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(54) **A device with braked arms for furniture doors**

(57) A device (10, 110) with articulated arms for the braked movement of a furniture door comprises two arms (11, 12) pivotally mounted on each other through a braked joint (13) and two fastening plates (14, 15) adapted to be secured to the piece of furniture and the furniture door, respectively. Each plate (14, 15) comprises a projecting pivot pin (16, 17, 116) and each arm has a through seat (21, 22, 121) that is open and provided with apertures on opposite sides of the arm to receive the projecting pivot pin and enable mounting of either plate indiffer-

ently, on each arm. In this way, the device can be adapted so as to be of the right-hand or left-hand type, at choice. Snap means is present between the seat and pivot pin for axial locking of the pivot pin into the seat and each pivot pin comprises a rotation bush (23, 24, 123) that is such shaped as to make unidirectional the possibility of full axial introduction of the pivot pin into the seat as far as fitting of the snap means, so as to be able to always identify the correct seat aperture for introduction of the pivot pin into the seat itself.

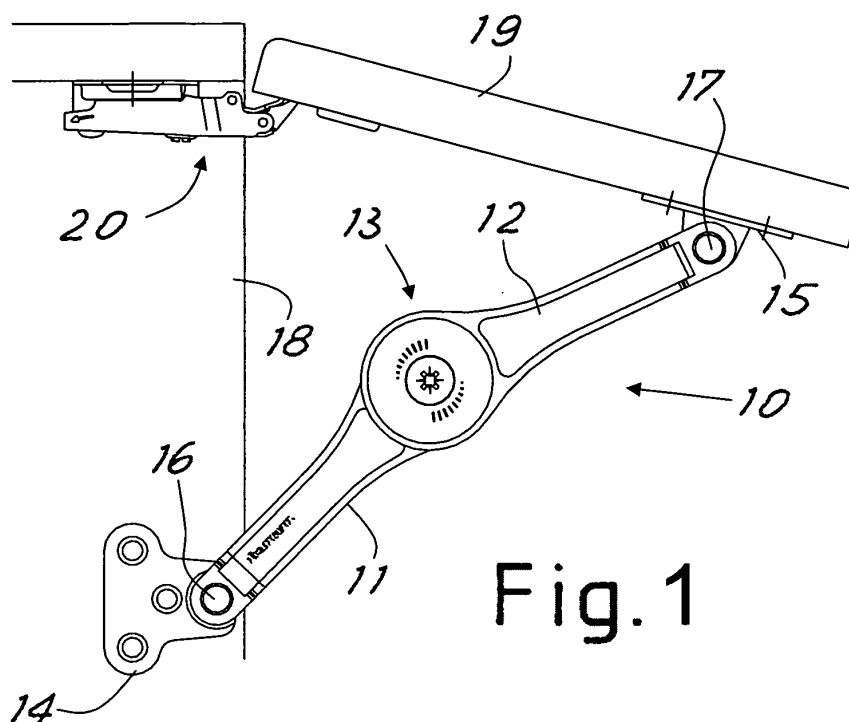


Fig. 1

Description

[0001] The present invention relates to a device with braked arms of the type designed for mounting between a furniture door and a piece of furniture to enable braked movement of the door.

[0002] Devices for furniture are known which are composed of a pair of arms pivotally mounted on each other by a braked joint (generally consisting of a clutch and a one-way release system). The free ends of the two arms are in turn pivotally mounted on plates for mounting on the piece of furniture and the door. If such a device is mounted on furniture with a vertically-opening door, the braked joint suitably disposed generates a torque balancing the door weight so that the door position is maintained sufficiently steady during the whole movement interval.

[0003] When the device is installed on the piece of furniture, a right-hand mounting or left-hand mounting may be required. For instance, generally mechanisms of this type are mounted in pairs on the right and left sides of the piece of furniture so as a higher braking moment can be utilized and, above all, unbalancing of the door that would occur in case of mounting on one side alone is avoided.

[0004] The optimal solution is that enabling use of the same model of device for both sides, without being obliged to provide a "right-hand" model and a "left-hand" model. Unfortunately, for construction reasons it is practically impossible to manufacture a device with a braked-opening arm having a perfect mirror symmetry. In addition, the mounting parts that are mounted to the right and to the left must have opposite insertion directions. Also the traditional adjusting screw of the braking torque that is usually in the middle of the pivot portion of the two arms must always face the furniture inside.

