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(54) **HINGE PROVIDING CUSHIONING EFFECT AND APPARATUS PROVIDED WITH THE HINGE**
SCHARNIER MIT DÄMPFUNGSWIRKUNG UND VORRICHTUNG MIT DEM SCHARNIER
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Description

FIELD

[0001] The present disclosure relates to a hinge, and particularly to a hinge having a buffering effect and a device having the hinge.

BACKGROUND

[0002] A hinge applied to a drop-down door of an oven at present does not have an effect of a door self-closing. That is, a manipulator is required to push or pull the door hard in whole processes of opening and closing the door, thus resulting in a poor door-closing experience.

[0003] In EP 2 664 730 782 A2 door hinge is described, which comprises members to protect the first damper and the second damper from damage caused by overloads that might arise when a household appliance door is closed fast. The hinge also prevents the door from making noise and being open and closed and slows down the fast movement during closing.

[0004] In CN 204 126 434 U an oven dampening hinge is described that comprises a body and a hinge arm, which is movably hinged to the front end of the body. A pull arm, which can slide forward and backwards is movably hinged to the hinge arm and is connected to the pull body at its rear end through an attention spring. A dampening cylinder is arranged in a pull arm and the piston rod of the dampening cylinder is fixed to the pull arm so that when closing the door of the oven the reset of the pull arm is buffered through the dampening cylinder. Thus the reset movement speed is decreased and a buffering effect is achieved when closing the door, which also avoids noise.

SUMMARY

[0005] The present disclosure aims to implement a solution of a hinge of an oven having a good performance, so as to improve at least one of using effects of the hinge in the related art. Thus, the present disclosure intends to provide the hinge, which may close a door body relying on an elastic force of the hinge when the door body is closed to a certain degree, and may also achieve an automatic closing process in a gentle and noise-free manner through a damper.

[0006] The present disclosure is to propose a device having the hinge further.

[0007] The hinge having a buffering effect according to claim 1 includes a first assembly, a second assembly, a main spring, a connecting piece, a damper assembly, a connecting assembly and a locking spring. The first assembly and the second assembly are configured to be fixed to a device body and a drop-down door respectively and rotatably connected by means of a first rotary shaft, so that the drop-down door is configured to be rotatably pulled downwards with respect to the device body. The

first assembly is configured to be a rectangular casing and includes a first end rotatably connected with the second assembly and a second end opposite to the first end. The first assembly has a first guiding groove adjacent to the first end, and the second assembly is provided with a cam portion. The main spring is disposed in the first assembly and a first end of the main spring is fixedly connected with the second end of the first assembly. The connecting piece is disposed in the first assembly, and the connecting piece is connected with a second end of the main spring and rotatably connected with the second assembly by means of a second rotary shaft. The connecting piece is provided with an upper cover so as to be fitted with the first assembly to form a cavity, and the connecting piece has a second guiding groove. The damper assembly includes a damper body, an extending and retracting rod, a return spring, a position limiting piece and a third rotary shaft. The damper body is located in the cavity and has a third guiding groove. The extending and retracting rod extends from the damper body towards the second assembly. The return spring is fitted over the extending and retracting rod and disposed in the damper body. The position limiting piece is fixed in the first assembly, and the position limiting piece is penetrated by the extending and retracting rod. The third rotary shaft connects the damper body with the connecting piece. The third rotary shaft is rotatably and slidably disposed in the second guiding groove and the third guiding groove. The connecting assembly is disposed between the second assembly and the extending and retracting rod. The connecting assembly is fixedly connected with the extending and retracting rod. The connecting assembly is connected with the connecting piece by means of a fourth rotary shaft. The fourth rotary shaft is rotatably and slidably disposed in the first guiding groove. The connecting assembly includes a driven pulley. The locking spring is fitted over the extending and retracting rod and disposed between the position limiting piece and the connecting assembly so as to allow the driven pulley to keep rotatable contact with the cam portion. The cam portion has a balanced stage, a critical stage and a buffered-closing stage in a rotation process of the second assembly from a position where a largest opening angle is formed between the first assembly and the second assembly to the first assembly, in which the cam portion is successively fitted with the driven pulley in these stages. In the balanced stage, the locking spring is in a compressed state and changes to a reset state, the return spring is in a natural state, the damper body is motionless in the cavity, the main spring is in a stretched state and changes to a reset state, and a tensioning force produced by the main spring is balanced with a load weight of the hinge. In the critical stage, the locking spring is in the compressed state and changes to the reset state, the return spring is in the natural state, the damper body slides in the cavity in a direction towards the second end, the main spring is in the stretched state, and the tensioning force produced by the main spring is larger than the

load weight of the hinge. In the buffered-closing stage, the locking spring is in the compressed state and changes to the reset state, the return spring is in the natural state, the extending and retracting rod is retracted into the damper body, the main spring is in the stretched state and changes to the reset state, the tensioning force produced by the main spring is larger than the load weight of the hinge and the damper body has a reverse buffering effect.

