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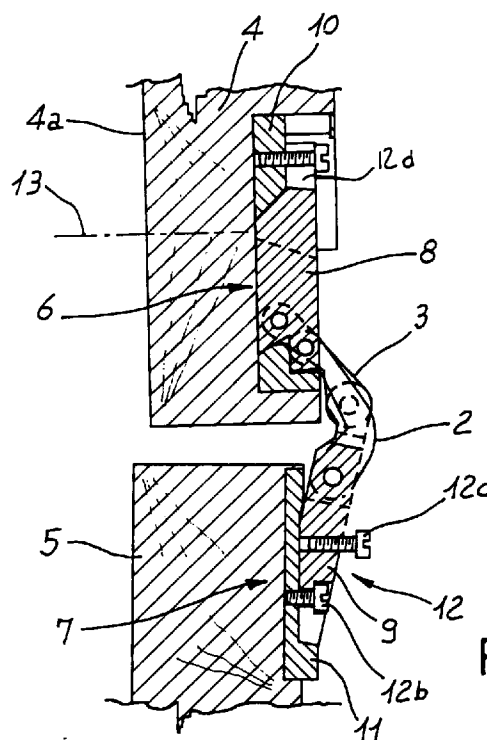
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(54) **A hinge junction device, in particular for wardrobe and cabinet doors**

(57) A hinge junction device is provided, in particular for wardrobe and cabinet doors, comprising at least two rocking rods (2, 3) and two attachment sets (6, 7) to be connected to a door (4) and a post (5), respectively. Each attachment set (6, 7) is provided with a support body (10, 11), an engagement portion (8, 9) interposed between the support body and hinging ends of the rocking rods, and connecting and adjusting means (12) interposed between the support bodies (10, 11) and the corresponding engagement portions (8, 9).



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Description

The present invention relates to a hinge junction device, in particular for wardrobe and cabinet doors.

It is known that hinge junction devices for wardrobe and cabinet doors or similar furniture components can each comprise at least two rocking rods hinged on appropriate attachment elements in turn connected to a door or a post.

Practically these rocking rods, in addition to supporting the weight of a door, define an appropriate opening and closing trajectory for the door itself, characterized by a non-fixed but varying rotational axis which enables both to make the door abut against the post edges when it is in a closed position and to form a very wide opening angle of the door, even wider than 90°.

In the hinge junction devices of known type, the mentioned attachment elements are directly connected not only to a door or a post, but also to the ends of said rocking rods. These attachment elements therefore must have a shape adapted both for anchoring to the door and the post, and for enabling articulation with the rocking rods, and they are made of a material of appropriate workability and mechanical-strength features.

According to the normally adopted technical solution for making the above described attachment elements, the same are obtained from steel material or non-ferrous metal alloys of the same type as employed for rocking levers.

Use of the same material for all components of the hinge junction device involves that all said components must have the same surface hardness, in particular at the mutual-contact regions. Sliding friction between materials of the same hardness may be consistent and therefore quick wear at the critical contact regions may occur, which will reduce reliability, precision in movements, and ultimately the useful lifetime of known devices.

In addition, production of attachment elements of complicated form is expensive, because in this case also appropriate moulds of same complexity are required, for example.

Use of the same material for all components also represents a rigid constraint in selecting the production processes and it reduces the attainable precision degree.

Finally, it is to point out that interposition of a single attachment element between the rocking rods and the door or post greatly reduces the positioning-adjustment possibilities of the door relative to the post, during both the opening and closing steps. In fact, for the purpose it is necessary to carry out a direct change of the anchoring position of the attachment elements themselves to the piece of furniture.

Under this situation, the technical task underlying the present invention is to provide a hinge junction device capable of substantially overcoming the mentioned limits.

Within the scope of this technical task, it is an important aim of the invention to provide a hinge device which is reliable as regards duration of life, and precise in operation and which enables a wide and easy adjustment of a door positioning relative to a wardrobe or cabinet post, during both the opening and closing steps.