[0005] Therefore arms have been proposed that have systems for coupling to the door and furniture which enable the device to be suitably overturned depending on whether a right-hand mounting or left-hand mounting is required. With these systems however a mounting mistake can easily take place such as a reversed mounting of the articulated arm. Due to the structure of these devices, a wrong mounting can even pass unnoticed until an uncontrolled turning over of the door to the wrong side occurs.

[0006] It is a general aim of the present invention to obviate the above mentioned drawbacks by providing a device with braked arms that is easily adaptable for being of the "right-hand" or "left-hand" type at choice, while reducing to the minimum the possibilities of carrying out mounting in the reversed position.

[0007] In view of this aim, in accordance with the invention a device with articulated arms for the braked movement of a furniture door has been conceived which comprises two arms pivotally mounted on each other through a braked joint and two fastening plates adapted to be secured to the piece of furniture and the furniture

door respectively, each plate comprising a projecting pivot pin and each arm having, at the opposite end relative to the braked joint, a through seat that is open and provided with apertures on opposite sides of the arm to receive the projecting pivot pin and enable mounting of either plate indifferently on each arm so that the device is adaptable for being of the "right-hand" or "left-hand" type at choice, snap means being present between the seat and pivot pin for axial locking of the pivot pin into the seat and each pivot pin comprising a rotation bush that is such shaped as to make unidirectional the possibility of full axial introduction of the pivot pin into the seat as far as fitting of the snap means, so that the correct seat aperture for introduction of the pivot pin into the seat itself can be always identified.

[0008] For better explaining the innovative principles of the present invention and the advantages it offers over the known art, possible embodiments applying these principles will be described hereinafter, with the aid of the accompanying drawings. In the drawings:

- Fig. 1 is a diagrammatic elevation side view of a device with braked arms installed in a piece of furniture;
- Fig. 2 is a diagrammatic view partly in section and in a disassembled condition of an articulation region of the device;
- Fig. 3 is a diagrammatic view partly in section of another articulation region in a condition of incorrect partial assembly;
- Fig. 4 is a diagrammatic view partly in section and in a disassembled condition of an alternative embodiment of an articulation region of the device with braked arms;
- Fig. 5 represents a diagrammatic view partly in section of the articulation region in Fig. 4 in a condition of incorrect partial assembly;
- Fig. 6 is an exploded perspective view of the articulation region in Fig. 4.

[0009] With reference to the drawings, shown in Fig. 1 is a device with articulated arms made in accordance with the invention and generally identified with 10.

[0010] Device 10 comprises two arms 11, 12 pivotally mounted on each other through a braked joint 13 and two fastening plates or brackets 14, 15 suitable for fastening (advantageously by screws) to the piece of furniture (at one side 18 of the flank) and the door 19, respectively.

[0011] In Fig. 1 the door is hinged at the upper part thereof at 20 according to a horizontal axis.

[0012] The braked joint is of any known type for the specific application. For instance, it may internally comprise a clutch and a one-way system for clutch release so that in one direction the mutual movement of the two arms is free and in the other is braked. If the device is correctly mounted, movement of the door upwards is in this manner substantially free and the door weight is balanced to keep any reached position steady. Joint sys-

tems with braked movement of the door are well known in the art and therefore will not be herein further shown or described.

[0013] The free ends of arms 11 and 12 are hinged on the plates by a respective pivot pin 16, 17 projecting from the plate surface. Advantageously, to enable fastening of the plates to the door and the furniture flank while maintaining the mutually parallel correct positions of the pivot pins 16, 17 of the two plates, plate 14 has its pivot pin opposite and perpendicular to the surface of the plate designed for fastening to the piece of furniture, while plate 15 has its pivot pin opposite and parallel to the surface of the plate designed for fastening to the door.

[0014] As clearly shown in Figs. 2 and 3, arms 11 and 12 have a seat 21, 22 at their ends for indifferently receiving the pivot pin 16 or 17. Seat 21, 22 is a through seat with apertures on both sides of the arm. It is to be noted that the structure of the pivot pin and seat is identical for both arms and both plates, so as to enable mounting on each arm indifferently of one plate or the other. In this way the device is adaptable for being of the right-hand or left-hand type at choice. For the sake of clarity, shown in Fig. 2 is pivot pin 16 and arm 11 while in Fig. 3 pivot pin 17 and arm 12 are shown. However, it is to be emphasized that they are identical so that mounting can be reversed, and therefore their structure will be hereinafter described in more detail with reference to only one of them.

