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## (54) Buffering hinge for a furniture door

(57) The present invention relates to a buffering hinge for a furniture door comprising a fixing member, a grooved cup-shaped support (1), an outer rocker arm (7), an inner rocker arm (5), a connecting rod structure (10), a return spring (8) and a hydraulic cushioning cylinder (13), wherein a shaft (11) is fixed to the casing (18), and the connecting rod structure(10) is provided with elongated holes (102) which extends at an angle to the horizontal direction and through which the shaft (11) extends slidably; a first boss (101) and a second boss (103) are arranged on each of the two side walls of the connecting rod structure (10); the outer rocker arm (7) is rotatably connected with the casing (18) at one end and rotatably connected with the cup-shaped support (1) at the other end via one leg of an U-shaped pin (2); two connecting walls extending outward are arranged on one end of the inner rocker arm (5) and rotatably connected with one end of the casing (18) and rotatably connected with one end of the connecting rod structure (10); each of the two connecting walls is provided with a recess into which a corresponding first boss (101) may be moved, and the other end of the inner rocker arm (5) is rotatably connected with the cup-shaped support (1) via the other leg of the U-shaped pin (2); one end of the piston rod of the hydraulic cushioning cylinder (13) is rotatably connected with the other end of the connecting rod structure (10). The present invention has advantages over the prior art, including lower resistance in operation, simpler structure, easiness of manufacture and installation, lower manufacturing costs etc.

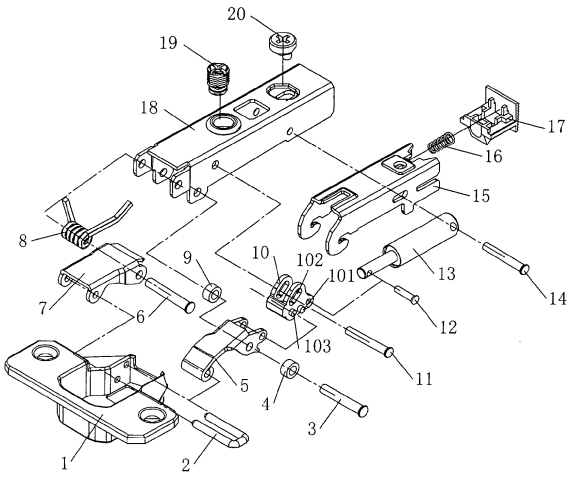


FIG. 1

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## Description

### Technical Field

**[0001]** The present invention relates to a buffering hinge for a furniture door.

### Background

**[0002]** Currently, a double-connecting-rod buffering hinge for a furniture door comprises a fixing member fixed on a frame, a grooved cup-shaped support fixed on the door, a first and a second rotary shafts, a U-shaped pin, an outer rocker arm, an inner rocker arm, a transition connecting rod, an active connecting rod and a return spring. The fixing member comprises a casing, an adjustment member for installation arranged in the casing, a base cooperating with the adjustment member and a movable plate cooperating with the base. The base may be moved relative to the movable plate which is fixed onto the frame, and an adjusting screw is arranged between the casing and the adjustment member for connecting the casing and the adjustment member. The outer rocker arm is rotatably connected with the casing at one end via the first rotary shaft and rotatably connected with the cup-shaped support at the other end via one leg of the U-shaped pin. The inner rocker arm is rotatably connected with one end of the transition connecting rod at one end via the second rotary shaft and rotatably connected with the cup-shaped support at the other end via the other leg of the U-shaped pin. The return spring is arranged on the first rotary shaft. Additionally, the current buffering hinge further comprises a hydraulic cushioning cylinder, wherein the piston of the hydraulic cushioning cylinder is rotatably connected with one end of the active connecting rod and the other end of the active connecting rod is rotatably connected with one end of the transition connecting rod via a third rotary shaft so that the active connecting rod can be rotated relative to the casing and the inner rocker arm, and the hydraulic cushioning cylinder is rotatably connected with the casing. Although the current buffering hinge shows buffering effect, its installation is inconvenient due to its complex structure, many connecting links and unordered arrangement of parts.