Another important object of the invention is to provide a device of reduced production costs and adapted to be made with simple and quick manufacturing cycles.

The technical task mentioned and the aim specified are substantially achieved by a hinge junction device in accordance with the appended claims.

Description of two preferred, non-exclusive embodiments of a hinge junction device in accordance with the invention is now given hereinafter by way of non-limiting example, illustrated in the accompanying drawings, in which:

- Fig. 1 shows a plan section of a first embodiment of a device applied to a post and a door in a closed position;
- Fig. 2 shows the device of Fig. 1 in the open position of a door;
- Fig. 3 is a plan section of a second embodiment of a device in accordance with the invention, applied to a post and a door in a closed position;
- Fig. 4 shows the device of Fig. 2 in the open position of a door;
- Fig. 5 is a plan section of a first support body and a first hinging element of the device shown in Figs. 3 and 4, adapted for mutual mating;
- Fig. 6 is a plan section of a first support body and a first hinging element of the device shown in Figs. 1 and 2, adapted for mutual mating;
- Fig. 7 is a diagrammatic front view of a second hinging element both of the device shown in Fig. 1 and of that shown in Fig. 3;
- Fig. 8 is a section taken along plane VIII-VIII in Fig. 7;
- Fig. 9 is a front view of a second support body for both the device in Fig. 1 and the device in Fig. 3; and
- Fig. 10 shows a section taken along plane X-X in Fig. 9.

With reference to the drawings, the junction device in accordance with the invention has been generally identified by reference numeral 1.

It comprises one or preferably two pairs of two rocking rods 2 and 3, made of a steel material for example, adapted to support a door 4 and to define the opening and closing trajectories of door 4 relative to a post 5 of a wardrobe or similar piece of furniture (in the following wardrobe).

The rocking rods 2 and 3 are interposed between a first attachment set 6, connected to door 4 for example (as in the accompanying figures) or also to a post 5, and a second attachment set 7, to be connected to post 5 for

example or also to door 4.

The attachment sets 6 and 7 respectively comprise a first portion 8, defined by a first hinging element, for engagement with respective ends of the rocking rods 2 and 3, and a second portion 9, defined by a second hinging element, for engagement with opposite ends of the rocking rods 2 and 3.

In greater detail, the rocking rods 2 and 3 are defined by levers of reduced vertical overall dimensions (thickness) and are disposed and move in respective parallel, preferably horizontal, lying planes, vertically offset relative to each other. This ensures reduced overall dimensions and eliminates all interference problems during movement.

It is also to point out that the two levers 2 and 3 practically form a four-bar linkage so that the door can move relative to the post according to an instantaneous motion which is rotatory about a (vertical) axis defined by the intersection of the vertical plane containing the straight line passing by the hinging points of the rod or rocking lever 2 with the vertical plane containing the straight line passing by the hinging points of the rod or rocking lever 3.

By virtue of the fact that the two rods are vertically offset, they univocally define the rotation axis of the door. It is therefore apparent that by using two suitably spaced part hinge devices 1 it will be possible to obtain an undoubtedly great steadiness and accuracy in the rotatory motion.

It is also to point out that preferably device 1 comprises two rocking rods 2 and two rocking rods 3 disposed symmetrically relative to a horizontal axis of symmetry 1a of the whole device 1.

In this way steadiness and accuracy in rotation appear still more marked.

It is to note that the structure of device 1 and in particular of the first and second hinging elements 8, 9, is, in an assembled condition, symmetric relative to said horizontal axis 1a.

In accordance with a further aspect of the invention, the first and second hinging elements (engagement portions 8 and 9) are shiftable from the open condition in which they are spaced apart from each other, to the closed condition in which they are at least partly nested into each other thereby greatly reducing the overall dimensions of device 1.

The first and second hinging elements 8 and 9 are originally made up of a material having a different, preferably lower, hardness than the material of the rocking levers. If the latter are made of steel, advantageously the hinging elements are of an easily and precisely workable material, such as brass or aluminium.

