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(54) **Hinge for a frame**

Scharnier für einen Rahmen

Charnière pour un cadre

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EP 1 835 101 B1

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Description

FIELD OF THE INVENTION

[0001] The present invention concerns a hinge for a frame, such as for example a main door, a window, a door of a building or of a furnishing element, or other, provided with a closing element and a fixed structure. The hinge according to the present invention is of the type with three elements, of which one, intermediate, fixed to the closing element, and two, terminal, or lateral, disposed respectively one above and one under the intermediate one, and fixed to the fixed structure, or vice versa. The terminal elements are pivoted to the intermediate element along the same pivoting axis so as to allow the articulation of the closing element with respect to the fixed structure (see e.g. EP-A-0796969).

BACKGROUND OF THE INVENTION

[0002] Hinges are known, used to articulate a closing element of a frame with respect to a fixed structure and comprising two terminal bushings, or elements, and one intermediate bushing, or element, interposed between the two terminal bushings, which is normally fixed to the closing element through screwing.

[0003] The three bushings are pivoted to each other by means of a single central pin, along the same pivoting axis.

[0004] Normally it is necessary to regulate the distance between the intermediate bushing and the closing element, for example in order to align the pivoting axes of the hinges of the same frame with each other.

[0005] However, in order to perform such operation, known hinges require dismantling the central pin, moving the closing element away from the fixed structure, and screwing/unscrewing the intermediate bushing so as to move it closer to/away from the closing element.

[0006] As the intermediate bushing must be disposed coaxial to the two terminal bushings, so as to allow the insertion of the pin, the above regulation does not allow a continuous variation of the distance, but only certain increases or decreases, with a consequent imprecise regulation.

[0007] One purpose of the present invention is to achieve a hinge of the type with three elements, which allows to vary the distance between the intermediate element and the structural element, for example the closing element or the fixed structure, of a frame, in a continuous and rapid manner, without needing to dismantle the frame or the hinge.

[0008] Another purpose of the present invention is to achieve a hinge, which also allows to regulate, substantially along the pivoting axis, the position of the intermediate element with respect to the two terminal elements, in a continuous and rapid manner, without needing to dismantle the frame or the hinge.

[0009] The Applicant has devised, tested and embodied

the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0010] The present invention is set forth and characterized in the independent claim, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0011] In accordance with the above purposes, a hinge according to the present invention can be used in order to articulate a mobile structural element, such as the closing element of a frame, with respect to a fixed structural element, for example a fixed structure.

[0012] The hinge according to the present invention comprises:

- two terminal hinging elements, or terminal bushings, able to be fixed to one of the two structural elements;
- an intermediate hinging element, or intermediate bushing, mounted between the two terminal elements and able to be fixed to the other of the two structural elements; and
- pivoting means able to axially pivot the intermediate element and the two terminal elements to each other along the same pivoting axis.

[0013] According to a characteristic of the present invention, the intermediate element comprises a central cavity which has a substantially orthogonal development with respect to the pivoting axis, and able to house a regulation element.

[0014] The regulation element is for example a screw, or suchlike, and is housed inside the central cavity, free to rotate with respect to the intermediate element.

[0015] The regulation element is also able to be disposed in cooperation with the structural element with which the intermediate element cooperates, and can be driven in order to modify the distance between the structural element and the pivoting axis.

[0016] The intermediate element also comprises two seatings, disposed on opposite sides with respect to the central cavity and developing substantially parallel to the pivoting axis.

[0017] The pivoting means comprises two pins each of which is associated with a corresponding terminal element and is able to cooperate with a respective seating, so as to allow the articulation of the mobile structural element with respect to the fixed structural element.

[0018] The hinge according to the present invention therefore allows to vary the distance between the intermediate element and the structural element with which the intermediate element cooperates, in a continuous and rapid manner, without needing to dismantle the frame or the hinge.

[0019] According to an advantageous solution of the invention, each pin comprises a respective end able to

be disposed in cooperation with a sliding element, for example a ball, disposed in the corresponding seating.