### SUMMARY OF THE INVENTION

**[0003]** The purpose of the present invention is to overcome the shortcomings of the prior art by providing a buffering hinge for a furniture door, which renders easy installation, simple and more reasonable structure as well as long service life, and in which a single connecting rod with kidney-shaped sliding holes is employed in replace of the existing popular double-connecting rod structure.

**[0004]** To achieve the purposes above, the buffering hinge for furniture door according to the present invention is characterized in

comprising a fixing member which may be fixed on a frame and a grooved cup-shaped support which may be fixed on a door, wherein the fixing member comprises a casing, an adjustment member for installation arranged in the casing, a button arranged on the ends of both the casing and the adjustment member , an adjusting screw and an eccentric wheel both of which are arranged between the casing and the adjustment member for connection of the casing with the adjustment member, and a shaft fixed to the casing;

further comprising an outer rocker arm, an inner rocker arm, a connecting rod structure and a return spring, wherein the connecting rod structure is provided with elongated holes which extend at an angle to the horizontal direction and through which the shaft extends slidably so that the inner rocker arm may rotate relative to both the casing and the cup-shaped support, and a first boss and a second boss are arranged on each of the two side walls of the connecting rod structure, and the outer rocker arm is rotatably connected with one end of the casing at one end via a first pin and rotatably connected with the cup-shaped support at the other end via one leg of an U-shaped pin, and two connecting walls extending outward are arranged on one end of the inner rocker arm and rotatably connected with one end of the casing via a second pin and rotatably connected with one end of the connecting rod structure via the second bosses, and each of the two connecting walls is provided with a recess into which the first bosses may be moved, and the other end of the inner rocker arm is rotatably connected with the cup-shaped support via the other leg of the U-shaped pin, and the return spring is arranged around the first pin;

still comprising a hydraulic cushioning cylinder, wherein the hydraulic cushioning cylinder is installed in the adjustment member and rotatably connected with both the casing and the adjustment member via a fourth pin, and one end of the piston rod of the hydraulic cushioning cylinder is rotatably connected with the other end of the connecting rod structure via a third pin.

**[0005]** Preferably, the connecting rod structure takes the form of a frame which can be one-piece or formed with two or more superimposed and fixed pieces.

**[0006]** Preferably, both walls of the connecting rod structure are triangular, and one kidney-shaped elongated hole is arranged at an angle to the horizontal direction and in opposition to the line from the second boss to the third pin in each of the walls of the connecting rod structure, and the first boss is arranged on each of the walls of the connecting rod structure between the second boss and the third pin.

**[0007]** Preferably, the inner rocker arm may be one-piece or formed with two or more superimposed pieces fixed together.

**[0008]** The present invention has advantages over the prior art, including lower resistance in operation, simpler structure, easiness of manufacture and installation, lower production costs as well as better buffering effect when closing the door due to the arrangement of the single connecting rod structure. Additionally, the first boss may

undertake the forces from the second bosses and the third pin and thus increases the service life of the product with a more reasonable structure.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0009]**

FIG. 1 is an exploded view of an embodiment according to the present invention;
FIG. 2 is a perspective view of the embodiment of FIG. 1 in the contracted position after assembled;
FIG. 3 is a perspective view of the embodiment of FIG. 1 in the stretched state after assembled;
FIG. 4 is a perspective view of the embodiment of FIG. 2 with the cup-shaped support removed;
FIG. 5 is an exploded view of the hydraulic cushioning cylinder, the connecting rod structure and the inner rocker arm according to the present invention;
FIG. 6 is a front view of the hydraulic cushioning cylinder, the connecting rod structure and the inner rocker arm which are assembled and in the contracted state;
FIG. 7 is a front view of the hydraulic cushioning cylinder, the connecting rod structure and the inner rocker arm which are assembled and in extended state.

