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(71) Applicant: **GIESSE S.P.A.**
40054 Budrio (BO) (IT)

(72) Inventor: **SANTO, Peter Reginald**
STOCKPORT, 56 8AE (GB)

(74) Representative: **Casadei, Barbara**
Bugnion S.p.A.
Via di Corticella, 87
40128 Bologna (IT)

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(54) **HINGE FOR A DOOR OR WINDOW**

(57) Described is a hinge for connecting a fixed frame and a mobile frame comprising: a first hinge body having a fixing plate which can be positioned at a channel of one of the frames and equipped with a device configured for stabilising the plate against the channel; a connecting wing ending with a cylindrical portion extends from the fixing plate; a second hinge body comprising at least one further plate which can be positioned, in use, at a channel of one of the frames and equipped with a relative device configured to stabilise the plate against the channel; a pair of connecting wings ending with a relative cylindrical portion extending from the at least one plate; the two distinct wings are positioned relative to each other, along the at least one plate, at a certain distance in such a way as to be positioned, in use, with the relative cylindrical portions at the respective ends of the cylindrical portion of the first hinge body; a common rotation pin housed inside the three cylindrical portions to define an axis of rotation of the mobile frame; the first hinge body has the fixing plate equipped with two through seats engaged by a corresponding fixing element and a third threaded through seat, whilst the clamping device comprises a counter plate housed inside the channel having a pair of holes which can be engaged by the fixing elements for connecting the plate to the counter plate with the interposition of a front surface of the channel, and a threaded grub screw protruding outside the channel, rotatably constrained in a hole made in the counter plate, and screwably coupled in the third threaded seat of the plate in such a way as to allow an adjustment, in both directions and along an axis perpendicular to the axis of rotation, of the distance of the first hinge body with respect to the surface of the channel.

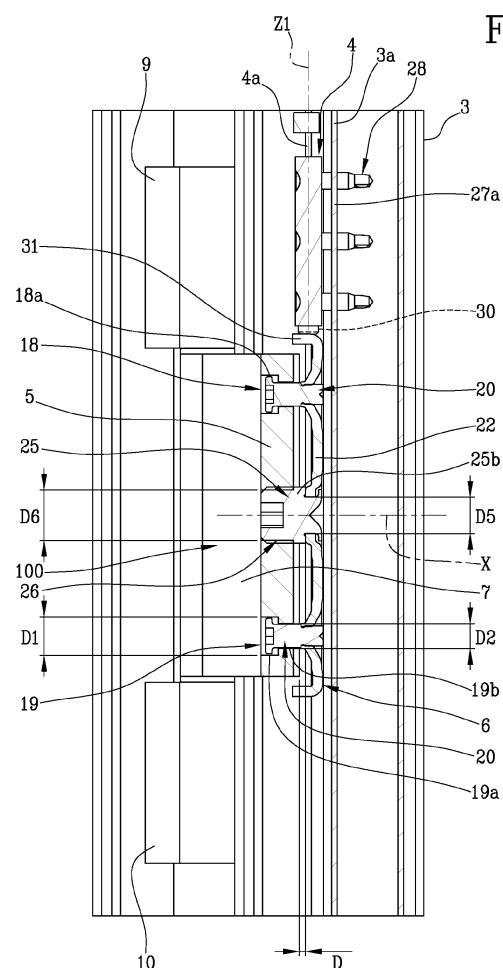


Fig. 2

Description

[0001] This invention relates to a hinge for a door or window, in particular for doors or windows made of metal, PVC or the like, aluminium - wood, etc. There are various prior art types of hinge used for opening and closing the above-mentioned doors or windows, each structurally different according to the planned use of the hinge, that is to say, on windows with traditional sash opening and tilt and turn opening, for light or heavy doors or windows, etc.

[0002] A prior art hinge for a door or window with a traditional sash or transom-type opening, which is of particular interest in this specification is that of the type known as "three wings" used for connecting a fixed frame and a mobile frame or sash of a door or window.

[0003] In particular, this type of hinge may be applied on doors and windows in which the profiles of the mobile frame and of the fixed frame have a perimeter channel with a tubular cross-section.

[0004] This tubular cross-section is partly open and formed, for example, by two wings protruding from the base surface of the relative fixed and mobile frame and with an inverted L-shaped cross-section opposite each other to form a partial surface parallel to the base surface.