In addition, the attachment sets 6 and 7 comprise a first support body 10 and a second support body 11 respectively, to be engaged to door 4 and post 5 by anchoring means, defined by lag screws for example, and connecting and adjusting means 12 interposed between the support bodies 10 and 11 and the corre-

sponding hinging elements 8 and 9.

More specifically, the first support body 10 has a base face 10a oriented vertically in an operating position and adapted to be coupled with a corresponding surface of a hollow formed in door 4, and mating regions 10b located in vertical planes inclined to the base face 10a and adapted for coupling with mating edges 8a of the first hinging element 8.

Practically, inclination of edges 8a and of the mating regions 10b enables an easy engagement or disengagement by sliding between the first support body and the first hinging element 8. Advantageously, inclination of edges 8a also enables a variation in the mutual position between the first support body and the first hinging element, with possibility of locking by means of a fastening and adjusting screw 12a.

It is to note that screw 12a operates at a slot 12d formed in the hinging element 8, so as to enable a translation of element 8 itself in a direction parallel to the inclined vertical planes defined by regions 10b and the corresponding edges 8a. Practically, during adjustment of the portion of element 8 with respect to the support body 10, slot 12d undergoes a displacement relative to the fastening screw 12a.

In a first embodiment, shown in Figs. 1, 2 and 6, the first support body 10 has a substantially flattened conformation and can be secured to door 4 by lag screws oriented according to an anchoring axis 13 transverse to the main face 4a of door 4.

In a second embodiment, shown in Figs 3, 4 and 5, the first support body 10, seen in top view in an operating position, has a right-angled conformation defining two base faces 10a and 10c transverse, preferably orthogonal, to each other and to be coupled by a right-angled matching hollow for example, formed in door 4.

In this second embodiment, the lag screws constituting the anchoring means to the door are also disposed at the base face 10c which is transverse to the main face 4a of door 4 and therefore are oriented according to an auxiliary anchoring axis 14 parallel to the main face 4a itself. In this second embodiment the first support body 10 is very steadily connected to the door, also due to the fact that very long screws can be employed along the auxiliary anchoring axis 14, in spite of the particular conformation of the door edge region.

The second support body 11 is defined by a base disk of partly circular conformation to be fitted in a matching seat formed in post 5.

Susceptible of engagement with the base disk 11 is the second hinging element 9 which, in addition to being provided with fork-shaped seats 9a for the ends of the rocking rods 2 and 3, also has an anchoring slot 9b which, in an operating condition, extends along a predetermined, preferably vertical, axis 9c. The connecting and adjusting means of the second hinging element 9 comprises a main connecting and adjusting screw 12b to be locked to a predetermined position of slot 9b, which enables adjustment of the door in a vertical plane.

More specifically, the slot 9b has a longitudinal extension axis 9c along which the relative movement of the screw 12b can take place, thereby obtaining the possibility of latch-like moving the second hinging element 9 relative to the second support body 11 (i.e. with a movement involving up and down sliding).

The connecting and adjusting means of the second hinging element 9 also comprises an auxiliary adjusting screw 12c having a thrust end abutting against the base disk 11 which enables the second hinging element itself to be locked to a predetermined and varying distance from the base disk in a horizontal direction.

The invention achieves important advantages.

First of all the presence of attachment sets, each comprising two components, for connection to the door and the post enables the materials of same to be easily diversified in respect of those of the rocking rods, and the production cycles of the whole device to be optimized.

For example, the support bodies can be made of aluminium or other non-ferrous material alloys by adopting die-casting processes. The hinging elements can be made of brass and submitted to a quick and precise mechanical working. The rocking rods may consist of steel elements obtained by a quick cutting-out operation. In this manner the overall production costs are consequently greatly reduced.

The surface hardness of the rocking rods may be different from that of the hinging elements and this enables frictions and wear of the regions intended for sliding on each other to be reduced.

Furthermore, the connecting and adjusting means interposed between the support bodies and relative hinging elements enables the door position to be easily and quickly adapted to the post during both the closing and opening steps.