## DETAILED DESCRIPTION OF EMBODIMENTS

**[0010]** An embodiment according to the present invention is described below in detail. The embodiment is illustrated in the drawings through which like reference numbers refer to like elements. The embodiment described below with reference to the drawings is intended to be exemplary and used only for explaining the present invention and not for constituting any restriction to the present invention.

**[0011]** In the description of the present invention, terms "first", "second", "third" and "fourth" are only used for descriptive purposes without the intention to indicate or imply the level of importance.

**[0012]** As shown in FIG 1-7, a buffering hinge for a furniture door comprises a fixing member fixed on a frame and a grooved cup-shaped support 1 which may be secured to a door. The fixing member comprises: a casing 18; an adjustment member 15 for installation arranged in the casing; a button 17 arranged on a same side of the casing 18 and the adjustment member 15; a spring 16 arranged in the button 17; an adjusting screw 19 and an eccentric wheel 20 both of which are arranged between the casing 18 and the adjustment member 15 for connecting the casing 18 with the adjustment member 15; and a shaft 11 fixed to the casing 18.

**[0013]** The buffering hinge also comprises an outer rocker arm 7, an inner rocker arm 5, a connecting rod structure 10 and a return spring 8. The connecting rod structure 10 is provided with elongated holes 102 which extend at an angle to the horizontal direction and through which the shaft 11 extends slidably so that the inner rocker arm 5 may rotate relative to both the casing 18 and the cup-shaped support 1. A first boss101 and a second boss 103 are provided on each of the side walls of the connecting rod structure 10. The outer rocker arm 7 is rotatably connected with one end of the casing 18 at one end via a first pin 6 and is rotatably connected with the cup-shaped support 1 at the other end via one leg of a U-shaped pin 2. On one end of the inner rocker arm 5 are arranged two connecting walls, which extend outwardly and are rotatably connected with one end of the casing 18 via a second pin 3 and rotatably connected with one end of the connecting rod structure 10 via the second bosses 103. On each of the two connecting walls a recess 51 is arranged, a first boss 101 may be moved into the corresponding recess 51. The other end of the inner rocker arm 5 is rotatably connected with the cup-shaped support 1 via the other leg of the U-shaped pin 2. The return spring 8 is arranged around the first pin 6.

**[0014]** The buffering hinge further comprises a hydraulic cushioning cylinder 13, wherein the hydraulic cushioning cylinder 13 is installed in the adjustment member 15 and rotatably connected with both the casing 18 and the adjustment member 15 via the fourth pin 14, one end of the piston rod of the hydraulic cushioning cylinder 13 is rotatably connected with the other end of the connecting rod structure 10 via a third pin 12.

**[0015]** When opening the door, the outer rocker arm 7 and the inner rocker arm 5 are rotated, and thereby the connecting rod structure 10 will move relatively to the shaft 11 as the shaft 11 slides along the elongated holes 102 and push back the piston rod of the hydraulic cushioning cylinder 13 so as to open the door.

**[0016]** When closing the door, the outer rocker arm 7 and the inner rocker arm 5 are rotated, and thereby the connecting rod structure 10 move relatively to the shaft 11 as the shaft 11 slides along the elongated holes 102 in the opposite direction and extend the piston rod of the hydraulic cushioning cylinder 13 so as to close the door. When the door is closed, each of the first bosses 101 may be move into a corresponding recess 51 to undertake the forces from the second bosses 103 and the third pin 12, thus increasing the service life of the product with improved structure.

**[0017]** In the embodiment, the connecting rod structure 10 takes the form of a frame which can be unitary or formed with two or more superimposed pieces fixed together.

**[0018]** In this embodiment, both walls of the connecting rod structure 10 are triangular, and a kidney-shaped elongated hole 102 is arranged in each of the walls of the connecting rod structure 10 in opposition to the line from the second boss 103 to the third pin 12 and at an angle to the horizontal direction. Furthermore, on each of the walls of the connecting rod structure 10, a corresponding first boss 101 is arranged between the pin 21 and the third pin 12.