[0020] According to another advantageous solution of the invention, each pin is joined to the corresponding terminal element by screwing, so as to maintain the respective end in contact with the respective sliding element.

[0021] Furthermore, the pins are able to be screwed/unscrewed with respect to the corresponding terminal element independently from each other, allowing to regulate the position of the intermediate element with respect to the two terminal elements in a continuous manner and without needing to dismantle the hinge.

[0022] It comes within the field of protection of the present invention to provide an intermediate hinging element of the type described heretofore.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] These and other characteristics of the present invention will become apparent from the following description of a preferential form of embodiment, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a lateral view, partially sectioned, of a hinge according to the present invention mounted on a frame;
- fig. 2 is another lateral view of the hinge in fig. 1;
- fig. 3 is a plane view of the hinge in fig. 1;
- fig. 4 is a lateral view of a variant of the hinge in fig. 1;
- fig. 5 is a plane view of the variant in fig. 4;
- fig. 6 is a lateral view of another variant of the hinge in fig. 1.

DETAILED DESCRIPTION OF A PREFERENTIAL FORM OF EMBODIMENT

[0024] With reference to fig. 1, a hinge 10 according to the present invention can be used in order to articulate a closing element 12 of a frame with respect to a fixed structure 14.

[0025] The hinge 10 comprises two terminal bushings, respectively first 16 and second 18, and an intermediate bushing 20 mounted between the two terminal bushings 16, 18 and pivoted thereto along a pivoting axis I.

[0026] The two terminal bushings 16, 18 (figs. 1, 2 and 3) each comprise a corresponding attachment shank 22, 24, able to be fixed to the fixed structure 14, and the intermediate bushing 20 comprises, in this specific case, two guiding shanks 26 able to be coupled to the closing element 12.

[0027] The intermediate bushing 20 also comprises a central cavity 32 (fig. 1), developing substantially orthogonal with respect to the pivoting axis I, and able to house a regulation element, which, in the case shown here, is a screw 34 which can be screwed to the closing element 12.

[0028] The screw 34 has a circular seating 36 able to cooperate with a mating retaining element, of the known type and not shown in the drawings, such as a Seger ring, or one or more balls locked into the central cavity 32.

[0029] The screw 34 is therefore constrained transversely to the intermediate bushing 20, but can rotate with respect to a rotation axis R substantially orthogonal to the pivoting axis I, so that it can be screwed/unscrewed with respect to the closing element 12 in order to modify the distance between the intermediate bushing 20 and the closing element 12.

[0030] The intermediate bushing 20 also comprises two seatings, respectively first 40 and second 42, disposed on opposite sides with respect to the central cavity 32 and with a development substantially longitudinal and parallel to the pivoting axis I.

[0031] Optionally, each seating 40 and 42 is lined internally with a lining 44 made of anti-wear material, preferably plastic material, such as polyamide.

[0032] Each seating 49 and 42, in the part facing towards the central cavity 32, comprises a hollow 46, able to contain a respective ball 48, for example made of hardened steel, or of a material with similar mechanical characteristics.

[0033] The hinge 10 also comprises two pins, respectively first 50 and second 52, each of which is provided with a threaded portion 54, cylindrical in shape and, on the opposite end, a ferrule 56.

[0034] Each pin 50, 52 also has a head, opposite with respect to the ferrule 56, in which a screwing seating 57 is made, for example hexagonal in shape, in order to insert a tool, such as a socket head wrench.

[0035] Each of the two terminal bushings 16, 18 comprises a threaded cylindrical seating 58, made internally.

[0036] Each pin 50, 52 is able to be connected to a respective terminal bushing 16, 18 by screwing the threaded portion 54 to the cylindrical threaded seating 58 of the corresponding terminal bushing 16, 18 and is able to be inserted into a respective seating 40, 42, disposing the ferrule 56 in contact with the corresponding ball 48.

[0037] By screwing the first pin 50 into the corresponding threaded portion 54 of the first bushing 16 and the second pin 52 into the corresponding threaded portion 54 of the second bushing 18, the intermediate bushing 20 is constrained between the two pins 50, 52, without the possibility of axial movement.