[0005] This channel is used as a zone for coupling with connecting devices for the components of the hinge.

[0006] This type of hinge consists of:

- a first hinge body comprising a fixing plate which can be positioned, in use, at a zone of the channel of a mobile or fixed frame and equipped with a device for stably clamping the plate to the channel; a connecting wing ending with an eyelet or cylindrical portion extending from the fixing plate;
- a second hinge body comprising two separate bodies, each having a plate which can be positioned, in use, at a zone of the channel of the fixed or mobile frame and equipped with a device for stably clamping to the channel; a connecting wing ending with a cylindrical eye or portion extending from each body; the two separate bodies are positioned at a certain distance from each other along the common channel in such a way as to position, in use, with the respective eyelets or cylindrical portions at the respective ends of the eyelet of the first hinge body;
- a common rotation pin housed inside the three eyelets to define an axis of rotation of the mobile frame.

[0007] The above-mentioned devices for connecting the plates of the hinge bodies may be counter plates which can be inserted in the relative channel and which can then be fixed, by screws, to the plates of the hinge bodies in such a way as to clamp them on the partial surface of the channel of the corresponding frame.

[0008] However, this hinge structure has drawbacks due to the absence of adjustments, after assembly, both along the vertical axis and along a horizontal axis, per-

pendicular to the vertical axis, for adjusting the distance between the two frames with the sash closed.

[0009] In short, the hinge bodies are positioned along the relative channels and clamped there thanks to the counter plates.

[0010] At this point, a modification of the position of the hinge could only be possible along a vertical axis thanks to at least two technicians who loosen the screws at least of the one or more counter plates of the hinge body mounted on the mobile frame and then attempt to modify (by sliding) the position of the mobile frame with respect to the fixed frame to search for the correct position.

[0011] These operations are slow and complex and are not always successful in the most correct way for the end user, except by means of several attempts.

[0012] The aim of the invention is to provide a hinge for doors or windows which overcomes the above-mentioned drawbacks of the prior art.

[0013] The aim of the invention is to provide a hinge for doors or windows which is able to obtain adjustments on several axes of the mobile frame with the hinge mounted.

[0014] In particular, the aim of the invention is to provide a hinge for doors or windows which is able to use the fixing systems present to obtain adjustments on several axes, whilst maintaining a high level of operational safety over time.

[0015] Said aims are fully achieved by a hinge for doors and windows according to the invention as characterised in the appended claims.

[0016] The main features of the invention will become more apparent from the following detailed description of a preferred, non-limiting embodiment, illustrated purely by way of example in the accompanying drawings, in which:

- Figure 1 illustrates a perspective view of a hinge for doors or windows, according to the invention, applied to a door or window;
- Figure 2 illustrates a cross-section of a part of the door or window of Figure 1;
- Figure 3 illustrates an exploded perspective view of the hinge according to the invention.

[0017] With reference to the accompanying drawings, and with particular reference to Figure 1, the hinge according to the invention, labelled 100 in its entirety, is of the so-called "three-wing" type and is used for connecting doors or windows.

[0018] The drawings illustrate the hinge 100 for connecting, in use, doors or windows having a fixed frame 1 equipped with a channel 2 with a tubular cross-section partly open and protruding from a surface 1a of the fixed frame 1 and a mobile frame 3 equipped with a channel 4 with a tubular cross-section partly open and protruding from a surface 3a of the mobile frame 3.

[0019] It should be noted that the fixed frame 1 and the mobile frame 3 have a corresponding channel 2 and 4

with a tubular cross-section open towards the outside formed by two protruding wings 2a, 4a with an inverted L-shaped cross-section and opposite one other.

[0020] Again as illustrated in Figures 1 to 3, the hinge 100 comprises a first hinge body comprising a fixing plate 5 which can be positioned, in use, at a zone of the channel 2 or 4 of a mobile or fixed frame 3 or 1.

[0021] The first hinge body is equipped with a device 6 configured for stabilising the plate 5 against the channel 2 or 4.

[0022] A connecting wing 7 ending with a cylindrical portion 8 extends from the fixing plate 5.