**[0019]** In this embodiment, the inner rocker arm 5 can be integral or formed with two or more superimposed pieces fixed together.

**[0020]** Although there is an embodiment of the present invention shown and described herein, it is understood that the embodiment disclosed herein may be changed, modified, substituted or varied in many ways without departing from the principles and purposes of the present invention and the scope of the present invention shall be defined by the Claims and its equivalents.

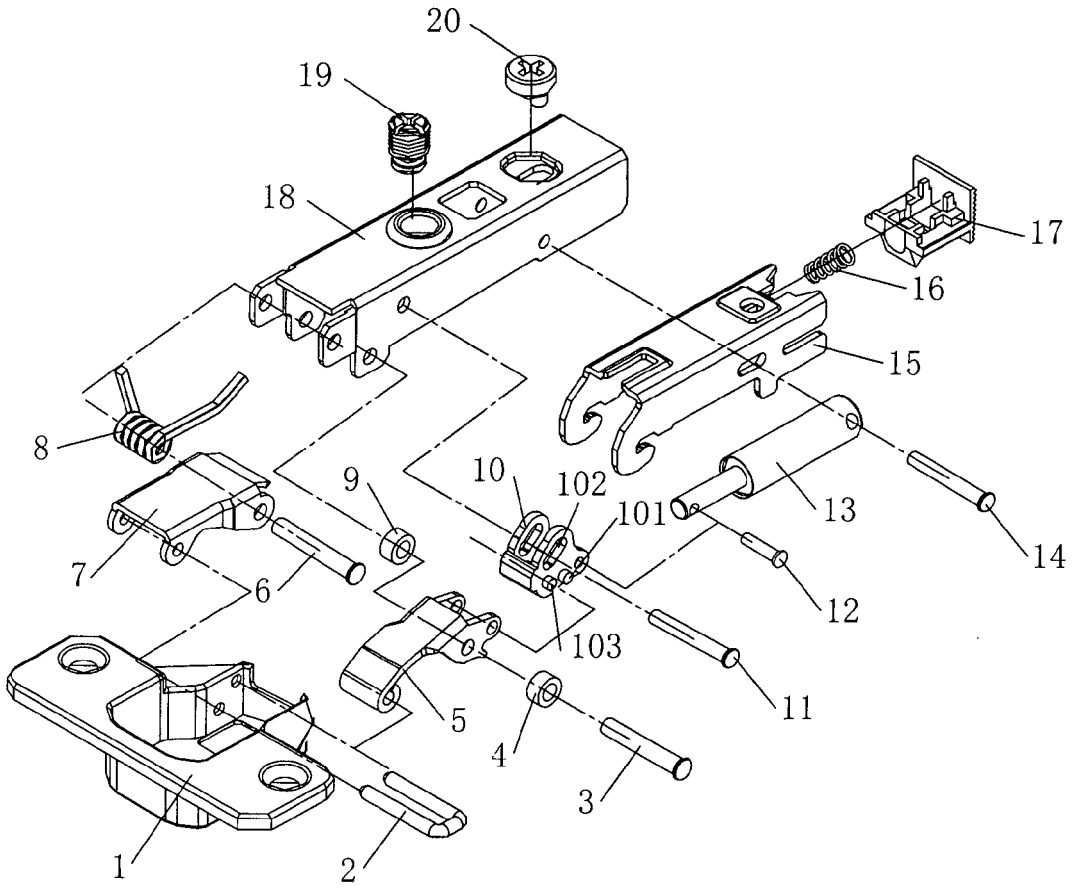
## Claims

1. A buffering hinge for a furniture door, **characterized in**
comprising a fixing member fixed on a frame and a grooved cup-shaped support (1) fixed on a door; wherein the fixing member comprises a casing (18), an adjustment member (15) for installation arranged in the casing, a button (17) arranged on the a same side of the casing (18) and the adjustment member (15); an adjusting screw (19) and an eccentric wheel (20) both of which are arranged between the casing (18) and the adjustment member (15) for connection of the casing (1) with the adjustment member (15), and a shaft (11) fixed to the casing (18);
also comprising an outer rocker arm (7), an inner rocker arm (5), a connecting rod structure (10) and a return spring (8), wherein the connecting rod structure (10) is provided with elongated holes (102) which extend at an angle to the horizontal direction and through which the shaft (11) extends slidably so that the inner rocker arm (5) may rotate relative to both the casing (18) and the cup-shaped support (1), and a first boss (101) and a second boss (103) are arranged on each of the two side walls of the connecting rod structure (10), and the outer rocker arm (7) is rotatably connected with one end of the casing (18) at one end via a first pin (6) and rotatably connected with the cup-shaped support (1) at the other end via one leg of an U-shaped pin (2), and two connecting walls extending outward are arranged on one end of the inner rocker arm (5)and rotatably connected with one