[0008] In the hinge according to embodiments of the present disclosure, as the main spring is adopted, a weight of the drop-down door may be balanced when the drop-down door is pulled downwards, thus realizing effects of stable opening and stable closing. In addition, as the locking spring and the damper assembly are adopted, the drop-down door may be closed automatically and slowly, thus improving a using experience of a user.

[0009] In some embodiments, the first assembly includes a bottom plate and side walls extending upwards from two sides of the bottom plate. The first guiding groove is formed in each of the two side walls and has an arc shape.

[0010] In some embodiments, the connecting piece includes two side sheets tightly attached to the side walls respectively and the upper cover joint to the two side sheets.

[0011] In some embodiments, the cavity has a rectangular shape, the damper body has a cylindrical shape, and shapes of the damper body and the cavity are matched with each other so as to allow the damper body to slide in the cavity.

[0012] In some embodiments, the position limiting piece has an L shape and includes a bottom sheet fixedly connected with the bottom plate and a blocking sheet extending upwards from the bottom sheet, and the blocking sheet is penetrated by the extending and retracting rod.

[0013] In some embodiments, the connecting assembly includes a connecting body fixedly connected with the extending and retracting rod and the driven pulley disposed to the connecting body. The connecting body and the connecting piece are connected by means of the fourth rotary shaft slidably disposed in the first guiding groove. The connecting body is provided with a fixed shaft, the driven pulley has an annular shape and is fitted over the fixed shaft, and the driven pulley keeps being rotatably connected with the cam portion.

[0014] In some embodiments, corresponding to the balanced stage, the drop-down door is configured to rotate by an angle of 50°-70°.

[0015] In some embodiments, corresponding to the critical stage, the drop-down door is configured to rotate by an angle of 10°-15°.

[0016] In some embodiments, corresponding to the buffered-closing stage, the drop-down door is configured to rotate by an angle of 10°-25°.

[0017] A device according to claim 11 includes a device body, a drop-down door and a hinge configured for the

device according to the above embodiments.

[0018] In the device according to embodiments of the present disclosure, as the main spring is adopted, a weight of the drop-down door may be balanced when the drop-down door is pulled downwards, thus realizing effects of stable opening and stable closing. In addition, as the locking spring and the damper assembly are adopted, the drop-down door may be closed automatically and slowly, thus improving a using experience of a user.

[0019] Additional aspects and advantages of embodiments of present disclosure will be given in part in the following descriptions, become apparent in part from the following descriptions, or be learned from the practice of the embodiments of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] These and other aspects and advantages of embodiments of the present disclosure will become apparent and readily appreciated from descriptions made with reference to the following drawings.

Fig. 1 is a perspective view of a hinge having a buffering effect according to an embodiment of the present disclosure.

Fig. 2 is an exploded view of a hinge having a buffering effect according to an embodiment of the present disclosure.

Fig. 3 is a sectional view of the hinge having the buffering effect in Fig. 1 along line III-III.

Fig. 4 is a perspective view of a first assembly of a hinge having a buffering effect according to an embodiment of the present disclosure.

Fig. 5 is a perspective view of a stepped piece of a hinge having a buffering effect according to an embodiment of the present disclosure.

Fig. 6 is a perspective view of a connecting piece of a hinge having a buffering effect according to an embodiment of the present disclosure.

Fig. 7 is a perspective view of a connecting body of a hinge having a buffering effect according to an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0021] Embodiments of the present disclosure will be described in detail and examples of the embodiments will be illustrated in the drawings, where same or similar reference numerals are used to indicate same or similar members or members with same or similar functions. The embodiments described herein with reference to drawings are explanatory, illustrative, and used to generally understand the present disclosure. The embodiments shall not be construed to limit the present disclosure.