[0038] By screwing the first pin 50 into the corresponding threaded portion 54 and unscrewing the second pin 52 from the corresponding threaded portion 54, the intermediate bushing 20 moves away from the first bushing 16 and towards the second bushing 18.

[0039] By unscrewing the first pin 50 from the corresponding threaded portion 54 and screwing the second pin 52 into the corresponding threaded portion 54, the intermediate bushing 20 moves towards the first bushing 16 and away from the second bushing 18.

[0040] In this way, the relative position of the interme-

diate bushing 20 with respect to the two terminal bushings 16, 18 can be regulated in height by screwing/unscrewing the pins 50, 52 with respect to the corresponding threaded portions 54.

[0041] Thanks to the coupling between the ferrule 56 of each pin 50, 52 and the corresponding ball 48, and to the coupling between the lateral surface of each pin 50, 52 and the lining 44, the intermediate bushing 20 is free to rotate with respect to the two terminal bushings 16, 18, so as to allow the articulation of the closing element 12 with respect to the fixed structure 14.

[0042] According to the variant shown in figs. 4 and 5, the two terminal bushings 16, 18 are connected to each other by means of a platelet 60 made, for example, of metal.

[0043] The platelet 60 can be optionally provided with one or more lateral pins 62, in this specific case two, able to be inserted into corresponding guide holes made in the fixed structure 14.

[0044] The two lateral pins 62 are obtained, for example, by cutting to measure the surface of the platelet 60 so as to achieve two tongues that are then bent towards the outside until they are disposed substantially orthogonal to said surface.

[0045] According to the variant in fig. 6, the two terminal bushings 16, 18 are connected to each other by means of a retaining element 64, which is in turn fixed to the fixed structure 14 through screwing, or other method.

[0046] The hinge 10 also comprises two washers, or ring nuts, respectively first 66 and second 68, which can be screwed into the respective threaded portion 54 so as to function as lock nut for the relative pin 50, 52.

[0047] Each ring nut 66, 68 has a through screwing hole 70, for example hexagonal in shape, in order to facilitate the screwing/unscrewing of the ring nut 66, 68, for example by means of a socket head wrench.

[0048] Advantageously, the longitudinal axis of the through screwing hole 70 of each ring nut 66, 68 is misaligned with respect to the longitudinal axis of the screwing seating 57 of the relative pin 50, 52, so that, during the assembly phases, the socket head wrench does not contact the underlying screwing seating also screwing/unscrewing the pin 50, 52.

[0049] It is clear that modifications and/or additions of parts may be made to the hinge 10 as described heretofore, without departing from the field and scope of the present invention.

[0050] It is also clear that, although the present invention has been described with reference to some specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of hinge for frames, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

Claims

1. Hinge for articulating a mobile structural element (12), such as a closing element of a frame or suchlike, with respect to a fixed structural element (14) such as a fixed structure or suchlike, comprising:

- two terminal hinging elements (16, 18) able to be fixed to one of said structural elements (12, 14);
- an intermediate hinging element mounted between said two terminal elements (16, 18) and able to be fixed to the other of said structural elements (14, 12); and
- pivoting means able to pivot axially with respect to each other said intermediate element and said two terminal elements (16, 18) along the same pivoting axis (I); said intermediate element (20) comprising:
 - a single central cavity (32) with a substantially orthogonal development with respect to said pivoting axis (I), and able to house a regulation element (34), which in turn is able to be disposed in cooperation with the structural element (14, 12), with which said intermediate element (20) cooperates, and can be driven in order to modify the distance between said structural element (14, 12) and said pivoting axis (I); and
 - two seatings (40, 42), disposed on opposite sides with respect to said central cavity (32) and with a development substantially parallel to said pivoting axis (I), wherein said pivoting means comprises two pins (50, 52), each of which is associated with a corresponding terminal element (16, 18) and is able to cooperate with a respective one of said seatings (40, 42), in order to allow the articulation of said mobile structural element (12) with respect to said fixed structural element (14),

wherein said pins (50, 52) comprise an inner end facing towards the intermediate element (20) and an outer end opposite to the inner end,

characterized in that

said pins (50, 52) comprise:

- at their inner end a ferrule (56) for contacting a respective ball (48) housed in a respective of said seating (40, 42), so as to allow a free rotation between said intermediate element (20) and said terminal elements (16, 18), and
- at their outer ends a head, in which a screwing seating (57) for a tool is made, so as to allow the independent screwing/unscrewing of each pin (50, 52) for regulating the position of the intermediate element (20) with respect to the two terminal elements (16, 18).