[0015] Snap means is present between the seat and pivot pin for axially locking the pivot pin into the seat so that mounting of the arm on the selected plate can be obtained by mere axial insertion.

[0016] Each pivot pin comprises a rotation bush 23, 24 that is such shaped as to make unidirectional the possibility of full axial introduction of the pivot pin into the seat as far as fitting of the snap means, thereby enabling the correct seat aperture for introduction of the pivot pin into the seat itself to be always identified. Advantageously, the bush is rotatably fitted on a pivot element 31 that is riveted to the respective plate. The bush can be made of a known antifriction material.

[0017] In the embodiment shown in Figs. 2 and 3, to make unidirectional the possibility of full axial introduction of the pin into the seat, the bushes have a first outer diameter that, in the axial direction towards the free pin end, is followed by a second outer diameter smaller than the first one, so as to be complementary to a reduction in the inner diameter of the seat starting from the aperture (denoted at 25) having the right diameter for introduction of the pin.

[0018] In the figures, the change of diameter of the bush defines a step 26 that is intermediate along the bush extension and mates with a corresponding step 27 intermediate along the seat extension.

[0019] Advantageously, the snap means for axial locking of the pivot pin into the seat comprises resilient wings 28 with teeth 29 radially projecting from the bush end close to the free end of the pin, for snap fitting into a

corresponding step 30 present in the seat (facing the aperture of the seat that is opposite to that of correct introduction of the pin).

[0020] Shown in chain line in Fig. 2 is the correct fitting position of the pivot pin into the seat (valid for both pins and both arms). Instead, shown in Fig. 3 is the position that the pin can reach in case of wrong introduction (also valid for both pins and both arms). As can be viewed, the position of wrong introduction is well apparent during mounting of the device to the piece of furniture.

[0021] A view similar to that in Fig. 2 is shown in Fig. 4, but it shows a different embodiment of the means for preventing wrong mounting. For description convenience, elements similar to those of the preceding embodiment are allocated the same reference numerals increased by 100. Thus, the arms of the device (which device for the rest is similar to that shown in Fig. 1) comprise a seat 121 for receiving a pivot pin 116 including a bush 123, advantageously fitted on the respective plate by a pivot element 131. Still advantageously, the snap means for axial locking of the pin in the seat comprises resilient wings 128 with teeth 129 radially projecting from the bush end that is close to the free end of the pin, for snap fitting in a corresponding step 130 present in the seat (facing the seat aperture that is opposite to that 125 of correct introduction of the pin).

[0022] In this second embodiment, to make unidirectional the possibility of full axial introduction of the pin into the seat, bush 123 is provided with projections 150 disposed close to its base and designed to interfere with parts of the arm around the seat aperture that is opposite to that 125 of correct introduction of the pin. This is well apparent in Fig. 5 where it is shown the position of partial introduction into the seat that can be reached by the pivot pin in case of a wrong-mounting attempt (i.e. with the pin entering the seat from the wrong aperture).

[0023] In particular, the arm has a recess 151 surrounding the aperture 125 of correct introduction of the pin into the seat and designed to receive the projections 150. This recess is not present in the opposite aperture of the seat where on the contrary there is an interference surface 152. In this way, when the arm is correctly inserted on the pin (as shown in chain line in Fig. 4), the projections 150 enter the circumferential recess 151 and the snap-fitting means reaches their correct fitting position. On the contrary, when the arm is inserted in an overturned position on the pin (Fig. 5) projections 150 bear on the interference surface 152 and the arm keeps raised and visibly not coupled.

[0024] Advantageously, projections 150 are disposed to a radial distance from the side wall of the bush so as to define a channel 153 between each projection and the bush side wall. This channel is used for passage of a collar 154 that surrounds the seat aperture 125 on the arm. In this way, there is a good covering of the pivot pin by the arm and the overhanging portion of the articulation is reduced.

[0025] Projections 150 can be circumferentially ex-

tended to form an endless ring around said side wall of the bush or (as shown in Fig. 6) only extended over an angular length of the bush. In particular, only two projections 150 can be provided which are disposed at diametrically opposite positions on the bush base.