Finally, the above-described second embodiment of the support body to be coupled with a door enables a particularly strong anchoring to be made, which anchoring is therefore very reliable and durable also in case of rather heavy doors.

Claims

1. A hinge junction device, in particular for wardrobe and cabinet doors, comprising:

- at least two rocking rods (2, 3) defining an opening and closing trajectory for a door (4) relative to a wardrobe post (5);
- first and second attachment sets (6, 7) to be connected to said door and said post respectively, said rocking rods (2, 3) being operatively interposed between said attachment sets, characterized in that at least one of said first attachment set and second attachment set comprises:
- a support body (10; 11);

- an engagement portion (8; 9) interposed between the support body and engagement ends of said rocking rods; and
- connecting and adjusting means (12) interposed between the support body itself (10; 11) and the corresponding engagement portion (8; 9).

2. A device as claimed in claim 1, characterized in that each of said attachment sets (6, 7) comprises a support body (10, 11), means for anchoring said support body to said door (4) or said post (5) and connecting and adjusting means (12) interposed between said support body and the respective engagement portion (8, 9).

3. A device as claimed in claim 2, characterized in that said attachment sets (6, 7) comprise a first attachment set (6) formed of a first engagement portion (8) and a first support body (10) having at least one base face (10a) oriented vertically in an operating position and susceptible of coupling with said door (4) or said post (5), and in that said first engagement portion (8) and first support body (10) have mutual mating edges and regions (8a, 10b) disposed in vertical planes, inclined to said base face (10a).

4. A device as claimed in claim 3, characterized in that said first support body (10), seen from top in an operating position, has a right-angled conformation defining two base faces (10a, 10c) transverse, preferably orthogonal, to each other, susceptible of coupling with a mating hollow formed in said door or in said post.

