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(54) **Hinge for position adjustment of backs, arm rests and various movements in divans and beds**

(57) It is proposed a hinge with many adjustment positions for backs, arm rests and various movements in divans and beds, made up of a drilled plate with hole layout supplied with teeth for obtaining the fastening in

various tilt positions and with two cam plates and counteracting teeth of the same toothed plate, and with fastening holes for bolts for obtaining the connection of various plates in the packet form that are then closed in a common case.

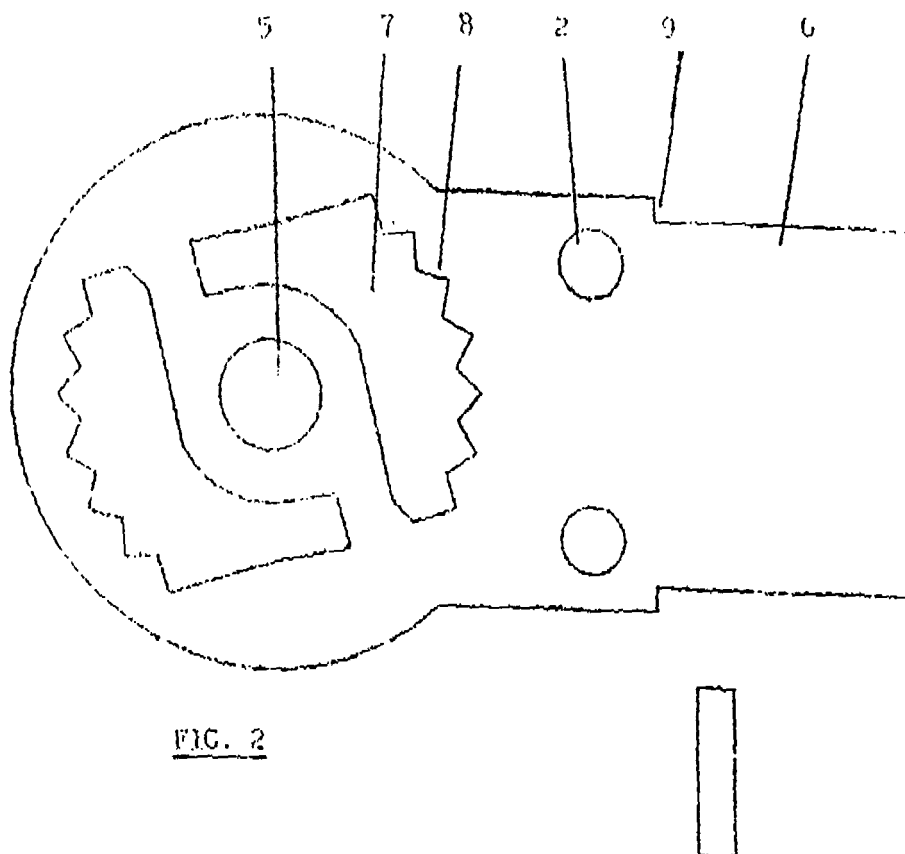


FIG. 2

EP 1 880 638 A1

Description

[0001] The object of this invention is to supply a hinge for divans or beds or deck-chairs and the like, that improves the existing hinges of previous technics.

[0002] The actual market situation related to click hinges to be used in arm rests or backs of beds and divans that can be transformed in bed applies different solutions. These solutions have different dimensions and can be adapted to structures made of iron pipes, usually with dimensions 30x30x1,5 mm, or 30x20x1,2 mm. But these solutions have some limits that reduce the use field of each of these to well established applications, In fact there are known click hinges made with sheets of ferrous materials that allow an adjustment with 30° steps, but have a mechanical resistance limited and insufficient for usual backs. Further its mechanism is not easily accessible for the phases of formation of foam internal material and painting, that are typical of this sector of stuffed furniture, and further they are antiaesthetic.

[0003] There are known hinges made of sintered steel that are closed with respect to external ambient, guaranteeing in this manner a good sealing and a good mechanical resistance. But the material forming them is not sufficiently resistant, therefore they are subject to easy breakage in case of shocks and strokes and further they have an imperfect welding to its frame.

[0004] Other solutions are on the contrary cumbersome and have a limited mechanical resistance as they are made of iron that is rapidly worn by use.