[0026] At this point it is apparent that the intended purposes of the invention have been reached by providing a device that, as a person skilled in the art can now easily understand, can be readily mounted both on the right and left side of a furniture door (for instance as in Fig. 1 or as a mirror image of Fig. 1) by merely overturning plates 14 and 15 and fitting the arms thereon (in an exchanged way) in such a manner that the device is oriented so as to provide a braking effect continuously counteracting falling of the door.

[0027] Due to the above described innovative structure, if the device is fully fitted on the pivot pins so as to be coupled in the right place, its assembly orientation is the correct one.

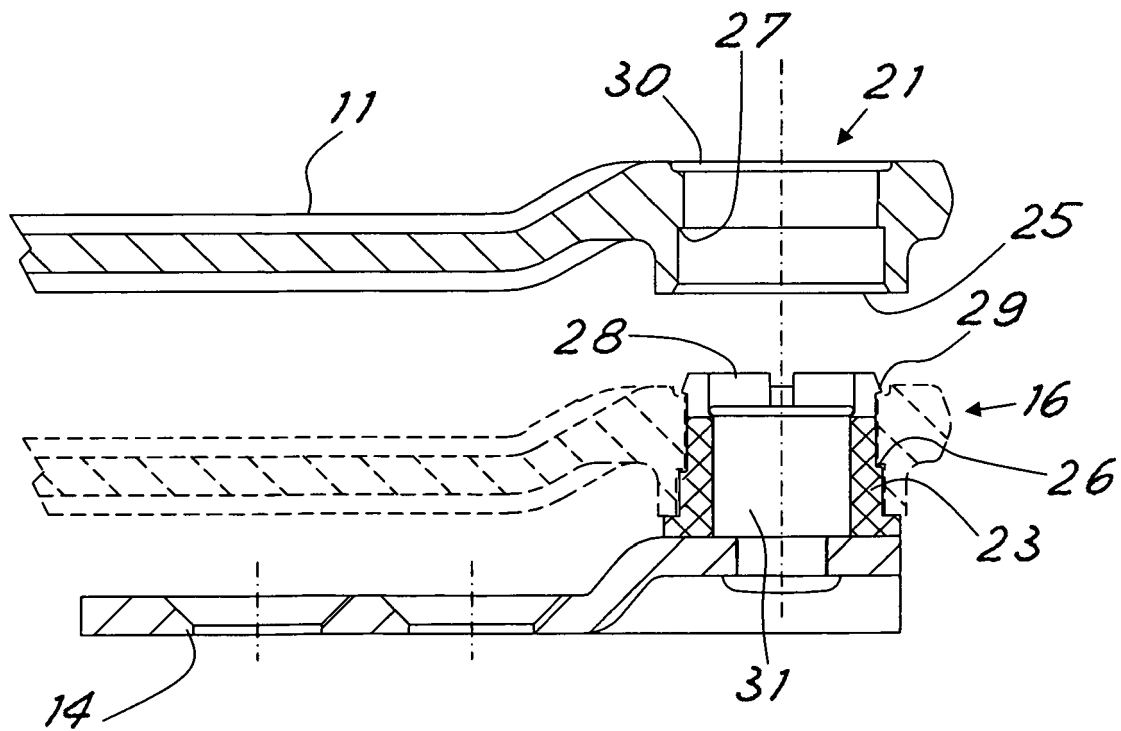
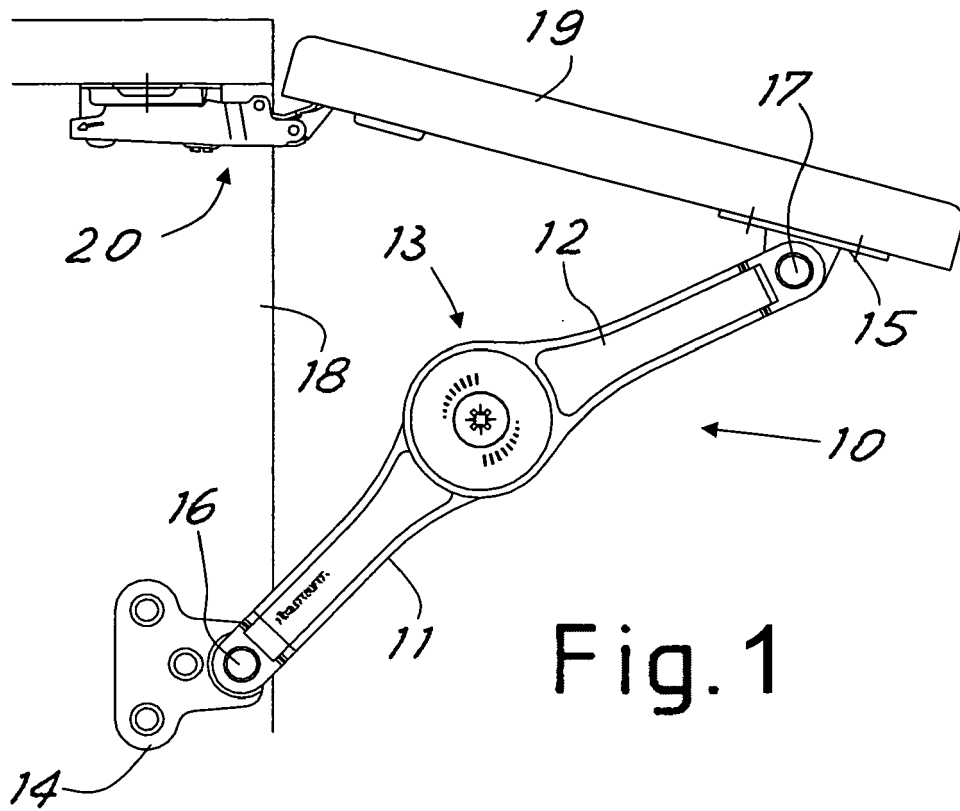
[0028] Obviously, the above description of an embodiment applying the innovative principles of the present invention is given by way of example only and therefore must not be considered as a limitation of the scope of the patent rights herein claimed.