2. Hinge as in claim 1, **characterized in that** each of said seatings (40, 42) is internally lined with a lining (44) made of anti-wear material and able to contact the lateral surface of the corresponding pin (50, 52). 5
3. Hinge as in any claim hereinbefore, **characterized in that** each of said pins (50, 52) comprises a threaded portion (54) able to be screwed onto a mating cylindrical threaded seating (58) made inside the corresponding terminal element (16, 18). 10
4. Hinge as in claim 3, **characterized in that** it also comprises ring nuts (66, 68), or washers, able to be screwed into said cylindrical threaded seatings (58), and **in that** each of said pins (50, 52) comprises, in an opposite end to said first end (56), a screwing seating (57), and each of said ring nuts (66, 68) comprises a through screwing hole (70) with a longitudinal axis misaligned with respect to the longitudinal axis of said screwing seating (57). 15 20

Patentansprüche

1. Scharnier zum gelenkigen Lagern eines beweglichen Strukturelements (12), wie etwa eines Schließelements eines Rahmens oder Ähnlichem, bezüglich eines festen Strukturelements (14), wie etwa einer festen Struktur oder Ähnlichem, umfassend: 25

zwei Endscharnierelemente (16, 18), die an einem der Strukturelemente (12, 14) befestigt werden können;

ein Zwischenscharnierelement, das zwischen den zwei Endelementen (16, 18) angebracht ist und an dem anderen der Strukturelemente (14, 12) befestigt werden kann; und 35

eine Schwenkeinrichtung, mit der das Zwischenelement und die zwei Endelemente (16, 18) axial zueinander entlang der gleichen Schwenkachse (I) geschwenkt werden können; 40

wobei das Zwischenelement (20) umfasst:

eine einzelne zentrale Aussparung (32) mit einer im Wesentlichen senkrechten Ausrichtung bezüglich der Schwenkachse (I), wobei die Aussparung ein Regelungselement (34) aufnehmen kann, das wiederum in Zusammenarbeit mit dem strukturellen Element (14, 12), mit dem das Zwischenelement (20) zusammenwirkt, angeordnet werden kann und dahingehend betrieben werden kann, dass der Abstand zwischen dem Strukturelement (14, 12) und der Schwenkachse (I) verändert wird; 45 50

zwei auf einander bezüglich der zentralen Aussparung (32) gegenüberliegenden Seiten angeordnete Sitzelemente (40, 42) mit einer Aus-

richtung im Wesentlichen parallel zur Schwenkachse (I), wobei die Schwenkeinrichtung zwei Stifte (50, 52) umfasst, von denen jeder zu einem entsprechenden Endelement (16, 18) gehört und mit einem entsprechenden der Sitzelemente (40, 42) zusammenwirken kann, um die gelenkige Lagerung des beweglichen Strukturelements (12) bezüglich des festen Strukturelements (14) zu ermöglichen,

wobei die Stifte (50, 52) ein zum Zwischenelement (20) weisendes inneres Ende und ein dem inneren Ende gegenüberliegendes äußeres Ende umfassen,

gekennzeichnet dadurch, dass die Stifte (50, 52) umfassen:

eine Kappe (56) an ihrem inneren Ende zum Berühren jeweils einer im jeweiligen Sitzelement (40, 42) aufgenommenen Kugel (48), um so eine freie Rotation zwischen dem Zwischenelement (20) und den Endelementen (16, 18) zu ermöglichen, und

einen Kopf an ihren äußeren Enden, an dem ein Gewindesitz (57) für ein Werkzeug gebildet ist, um so das unabhängige Anschrauben/Ab-schrauben jedes Stifts (50, 52) zum Regeln der Position des Zwischenelements (20) bezüglich der zwei Endelemente (16, 18) zu ermöglichen.