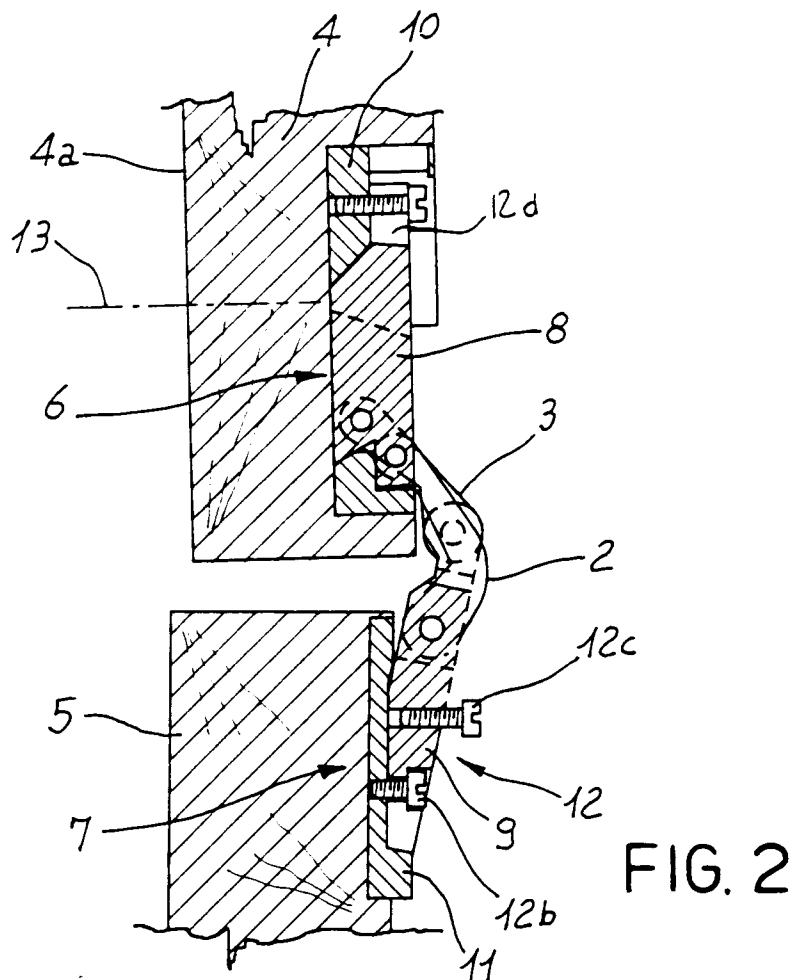
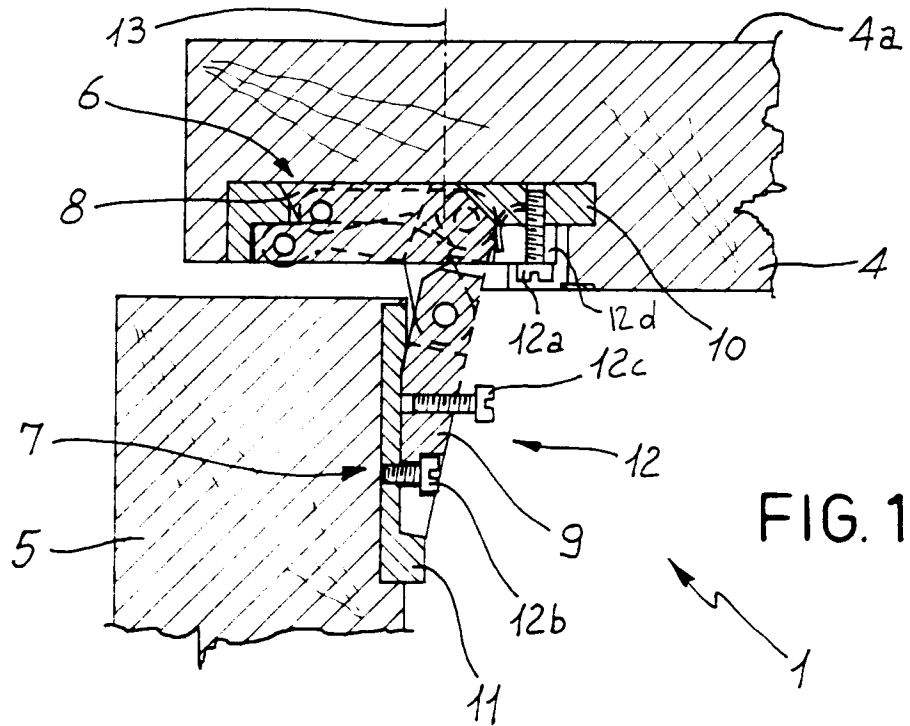
5. A device as claimed in claim 4, characterized in that said anchoring means between said first support body and door or post can be disposed so as to be oriented parallelly of the main faces of said door (4) or post (5).

6. A device as claimed in claim 2, characterized in that said attachment sets (6, 7) comprise a second attachment set (7) formed of a second engagement portion (9) and a second support body (11) defined by a base disk to be fitted in a mating seat formed in said post (5) or said door (4).

7. A device as claimed in claim 6, characterized in that said second engagement portion (9) has an anchoring slot (9b) that in an operating position extends along a preferably vertical predetermined axis (9c), and in that said connecting and adjusting means comprises at least one main connecting and adjusting screw (12b) to be locked to a predetermined position of said slot.