[0005] The considered hinge is made up of sheet packets with a central pin around which it is assembled an engagement mechanism that is symmetrical with respect to the pin. A side holds a sheet packet having a smooth structure, in which it is installed a plate spiral that keeps in position a toothed steel element, that will be located in the hollow space having racket teeth belonging to counteracting plates. These last plates are located over and under the above mentioned packet in variable number for modulating the resistance and the cost of the same hinge.

[0006] At one end or at the other end of the toothed plate there are foreseen cam plates, that in case of release allow the lock tooth to be located onto a step of the profile of central plates so that it is disengaged owing to the pressure of the flat spring located in the central spring packet with respect to counteracting plates and allows that the hinge returns to the initial position. In the same manner it is foreseen in the end another cam that brings again in position the lock tooth so that it returns to engage the racket tooth mechanism.

Advantages of the invention

[0007] This invention is provided to solve all of problems of the sector of click hinges for divan-beds and the like, guaranteeing at first a good liquid impermeableness as the mechanism it waterproof. Further as it has a double

mechanism symmetrical with respect to the central pin, it guarantees a resistance to loads greatly higher than the solutions actually in commerce. Another good advantage of the mechanism forming the patent object is its modularity. In fact its laminar structure allows to change in a simple manner the number of sheets for changing the hinge resistance load, in this manner it is suitable both for overall dimensions and for load limit according to all of necessities. Further, as the mechanism is located near the central pin, it allows to change at will the hinge forms making possible the adaptation to external dimensions of each pipe or fastening.

[0008] Another advantage of the invention is the possibility to change simply a plate type allowing to obtain mechanisms with a variable number of positions (from 1 to 7), with pitch variable from a position to the other one (15°, 20°, 30°) and also to change the positions for complete engagement and disengagement along 360°, allowing to obtain in this manner hinges that stand mechanical torques applied in clockwise direction or anti-clockwise direction.

[0009] In the following there are shown in detail the characteristics of the invention with reference to annexed figures, that show:

- Figure 1 a manoeuvre plate made of sheet with stop hollow spaces of the device;
- Figure 2 a central plate with toothed hollow spaces for adjusting the hinge in different positions;

[0010] The Figure 1 show a stop end element 1 of the hinge with insertion holes 2 for two pins for connecting to plate packet and a central hole 5 for the central pin (not shown) and the two holes 3 shaped in cam form with stop tooth 4 for disengaging the hinge in an established position. Adjusting suitably this element it can be obtained a rest position or a work position by the counteracting action of internal spring.

[0011] The central plate 6 is supplied with the same hole elements of the plate 1, but with shaped holes 7 with teeth 9 for allowing the device adjustment in various positions shifted of few degrees with one another, for example of 5-10 degrees for each click or similar ones.

[0012] Naturally some of these central and peripheral elements for making a real hinge that has an external case made of formed metallic material that encloses these elements and further a spiral spring located in the centre, to which there are joined the stop teeth to be engaged with teeth 4 and 8. The spring is used, as usually, for avoiding the disengagement of teeth with respect to stop tooth elements, normally used in these devices.

[0013] The external teeth 9 are used for the connection to the external case for obtaining a compact packet and that cannot be disassembled easily from the various employed plates. According to necessities it is possible to use different numbers of plate elements, then according to the matter that the hinge is used in a easy-chair, a deck-chair or divan that have different weights and then

they have different load necessities.

[0014] Although this invention was described with reference to its particular embodiments, many other variants and modifications and other uses are evident to the persons skilled of technics. Therefore it is preferred that this invention is not limited by the specific supplied description, but only by the annexed claims. 5

Claims 10

1. Hinge with many adjustment positions for backs, arm rests and various movements in divans and beds, made up of a series of drilled plates with hole layout supplied with internal teeth for obtaining the fastening in various different tilt positions and with fastening holes for bolts for obtaining a connection of various plates in the packet form, that are then closed in a common case. 15
2. A hinge according to claim 1, **characterized in that** it has a stop plate with many crown teeth that allow to stop a back in various positions spaced of 10° or greater angle for each tooth and has one or more lateral stop plates fixed for counteracting the above mentioned plate with a pawl tooth pushed by a spiral spring for this plate and that can be adjusted in various positions, the packet of said plates being closed by an external case. 20 25
3. A hinge according to claim 1, **characterized in that** at one end or at the other end of tooth mechanisms there are foreseen cam mechanisms that, in case of disengagement, allow to locate the lock tooth onto a step of the hollow space of central plates so that it is disengaged owing to the pressure of plate spring located in the packet of central springs with respect to teeth of counteracting plates and allows that the hinge returns in the start position, and further **characterized in that** it is foreseen in another end another cam that locates again the central tooth so that it returns to engage the racket teeth mechanism. 30 35 40