Claims

1. A device with articulated arms for the braked movement of a furniture door comprising two arms pivotally mounted on each other through a braked joint and two fastening plates adapted to be secured to the piece of furniture and the furniture door respectively, each plate comprising a projecting pivot pin and each arm having, at the opposite end relative to the braked joint, a through seat that is open and provided with apertures on opposite sides of the arm to receive the projecting pivot pin and enable mounting of either plate indifferently on each arm so that the device is adaptable for being of the "right-hand" or "left-hand" type at choice, snap means being present between the seat and pivot pin for axial locking of the pivot pin into the seat and each pivot pin comprising a rotation bush that is such shaped as to make unidirectional the possibility of full axial introduction of the pivot pin into the seat as far as fitting of the snap means, so that the correct seat aperture for introduction of the pivot pin into the seat itself can be always identified.
2. A device as claimed in claim 1, **characterized in that**, in order to make unidirectional the possibility of full axial introduction of the pivot pin into the seat, the bush has a first outer diameter that, in the axial direction towards the free pin end, is followed by a second outer diameter smaller than the first one, to be complementary to a reduction in the inner diameter of the seat starting from the seat aperture suit-

able for correct introduction of the pin.

3. A device as claimed in claim 1, **characterized in that**, in order to make unidirectional the possibility of full axial introduction of the pivot pin into the seat, the bush has projections disposed close to its base that are designed to interfere with parts of the arm around the seat aperture that is opposite to that for correct introduction of the pin.
4. A device as claimed in claim 3, **characterized in that** the arm has a recess designed to receive the projections, which recess is disposed around the aperture for correct introduction of the pin into the seat.
5. A device as claimed in claim 3, **characterized in that** the projections are disposed to a radial distance from the side wall of the bush so as to define a channel between each projection and the bush side wall for passage of a collar present on the arm and surrounding the seat aperture that is suitable for correct introduction of the pin into the seat.
6. A device as claimed in claim 3, **characterized in that** the projections are circumferentially extended so as to form an endless ring around said bush side wall.
7. A device as claimed in claim 3, **characterized in that** the projections are two in number, and are disposed diametrically opposite on the bush.
8. A device as claimed in claim 1, **characterized in that** the snap means for axial locking of the pin into the seat comprises resilient wings with teeth radially projecting from the bush end close to the free end of the pin, for snap fitting into a corresponding step present in the seat.
9. A device as claimed in claim 1, **characterized in that** the bush is rotatably fitted on a pivot element riveted to the respective plate.
10. A device as claimed in claim 1, **characterized in that** one plate has the pin that is opposite and perpendicular to a surface of the plate designed for fastening to the piece of furniture, while the other plate has the pin that is opposite and parallel to a surface of the plate designed for fastening to the furniture door.