end of the casing (18) via a second pin (3) and rotatably connected with one end of the connecting rod structure (10) via the second boss (103), and each of the two connecting walls is provided with a recess (51) into which the first boss (101) may be moved, and the other end of the inner rocker arm (5) is rotatably connected with the cup-shaped support (1) via the other leg of the U-shaped pin (2), and the return spring (8) is arranged around the first pin (6);
further comprising a hydraulic cushioning cylinder (13), wherein the hydraulic cushioning cylinder (13) is installed in the adjustment member (15) and rotatably connected with both the casing (18) and the adjustment member (15) via a fourth pin (14), and one end of the piston rod of the hydraulic cushioning cylinder (13) is rotatably connected with the other end of the connecting rod structure (10) via a third pin (12).

2. The buffering hinge for a furniture door according to Claim 1, **characterized in that** the connecting rod structure (10) takes the form of a frame which can be one-piece or formed with two or more superimposed pieces fixed together.

3. The buffering hinge for a furniture door according to Claim 1 or 2, **characterized in that** both walls of the connecting rod structure (10) are triangular, and one kidney-shaped elongated hole (102) extends at an angle to the horizontal direction and in opposition to the line from the second boss (103) to the third pin (12) in each of the walls of the connecting rod structure (10), and the first boss (101) on each of the walls of the connecting rod structure (10) is arranged between the second boss (103) and the third pin (12).

4. The buffering hinge for a furniture door according to Claim 1, **characterized in that** the inner rocker arm (5) may be one-piece or formed with two or more superimposed pieces fixed together.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102
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103
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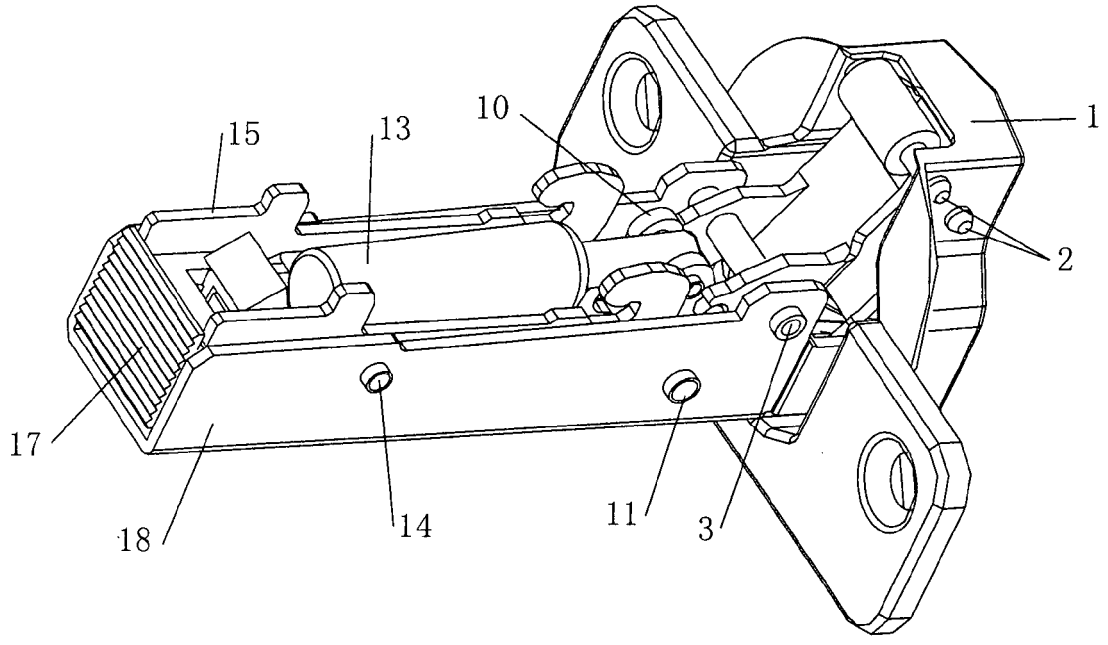
2