8. A device as claimed in claim 7, characterized in that the connecting and adjusting means further comprises an auxiliary adjusting screw (12c) adapted to lock said second engagement portion to a varying distance from said second support body in a horizontal direction. 5
9. A device as claimed in claim 7, characterized in that said attachment sets comprise respective portions for engagement with said rocking rods, consisting of a material of a hardness different from that of the material forming the rocking rods. 10
10. A device as claimed in claim 1, characterized in that the rocking rods (2, 3) are defined by levers of reduced vertical overall dimensions disposed and movable in respective parallel, preferably horizontal, lying planes vertically offset from each other. 15
11. A device as claimed in claim 10, characterized in that the rocking rods or levers (2 and 3) embody a four-bar linkage so as to define a displacement of the door (4) relative to the post (5) according to an instantaneously rotatory motion about an axis defined by intersection of the vertical plane containing the straight line passing by the hinging points of the rocking rod (2) with the vertical plane containing the straight line passing by the hinging points of the rocking rod (3). 20 25
12. A device as claimed in claim 1, characterized in that it comprises two rocking rods (2) and two rocking rods (3) disposed symmetrically to a horizontal axis of symmetry (1a) of the whole device (1). 30
13. A device as claimed in claim 1, characterized in that the first and second engagement portions (8 and 9) are shiftable from a condition in which they are spaced apart from each other, corresponding to the open condition of the door, to a position in which they are at least partly nested into each other, in the closed condition of the door. 35 40
14. A device as claimed in claim 3, characterized in that it comprises a screw or another fastening member (12a) operating at a slot (12d) formed in the first engagement portion (8), so as to enable a translation of said engagement portion (8) in a direction parallel to the inclined vertical planes defined by the regions (10b) and the mating edges (8a). 45 50

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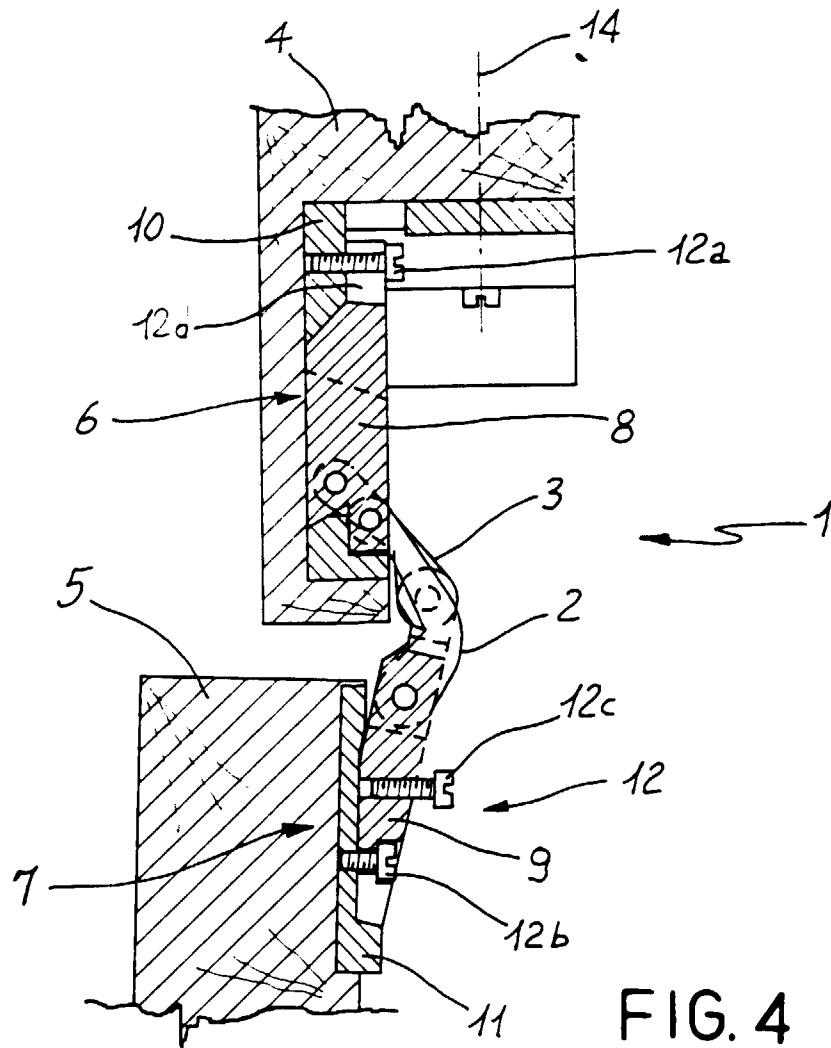
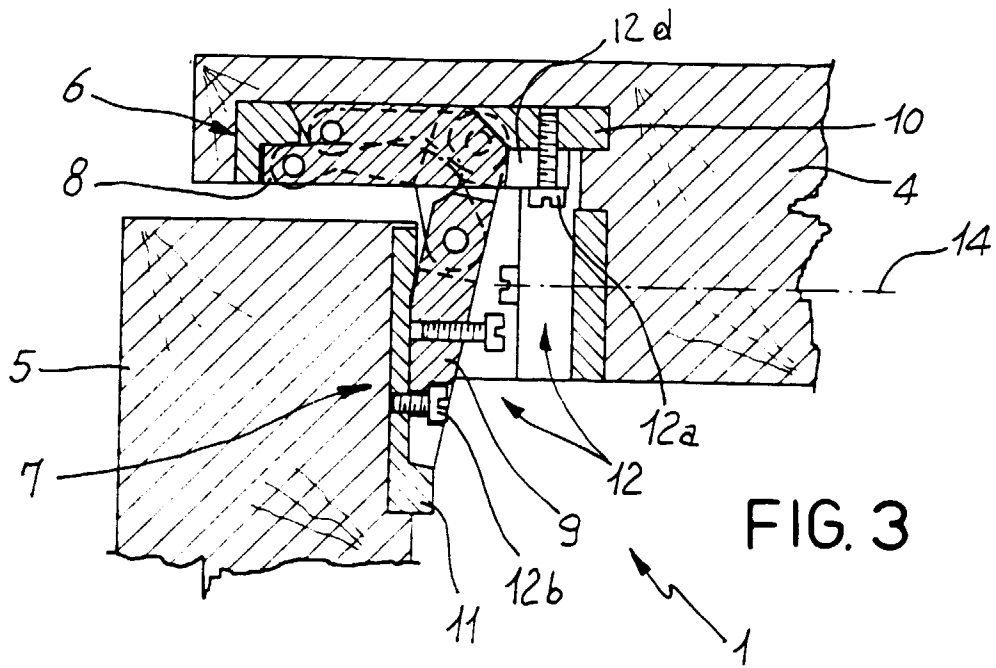