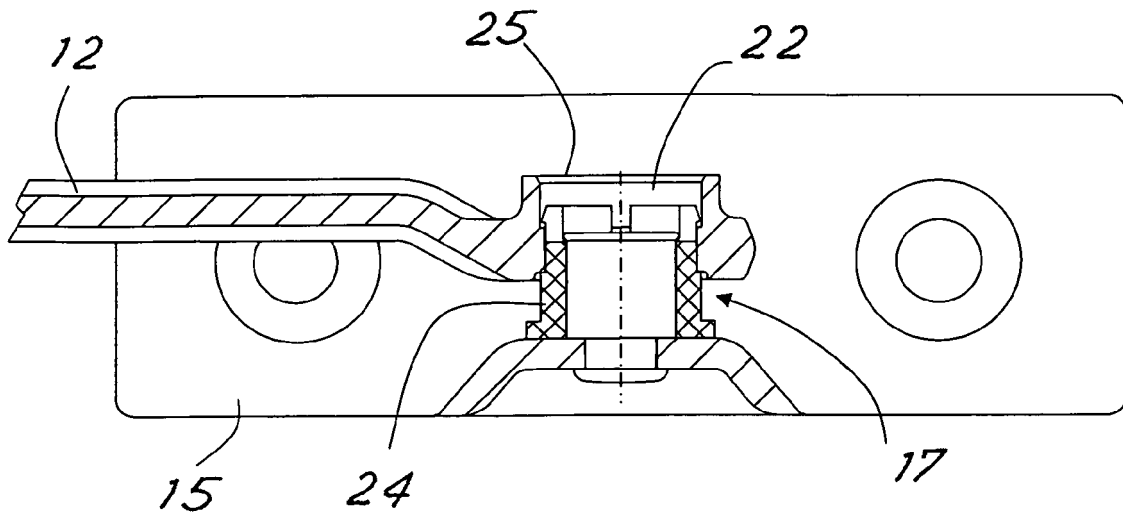


Fig.3

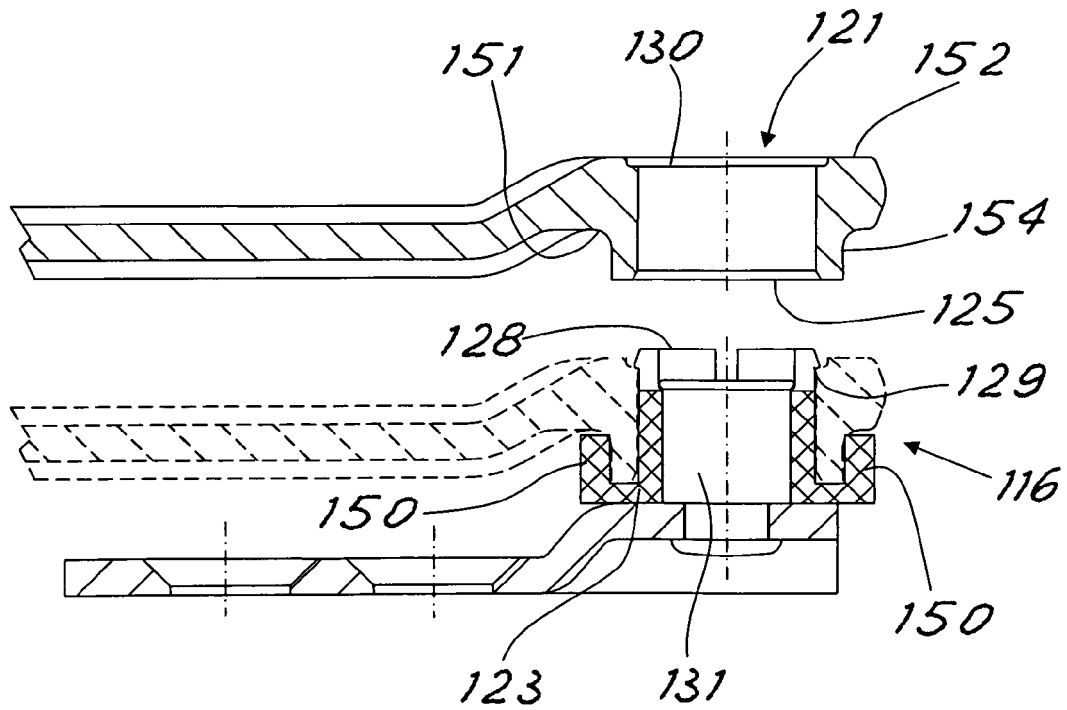


Fig.4