FIG. 1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14
11
3

FIG. 2

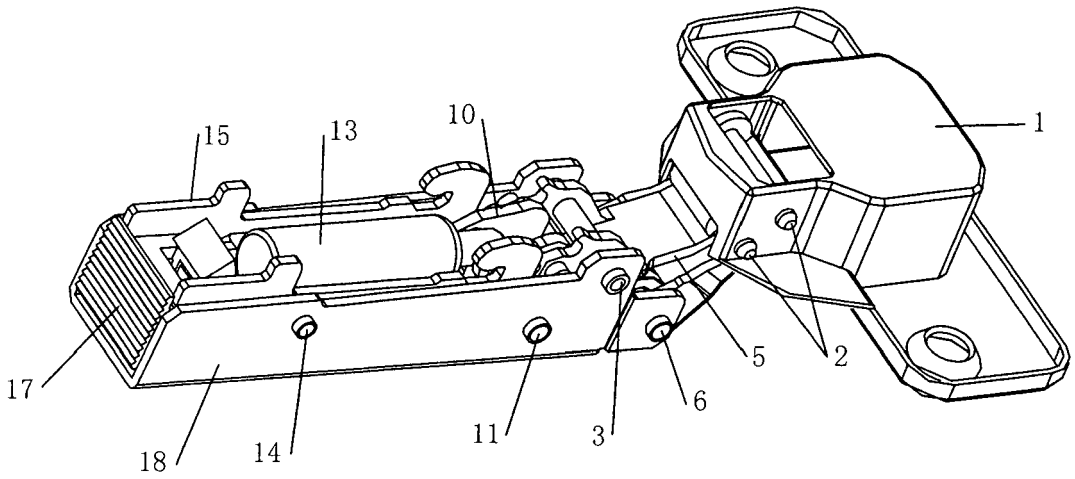