FIG. 5

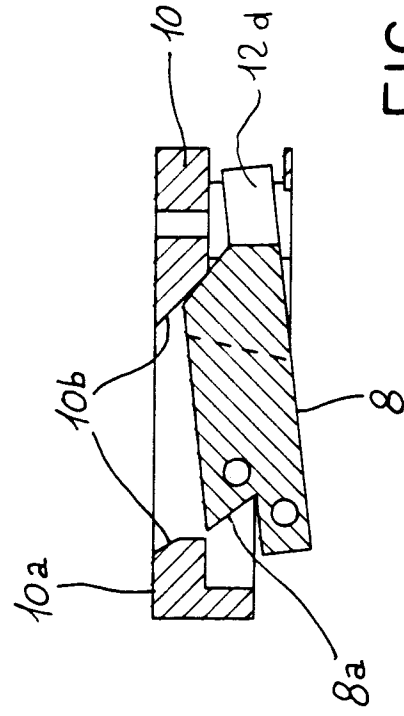
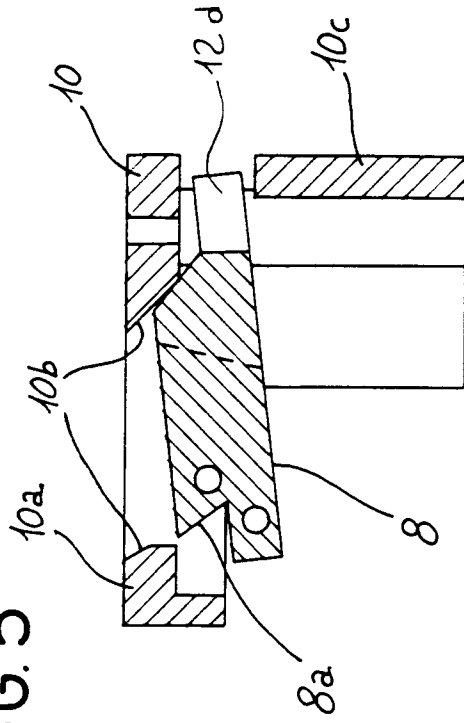