2. Scharnier nach Anspruch 1, **gekennzeichnet dadurch, dass** jedes der Sitzelemente (40, 42) im Innern mit einer Fütterung (44) gefüttert ist, die aus Antiverschleißmaterial hergestellt ist und die Seitenfläche des entsprechenden Stifts (50, 52) berühren kann.

3. Scharnier nach einem der vorherigen Ansprüche, **gekennzeichnet dadurch, dass** jeder der Stifte (50, 52) einen Gewindeabschnitt (54) umfasst, der auf ein passendes zylindrisches Gewindesitzelement (58), das innerhalb des entsprechenden Endelements (16, 18) gebildet ist, geschraubt werden kann.

4. Scharnier nach Anspruch 3, **gekennzeichnet dadurch, dass** es auch Ringmuttern (66, 68) oder Scheiben umfasst, die in die zylindrischen Gewindesitzelemente (58) geschraubt werden können, und **dadurch, dass** jeder der Stifte (50, 52) ein Schraubsitzelement (57) an einem dem ersten Ende (56) gegenüberliegendem Ende umfasst und jede der Ringmuttern (66, 68) ein Durchschraubloch (70) mit einer Längsachse umfasst, die bezüglich der Längsachse des Schraubsitzelements (57) versetzt ist.

Revendications

1. Charnière pour articuler un élément structurel mobile (12), tel qu'un élément de fermeture d'un cadre ou équivalent, par rapport à un élément structurel fixe (14) tel qu'une structure fixe ou équivalente, comprenant :

- deux éléments terminaux de charnière (16, 18) aptes à être fixés à l'un desdits éléments structurels (12, 14),

- un élément intermédiaire de charnière monté entre lesdits deux éléments terminaux (16, 18) et apte à être fixé à l'autre desdits éléments structurels (14, 12), et

- des moyens pivotants aptes à pivoter axialement par rapport à chacun des autres dits éléments intermédiaires et dits deux éléments terminaux (16, 18) selon le même axe de pivotement (I);

ledit élément intermédiaire (20) comprenant :

- une unique cavité centrale (32) avec un développement sensiblement orthogonal par rapport audit axe de pivotement (I), et apte à recevoir un élément de réglage (34), qui à son tour est apte à être disposé en coopération avec l'élément structurel (14, 12), avec lequel ledit élément intermédiaire (20) coopère, et peut être actionné de façon à modifier la distance entre ledit élément structurel (14, 12) et ledit axe de pivotement (I); et

- deux sièges (40, 42), disposés de part et d'autre par rapport à ladite cavité centrale (32) et avec un développement sensiblement parallèle audit axe de pivotement (I), dans lequel lesdits moyens de pivotement comprennent deux broches (50, 52), chacune étant associée à un élément terminal correspondant (16, 18) et étant apte à coopérer avec l'un respectif desdits sièges (40, 42), de façon à permettre l'articulation dudit élément structurel mobile (12) par rapport audit élément structurel fixe (14),

dans lequel lesdites broches (50, 52) comportent une extrémité intérieure tournée vers l'élément intermédiaire (20) et une extrémité extérieure opposée à l'extrémité intérieure,

caractérisée en ce que lesdites broches (50, 52) comprennent :

- à leur extrémité intérieure un bout ferré (56) pour entrer en contact avec une bille respective (48) logée dans un desdits sièges respectifs (40, 42), de façon à permettre une rotation libre entre ledit élément intermédiaire (20) et lesdits éléments terminaux (16, 18), et