[0023] Again as illustrated, the hinge 100 comprises a second hinge body comprising at least one further plate 9, 10 which can be positioned, in use, at a zone of the channel 2 or 4 of the fixed frame 1 or mobile frame 3 and equipped with a relative device 11, 12 configured to stabilise the plate 9, 10 against the channel 2 or 4.

[0024] A pair of connecting wings 13 and 14 ending with a relative cylindrical portion 15, 16 extend from the at least one plate 9, 10.

[0025] The two distinct wings 13, 14 are positioned relative to each other, along the at least one plate 9, 10, at a certain distance in such a way as to be positioned, in use, with the relative cylindrical portions 15, 16 at the respective ends of the cylindrical portion 8 of the first hinge body. According to the embodiment (non-limiting) illustrated in Figures 1 to 3, the second hinge body comprises a separate pair of plates 9, 10 which can be positioned, in use, at a zone of the channel 2 or 4 of the fixed frame 1 or mobile frame 3 and equipped with a respective device 11, 12 for stably clamping the plates 9, 10 to the channel 2 or 4.

[0026] A pair of connecting wings 13 and 14 ending with a cylindrical portion 15, 16 extend from each plate 9, 10.

[0027] The two separate plates 9, 10 are positioned at a certain distance from each other along the common channel 2 or 4 in such a way as to be positioned, in use, with the relative cylindrical portions 15 and 16 at the respective ends of the cylindrical portion 8 of the first hinge body.

[0028] The hinge 100 also comprises a common rotation pin 17 housed inside the three cylindrical portions 8, 15 and 16 to define an axis Z100 of rotation of the mobile frame 3.

[0029] For convenience of description, according to the example illustrated (non-limiting) the first hinge body is associated with the mobile frame 3, whilst the second hinge body is associated with the fixed frame 1.

[0030] Again as illustrated, the first hinge body comprises the fixing plate 5 equipped with at least two through seats 18, 19 engaged by a corresponding fixing element 20 and a third threaded through seat 21. The first hinge body also has the stabilising device 6 comprising a counter plate 22 housed inside the channel 4 and having a pair of holes 23, 24 which can be engaged by the fixing element 20 for connecting the plate 5 to the counter plate

22 with the interposition of a front surface of the channel 2 or 4.

[0031] The counter plate 22 has a threaded grub screw 25 protruding at least partly, in use, outside the channel 4.

[0032] The threaded grub screw 25 is rotatably constrained in a hole 26 made in the counter plate 22, and screwably coupled in the third threaded seat 21 of the plate 5 in such a way as to allow an adjustment, in both directions and along an axis X perpendicular to the axis Z100 of rotation, of the distance D of the first hinge body relative to the front surface of the channel 4.

[0033] The front surface of the wings 2, 4 is the one furthest from (and parallel to) the corresponding surface 1a, 3a of the fixed frame 1 and of the mobile frame 3 which thus defines the front surface or contact surface for the plate 5 of the first hinge body and for the two plates 9, 10 of the second hinge body.

[0034] It should be noted that the pair of seats 18 and 19 of the plate 5 for housing the fixing elements 20 each have a first inlet portion 18a, 19a having a first diameter D1 and a second outlet portion 18b, 19b with a second diameter D2 less than the first diameter D1.

[0035] In light of this, each fixing element 20 comprises a screw having a rod 20a at least partly threaded passing, in use, through the second outlet portion 18b, 19b of the seat 18, 19 of the plate 5 and screwably coupled in the relative hole 23, 24 of the counter plate 22, and an operating head 20b, having a diameter D3 greater than a diameter D4 of the rod 20a, housed, in use, in the inlet portion 18a, 19a of the seat 18, 19 of the plate 5 in such a way as to allow, with the plate 5 fixed, a free sliding for adjustment of the plate 5 of the first hinge body.

[0036] It should be noted that the possibility of adjusting the plate 5 is due to the fact that the inlet portion 18a, 19a of the holes 18, 19 of the plate 5 has a depth greater than the thickness of the relative operating head 20b. Moreover, the rod 20a at least partly threaded of each screw has a length such that it allows, once constrained in the hole 23 or 24 of the counter plate 22, the head 20b to be left in position at a certain distance from the bottom of the inlet portion 18a, 19a in such a way as to allow the free movement for adjustment of the plate 5 along the axis X also with the plate 5 fixed.