FIG. 6

FIG. 7

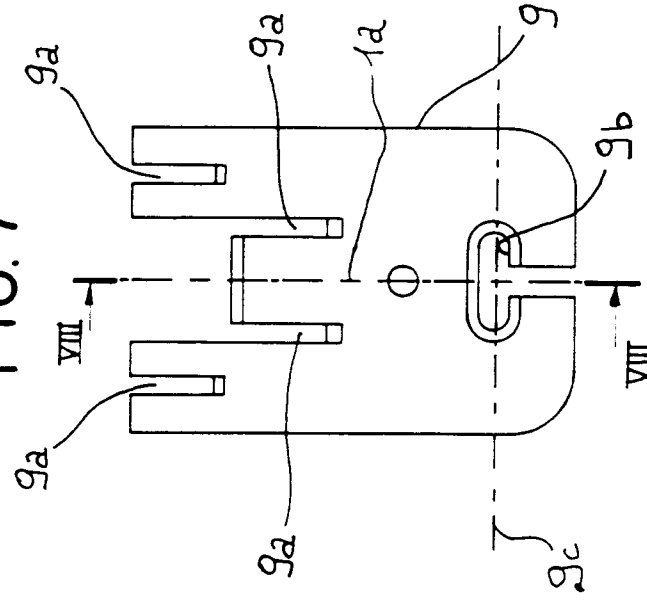


FIG. 8

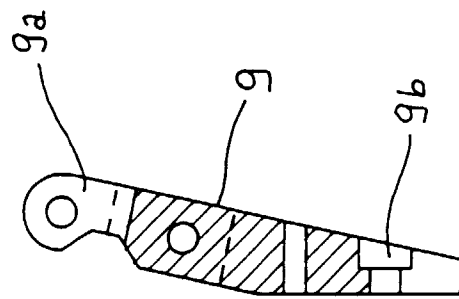


FIG. 9

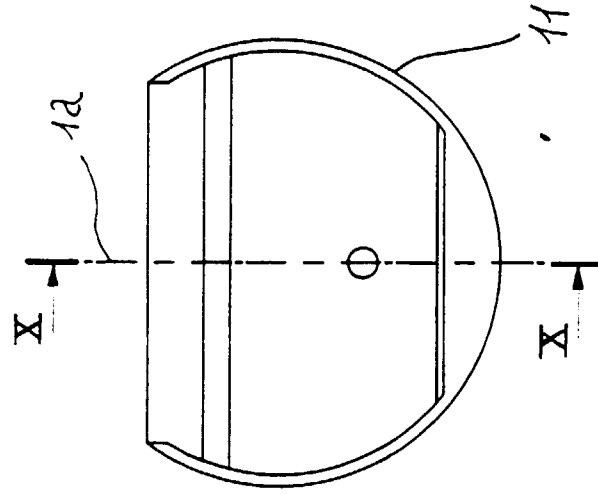
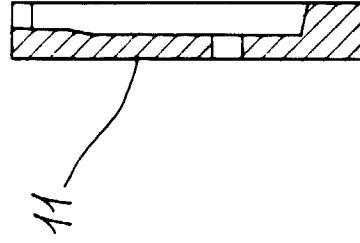


FIG. 10





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 98 10 9331

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X A	DE 28 39 576 A (PRÄMETA) 20 March 1980 * page 9, line 6 - line 19; figures * ---	1,13 8	E05D7/04 E05D5/08 E05D7/12
X Y A	DE 23 53 043 A (BLUM) 20 June 1974 * page 4, last paragraph - page 5, line 3; figures * ---	1,10,11, 13 2,6,7 4	
Y A	DE 295 00 886 U (PRÄMETA) 2 March 1995 * page 5, last paragraph - page 6, paragraph 2; figures * ---	2,6,7 4	
A	DE 28 06 958 A (BLUM) 31 August 1978 * page 15, last paragraph * -----	3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E05D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 6 August 1998	Examiner Van Kessel, J
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