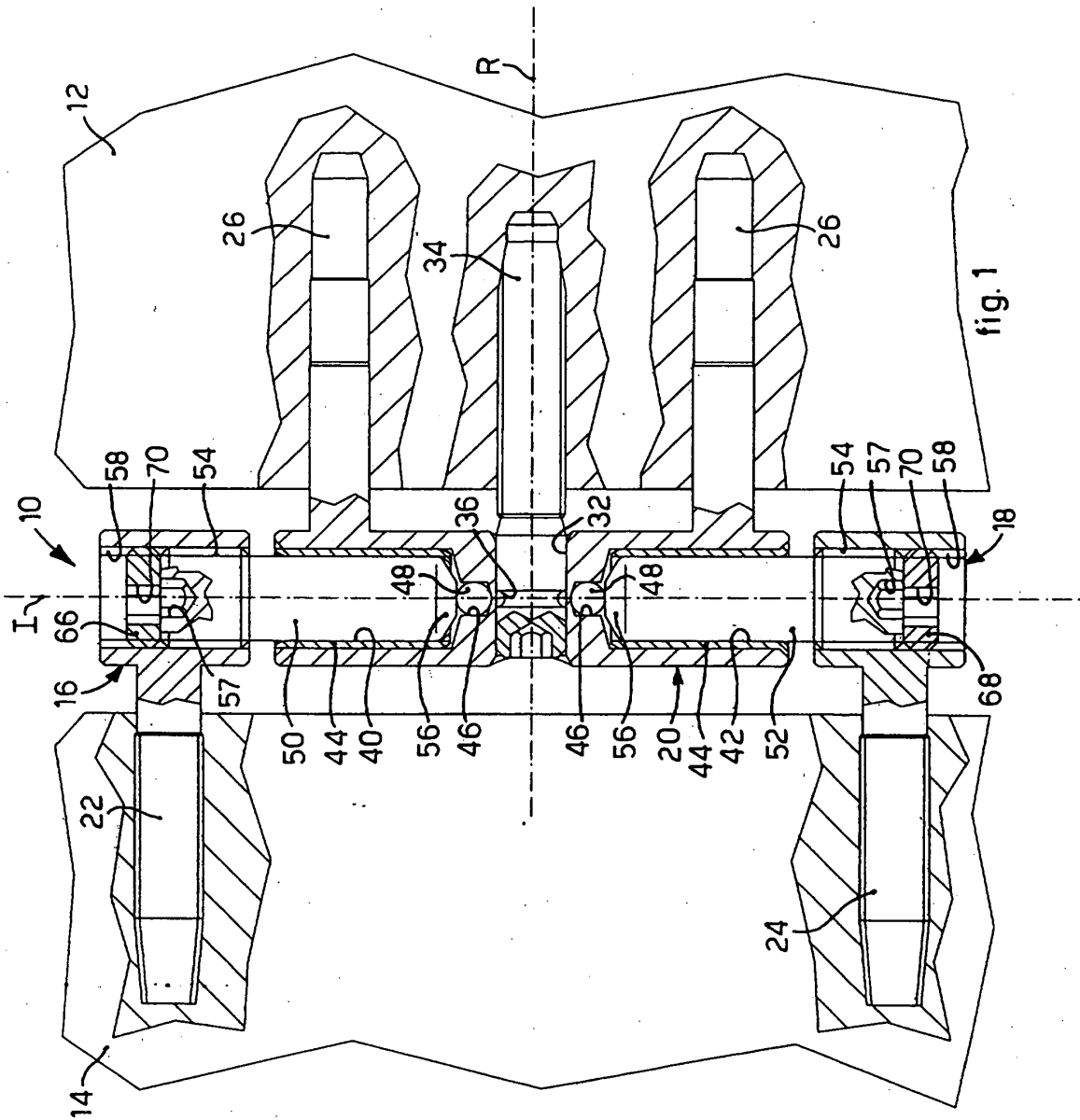
- à leur extrémité extérieure une tête, dans laquelle une empreinte de vissage (57) pour un