[0037] In light of this, the rod 20a may be divided into a threaded end portion with a diameter less than the diameter D4 of the remaining central portion of the rod (integral with the head 20b) which is not threaded.

[0038] It should be noted that the threaded grub screw 25 comprises a first part composed of a pin 25a having a first diameter D5 axially constrained, but with the possibility of rotating about its axis (for example by pressing the end of the pin 25a), in the cavity 26 of the counter plate 22, and a second threaded portion 25b, having a second diameter D6 greater than the first diameter D5 of the pin 25a, coupled, in use, in the third threaded seat 21 of the fixing plate 5.

[0039] Therefore, thanks to the structure of the fixing elements, of the seats in the plate and the presence of

the threaded grub screw, the plate 5 may be moved towards or away from the front surface of the channel in order to be able to adjust the correct distance between the two frames 1 and 3.

[0040] Again as illustrated, the hinge 100 comprises a reference and adjustment unit 27 along a vertical axis Z1, parallel to the axis Z100 of rotation, between the hinge 100 and the mobile frame 3.

[0041] The reference and adjustment unit 27 is positioned, in use, in the tubular channel 4.

[0042] The reference and adjustment unit 27 is also equipped with a first fixing portion 27a which can be stably coupled in the tubular channel 4 of the mobile frame 3.

[0043] In light of this, the reference and adjustment unit 27 has the first portion 27a configured to be coupled, by sliding or by a front snap-on connection, in the tubular channel 4 of the mobile frame 2 in which the fixing counter plate 22 is inserted.

[0044] The reference and adjustment unit 27 also has fixing means 28 to stabilise its position in the channel 4 in such a way as to define, with a relative end, a reference point at a height for the plate 5 of the first hinge body, by the stable contact with an end of the counter plate 22.

[0045] In light of this, the reference unit 27 has a second portion 29 outside the tubular channel 4 equipped with means 30 for adjusting the position adopted by the counter plate 22 and configured for modifying the relative position between the hinge 100, already fixed, and the mobile frame 3 and along the tubular channel 4 by a pushing or a release on a point of contact with the counter plate 22.

[0046] In particular, the counter plate 22 is equipped with at least one transversal wing 31 made at a relative end and protruding from the channel 4 in such a way as to define, in use, the point of contact with the adjustment means 30.

[0047] The adjustment means 30 may comprise a screw housed longitudinally along the second portion 29 (in a relative corresponding open seat). The screw has a first end with an operating head (to allow its rotation) and a second flat end for contact with the contact wing 31 of the counter plate. The weight of the mobile frame 3 allows, once the hinge 100 is mounted and fixed, the flat end of the screw to be maintained in contact with the wing 31 and to be able to push it to lift the mobile frame 3 or to release it to lower the mobile frame 3 with respect to the position of the hinge 100 and therefore of the fixed frame 1.

[0048] Substantially, thanks to the structure of the plate and of the counter plate and of the system for adjustment along the horizontal axis, the adjustment in height of the mobile frame 3 can be performed without having to loosen any of the fixing screws of the hinge 100.

[0049] This allows a fast and precise adjustment of the position both of the hinge and of the mobile frame both during assembly and after assembly, that is to say, with the door or window in use.

[0050] A hinge structured in this way achieves the pre-

set aims thanks to a system for fixing to the channel of the first hinge body to the mobile frame which is extremely secure and precise, but provided with adjustment both along an axis perpendicular to the axis of rotation and along an axis parallel to the axis of rotation with the hinge already mounted and fixed.

[0051] This structure allows quick and easy coupling to the mobile frame removed with the possibility of positioning the hinge precisely.

[0052] The fixing unit structure guarantees reliability over time of the mobile structure and, if necessary, convenient adjustment and without the need for loosening the components, thus making the entire structure very safe.