FIG. 3

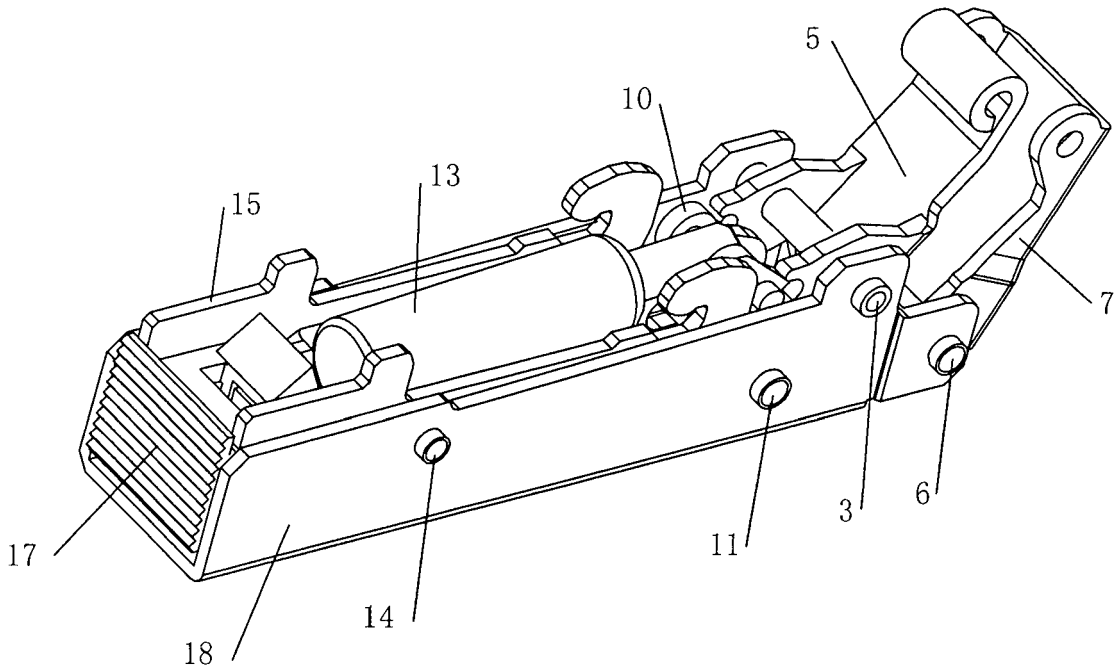


FIG. 4

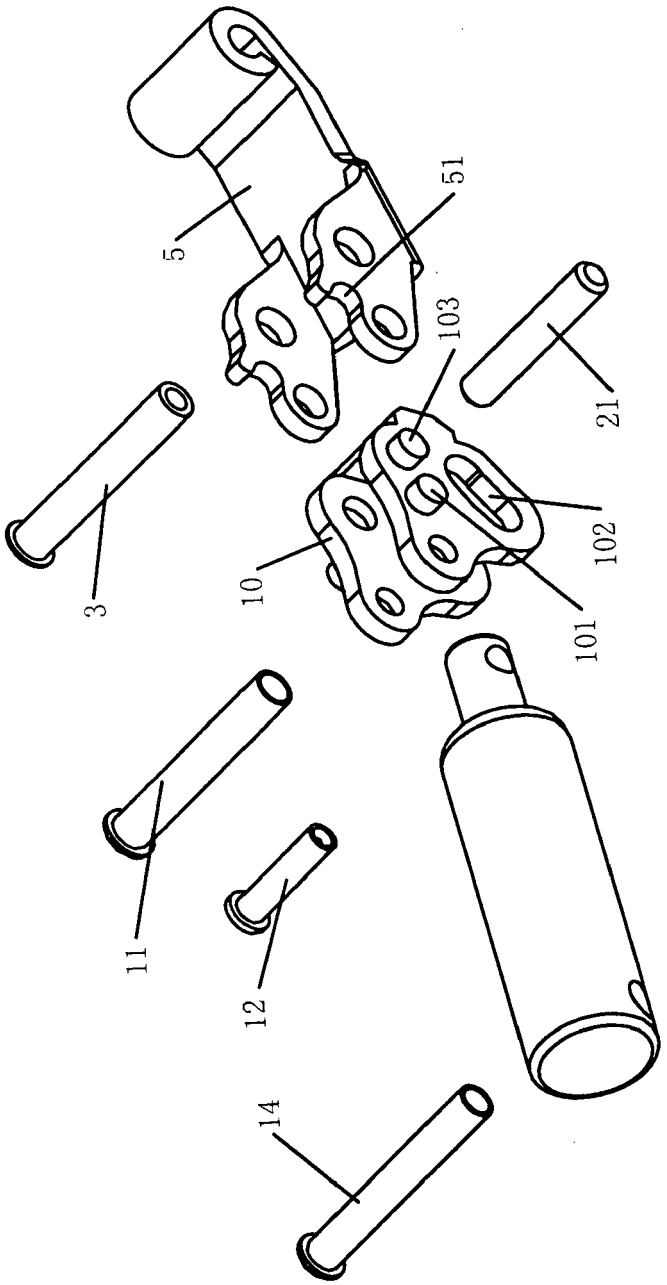