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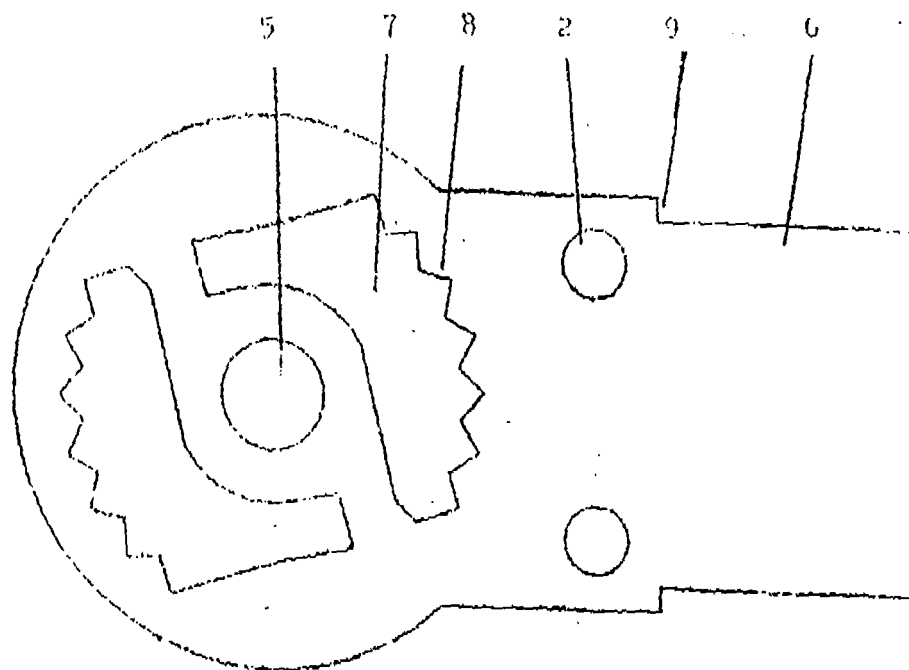


FIG. 2

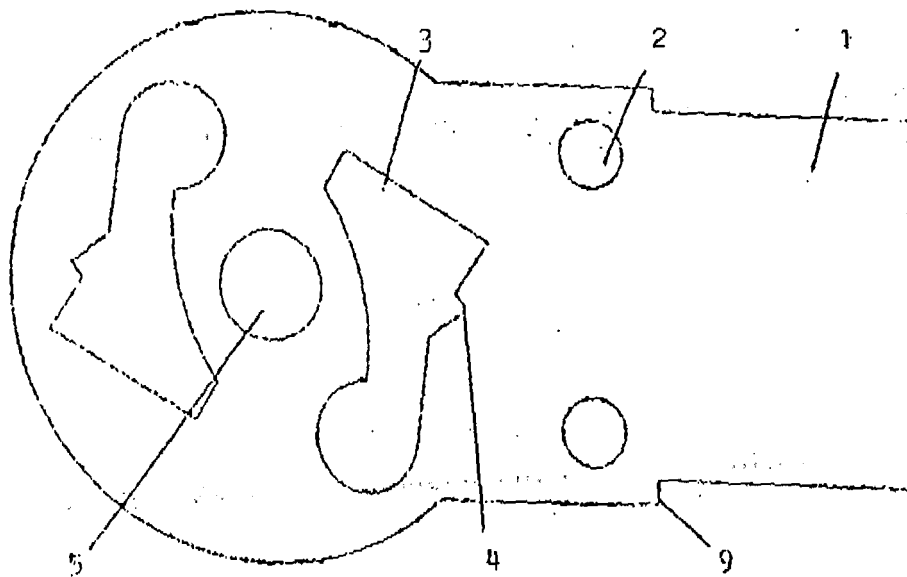


FIG. 1



European Patent
Office

EUROPEAN SEARCH REPORT

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 October 2007	Examiner Cardan, Cosmin
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 06 02 3518

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