Claims

1. A hinge for connecting, in use, a fixed frame (1) equipped with a channel (2) with a tubular cross-section partly open and protruding from a surface (1a) of the fixed frame (1) and a mobile frame (3) equipped with a channel (4) with a tubular cross-section partly open and protruding from a surface (3a) of the mobile frame (3) and forming, in use, a door or window; the hinge (100) comprising:

- a first hinge body comprising a fixing plate (5) which can be positioned, in use, at a zone of the channel (2 or 4) of a mobile frame (3) or a fixed frame (1) and equipped with a device (6) configured to stabilise the plate (5) against the channel (2 or 4); a connecting wing (7) ending with a cylindrical portion (8) extending from the fixing plate (5);

- a second hinge body comprising at least one further plate (9, 10) which can be positioned, in use, at a zone of the channel (2 or 4) of the fixed frame (1) or mobile frame (3) and equipped with a relative device (11, 12) configured to stabilise the plate (9, 10) against the channel (2 or 4); a pair of connecting wings (13 and 14) ending with a relative cylindrical portion (15, 16) extending from the at least one plate (9, 10); the two distinct wings (13, 14) are positioned relative to each other, along the at least one plate (9, 10), at a certain distance in such a way as to be positioned, in use, with the relative cylindrical portions (15, 16) at the respective ends of the cylindrical portion (8) of the first hinge body;

- a common rotation pin (17) housed inside the three cylindrical portions (8, 15, 16) to define an axis (Z100) of rotation of the mobile frame (3); **characterised in that** the first hinge body comprises:

- the fixing plate (5) equipped with at least two through seats (18, 19) engaged by a corresponding fixing element (20) and a third thread-

- ed through seat (21); and
 - the stabilising device (6) comprising a counter plate (22) housed inside the channel (2 or 4) having a pair of holes (23, 24) which can be engaged by the fixing elements (20) for the connection of the plate (5) to the counter plate (22) with the interposing a front surface of the channel (2 or 4), and a threaded grub screw (25) protruding at least partly, in use, outside the channel (2 or 4), rotatably constrained in a hole (26) made in the counter plate (22), and screwably coupled in the third threaded seat (21) of the plate (5) in such a way as to allow an adjustment, in both directions and along an axis (X) perpendicular to the axis (Z100) of rotation, of the distance (D) of the first hinge body relative to the front surface of the channel (2 or 4).
2. The hinge according to claim 1, wherein the pair of seats (18 and 19) of the plate (5) for housing the fixing elements (20) each have a first inlet portion (18a, 19a) having a first diameter (D1) and a second outlet portion (18b, 19b) with a second diameter (D2) less than the first diameter (D1).
 3. The hinge according to claim 2, wherein each fixing element (20) comprises a screw having a rod (20a) at least partly threaded passing, in use, through the second outlet portion (18b, 19b) of the seat (18, 19) of the plate (5) and screwably coupled in the relative hole (23, 24) of the counter plate (22) and an operating head (20b), having a diameter (D3) greater than a diameter (D4) of the rod (20a), housed, in use, in the inlet portion (18a, 19a) of the seat (18, 19) of the plate (5) in such a way as to allow, with the plate (5) fixed, a free sliding for adjustment of the plate (5) of the first hinge body.
 4. The hinge according to any one of the preceding claims, wherein the threaded grub screw (25) comprises a first part composed of a pin (25a) having a first diameter (D5) axially constrained, but with the possibility of rotating about its axis, in the cavity (26) of the counter plate (22), and a second threaded portion (25b), having a second diameter (D6) greater than the first diameter (D5) of the pin (25a), coupled, in use, in the third threaded seat (21) of the fixing plate (5).
 5. The hinge according to any one of the preceding claims, comprising an reference and adjustment element (27) along a vertical axis (Z1), parallel to the axis (Z100) rotation, between the hinge (100) and the mobile frame (3) and positioned, in use, in the tubular channel (2 or 4); the reference and adjustment unit (27) being equipped with a first fixing portion (27a) which can be stably coupled in the tubular channel (2 or 4) of the fixed frame (1) or of the mobile frame (3).
 6. The hinge according to claim 5, wherein the reference and adjustment unit (27) has the first portion (27a) configured for coupling, by sliding or by front snap-on coupling, in the tubular channel (2 or 4) of the fixed frame (1) or of the mobile frame (2) in which the fixing counter plate (22) is inserted, and fixing means (28) to stabilise its position in the channel (2 or 4) in such a way as to define, with one end of it, a reference point at a height for the plate (5) of the first hinge body, through the stable contact with an end of the counter plate (22).
 7. The hinge according to claim 6, wherein the reference unit (27) has a second portion (29) outside the tubular channel (2 or 4) equipped with means (30) for adjusting the position adopted by the counter plate (22) and configured for modifying the relative position between the hinge (100), already fixed, and the mobile frame (3) and along the tubular channel (2 or 4) by a pushing or a release on a point of contact with the counter plate (22).
 8. The hinge according to claim 7, wherein the counter plate (22) is equipped with at least one transversal wing (31) made at a relative end and protruding from the channel (2 or 4) in such a way as to define, in use, the point of contact with the adjustment means (30).
 9. The hinge according to any one of the preceding claims, wherein the fixed frame (1) and the mobile frame (3) have the corresponding channel (2, 4) with a tubular cross-section open towards the outside defined by two wings (2a, 4a) protruding with an inverted L-shaped cross-section and opposite one other, and wherein the outer portion of the wings (2a, 4a) further from the corresponding surface (1a, 3a) of the fixed frame (1) or of the mobile frame (3) defines the front surface or the contact surface for the plate (5) of the first hinge body and for the two plates (9, 10) of the second hinge body.