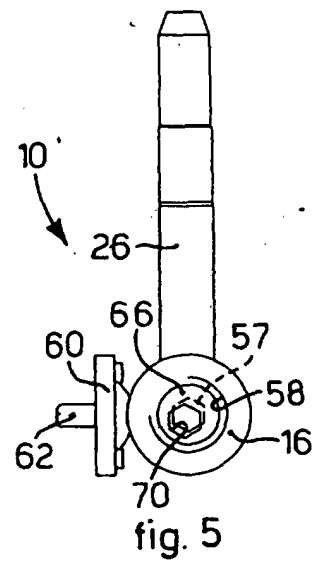
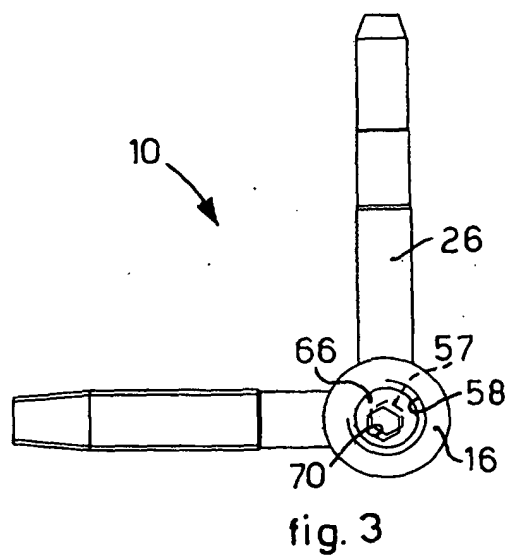
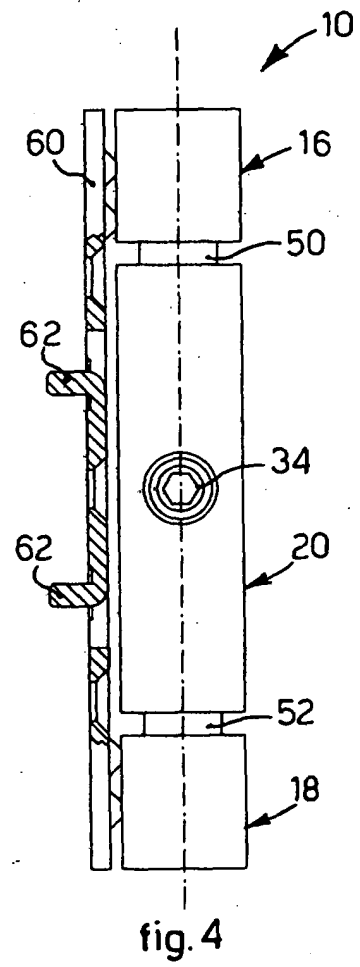
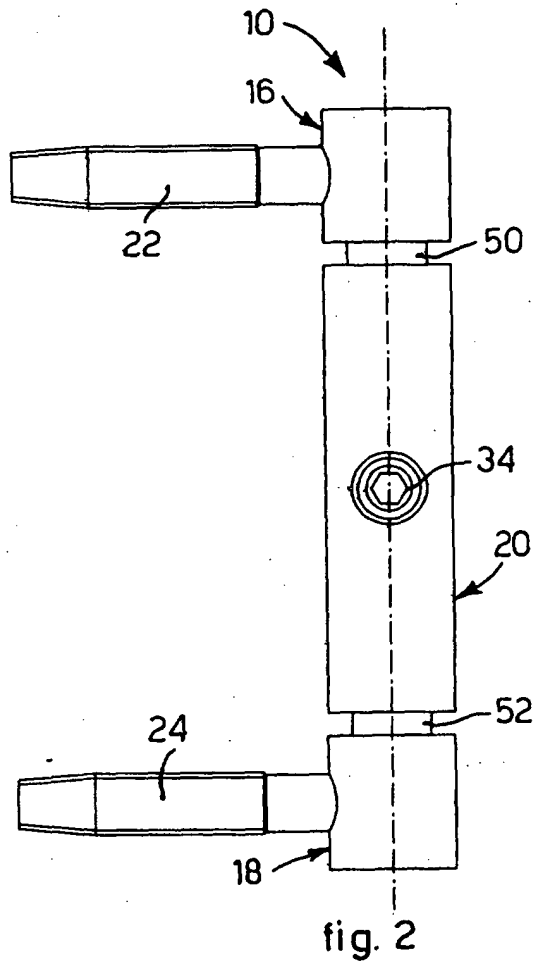
outil est prévue, de façon à permettre le vissage/dévisage indépendant de chaque broche (50, 52) pour régler la position de l'élément intermédiaire (20) par rapport aux deux éléments terminaux (16, 18).