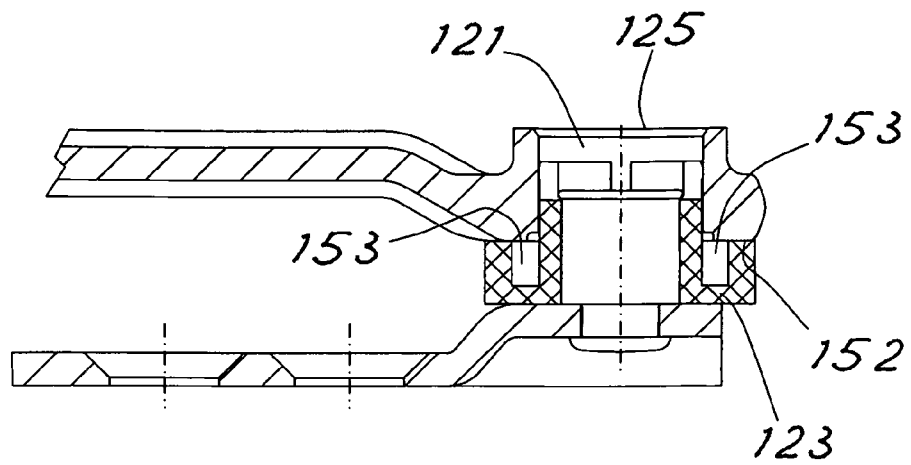


Fig.5

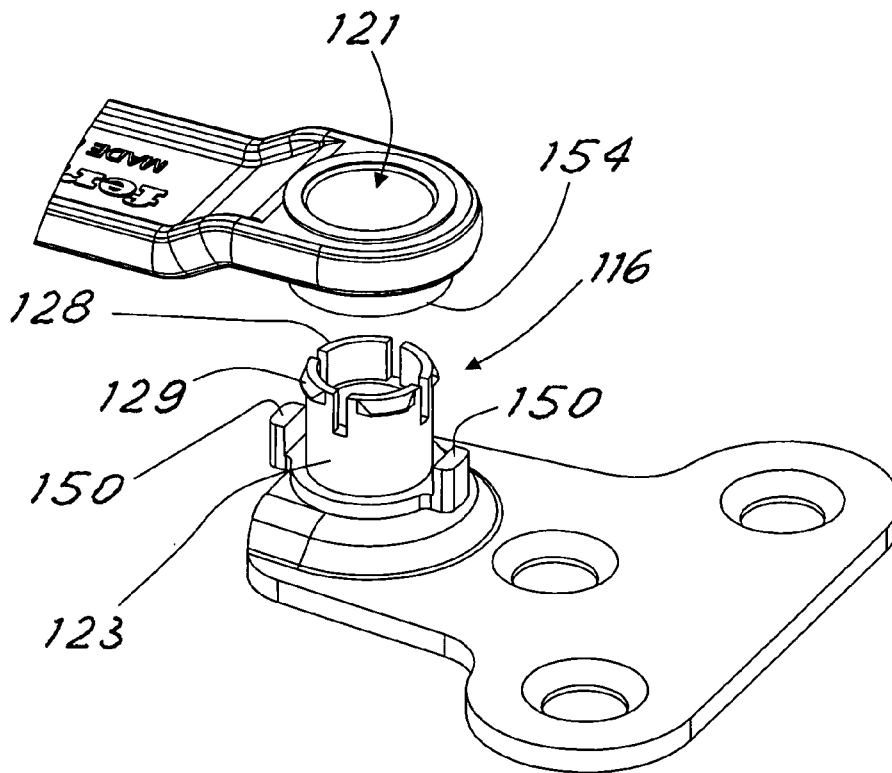


Fig.6