Fig.1

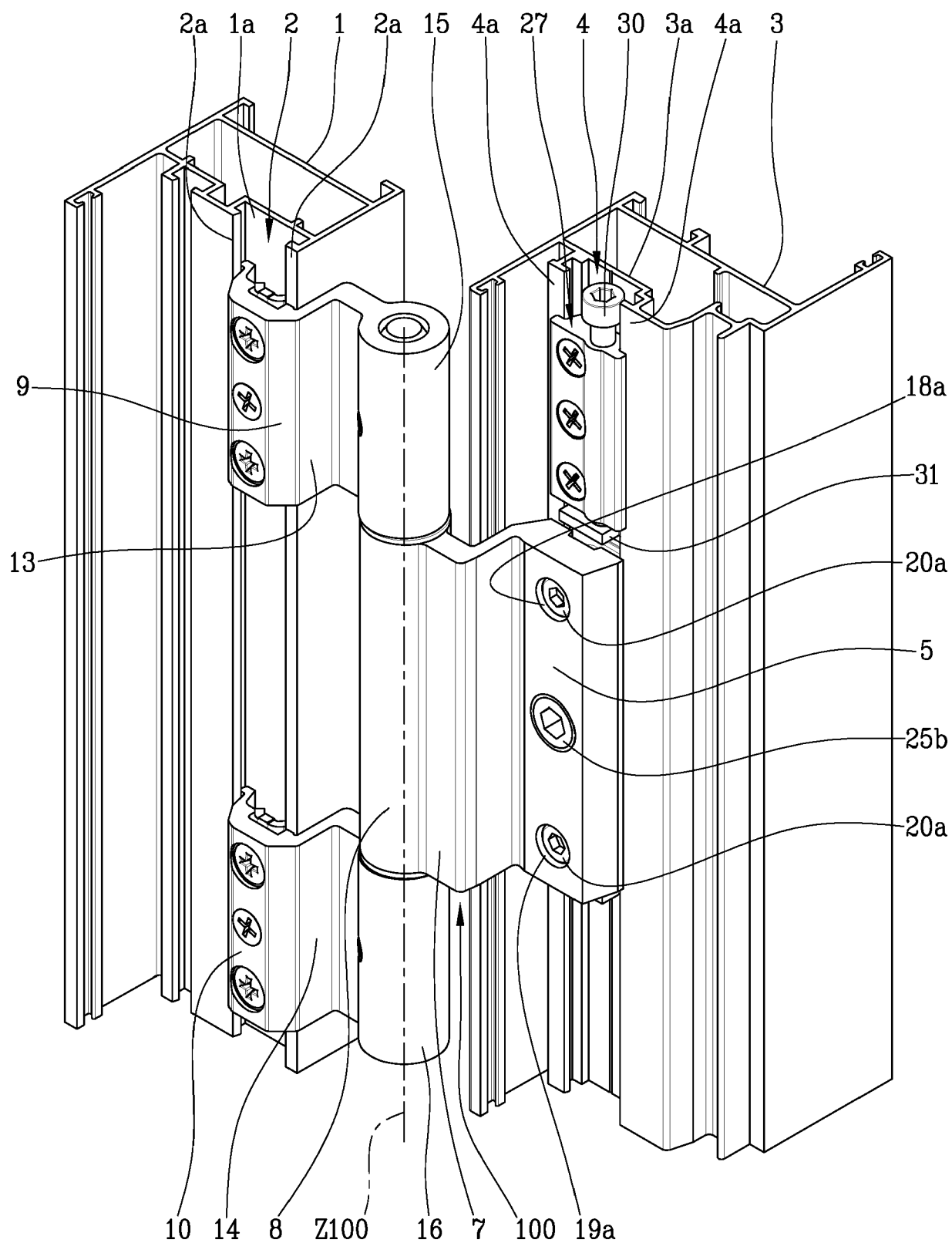


Fig.2

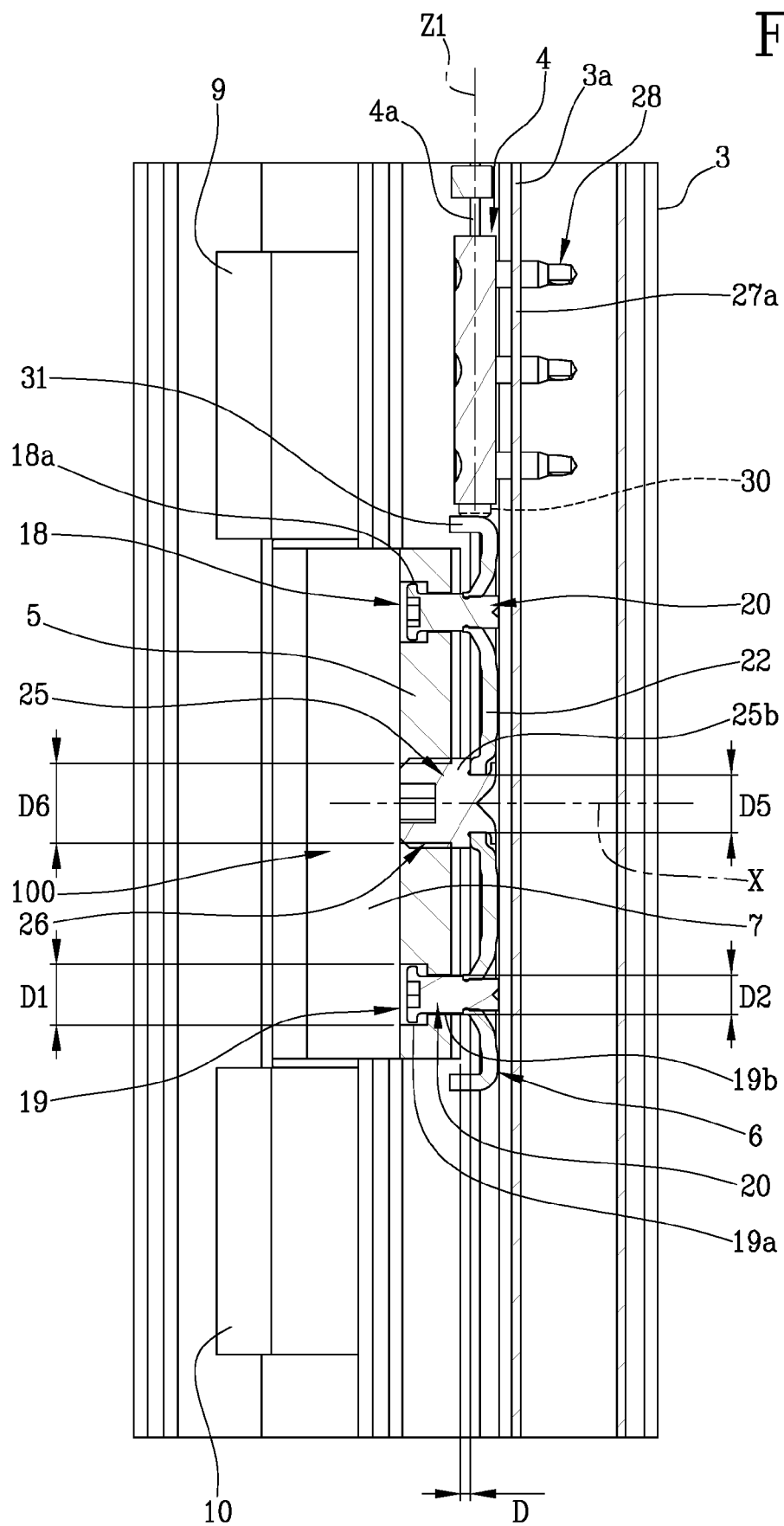
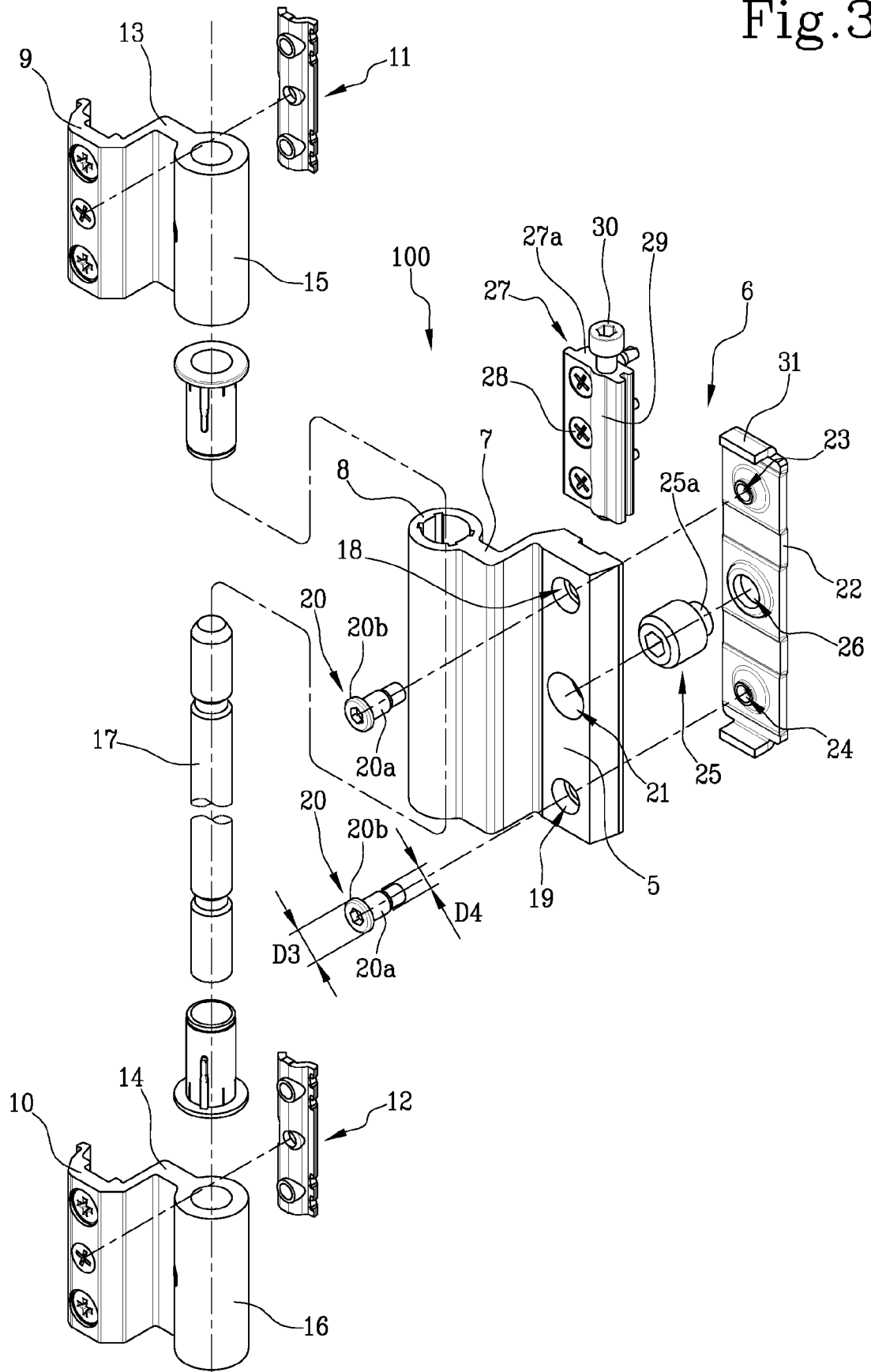


Fig.3





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The present search report has been drawn up for all claims			
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CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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