2. Charnière selon la revendication 1, **caractérisée en ce que** chacun desdits sièges (40, 42) est revêtu intérieurement par un revêtement (44) composé d'un matériau anti-usure et apte à entrer en contact avec la surface latérale de la broche correspondante (50, 52).

3. Charnière selon l'une quelconque des revendications précédentes, **caractérisée en ce que** chacune desdites broches (50, 52) comprend une portion filetée (54) apte à être vissée dans un siège fileté cylindrique adapté (58) réalisé à l'intérieur de l'élément terminal correspondant (16, 18).

4. Charnière selon la revendication 3, **caractérisée en ce qu'elle** comprend en outre des écrous à oeil (66, 68) ou des rondelles, aptes à être vissées dans lesdits sièges cylindriques filetés (58), et **en ce que** chacune des dites broches (50, 52) comprend, à une extrémité opposée à ladite première extrémité (56), une empreinte de vissage (57), et chacun desdits écrous à oeil (66, 68) comprend un trou vissant traversant (70) avec un axe longitudinal non aligné par rapport à l'axe longitudinal de ladite empreinte de vissage (57).





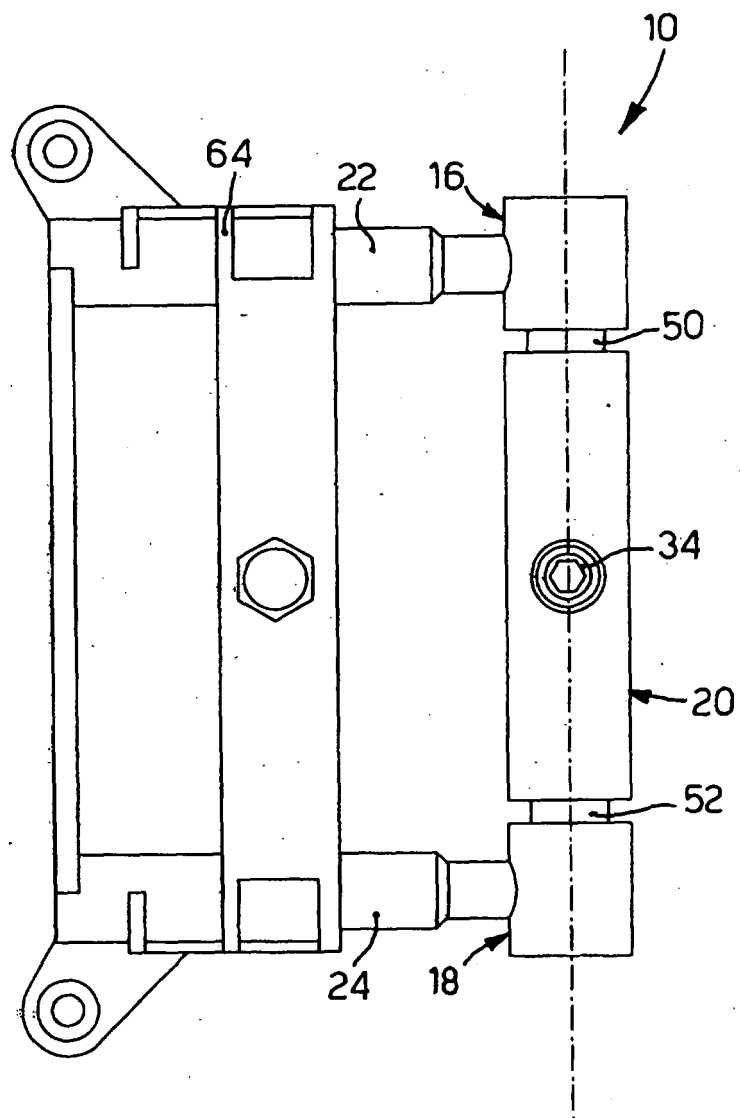


fig. 6

REFERENCES CITED IN THE DESCRIPTION

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