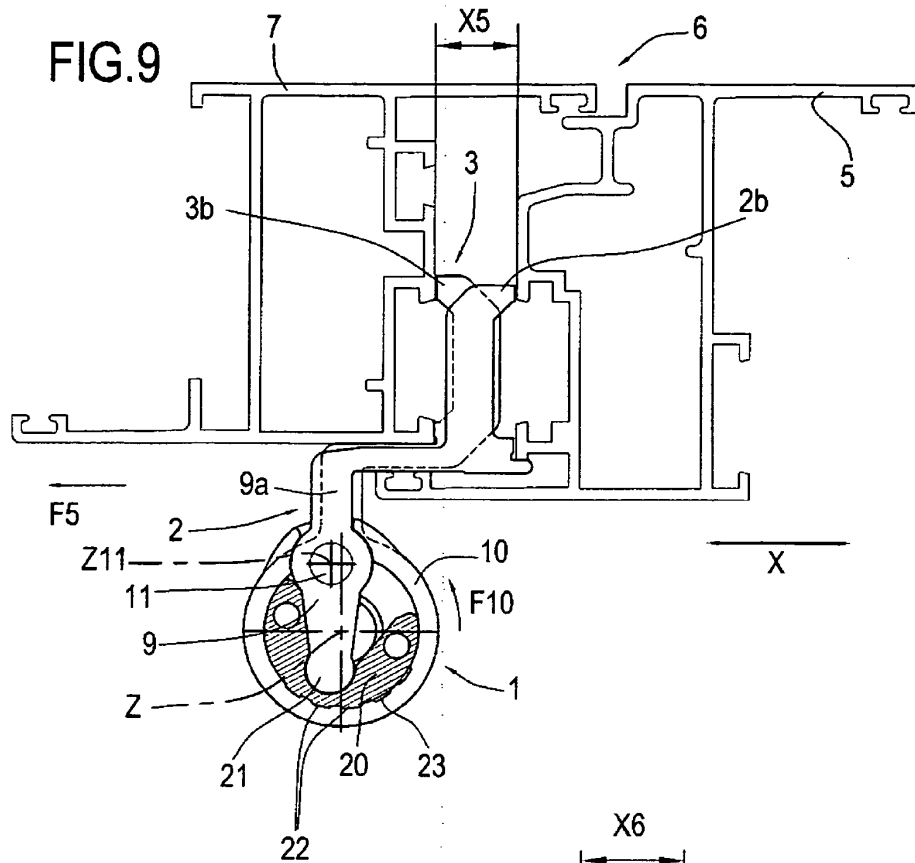


FIG.8





REFERENCES CITED IN THE DESCRIPTION

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