FIG. 5

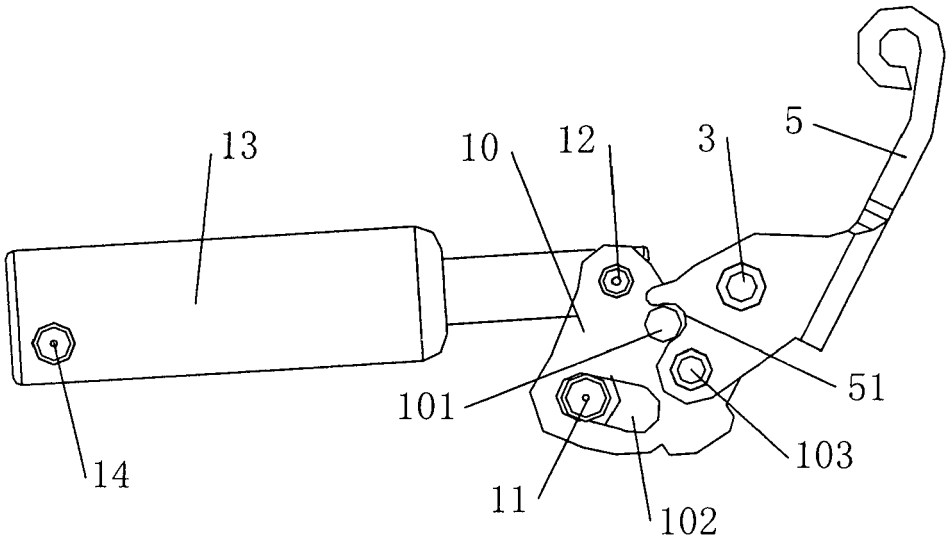


FIG. 6

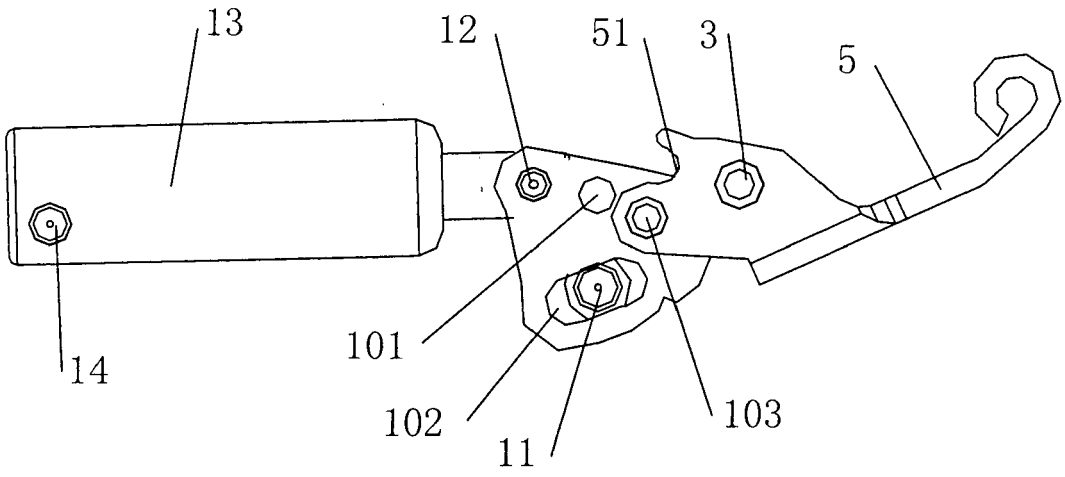


FIG. 7