[0022] In the specification, it is to be understood that terms such as "central," "longitudinal," "lateral," "length," "width," "thickness," "upper," "lower," "front," "rear," "left," "right," "vertical," "horizontal," "top," "bottom," "inner,"

"outer," "clockwise," and "counterclockwise" should be construed to refer to the orientation as then described or as shown in the drawings under discussion. These relative terms are for convenience of description and do not require that the present disclosure be constructed or operated in a particular orientation. In addition, terms such as "first" and "second" are used herein for purposes of description and are not intended to indicate or imply relative importance or significance or to imply the number of indicated technical features. Thus, the feature defined with "first" and "second" may comprise one or more of this feature. In the description of the present disclosure, "a plurality of" means two or more than two, unless specified otherwise.

[0023] In the present specification, unless specified and defined otherwise, it is to be illustrated that the terms "mounted," "connected," "coupled" and the like are used broadly, and may be, for example, fixed connections, detachable connections, or integral connections; may also be mechanical or electrical connections; may also be direct connections or indirect connections via intervening structures; may also be inner communications or interaction relation of two elements, which can be understood by those skilled in the art according to specific situations.

[0024] In the present disclosure, unless specified or limited otherwise, a structure in which a first feature is "on" or "below" a second feature may include an embodiment in which the first feature is in direct contact with the second feature, and may also include an embodiment in which the first feature and the second feature are not in direct contact with each other, but are contacted via an additional feature formed therebetween. Furthermore, a first feature "on," "above," or "on top of" a second feature may include an embodiment in which the first feature is right or obliquely "on," "above," or "on top of" the second feature, or just means that the first feature is at a height higher than that of the second feature; while a first feature "below," "under," or "on bottom of" a second feature may include an embodiment in which the first feature is right or obliquely "below," "under," or "on bottom of" the second feature, or just means that the first feature is at a height lower than that of the second feature.

[0025] Various embodiments and examples are provided in the following description to implement different structures of the present disclosure. In order to simplify the present disclosure, certain elements and settings will be described. However, these elements and settings are only by way of example and are not intended to limit the present disclosure. In addition, reference numerals may be repeated in different examples in the present disclosure. This repeating is for the purpose of simplification and clarity and does not refer to relations between different embodiments and/or settings. Furthermore, examples of different processes and materials are provided in the present disclosure. However, it would be appreciated by those skilled in the art that other processes and/or materials may be also applied.

[0026] Referring to Fig. 1 to Fig. 3, a hinge 10 having

a buffering effect according to a preferable embodiment of the present disclosure includes a first assembly 12, a second assembly 14, a main spring 16, a connecting piece 18, a damper assembly 20, a connecting assembly 22 and a locking spring 24. The first assembly 12 and the second assembly 14 are configured to be fixed to a device body and a drop-down door respectively and are rotatably connected by means of a first rotary shaft 142, so that the drop-down door may be rotatably pulled downwards with respect to the device body. The first assembly 12 is configured to be a rectangular casing and includes a first end 120 rotatably connected with the second assembly 14 and a second end 122 opposite to the first end 120. The first assembly 12 is provided with a first guiding groove 124 adjacent to the first end 120, and the second assembly 14 includes a cam portion 140. The main spring 16 is disposed in the first assembly 12 and has a first end fixedly connected with the second end 122. The connecting piece 18 is disposed in the first assembly 12. The connecting piece 18 is connected with a second end of the main spring 16 and further rotatably connected with the second assembly 14 by means of a second rotary shaft 26. The connecting piece 18 is provided with an upper cover 180 so as to be fitted with the first assembly 12 to form a cavity 182, and the connecting piece 18 is provided with a second guiding groove 184. The damper assembly 20 includes a damper body 200, an extending and retracting rod 202, a return spring 204, a position limiting piece 206 and a third rotary shaft 208. The damper body 200 is located in the cavity 182 and provided with a third guiding groove 20a. The extending and retracting rod 202 extends from the damper body 200 towards the second assembly 14. The return spring 204 is fitted over the extending and retracting rod 202 and disposed in the damper body 200. The position limiting piece 206 is fixed in the first assembly 12, and the position limiting piece 206 is penetrated by the extending and retracting rod 202. The third rotary shaft 208 connects the damper body 200 with the connecting piece 18. The third rotary shaft 208 is rotatably and slidably disposed in the second guiding groove 184 and the third guiding groove 20a. The connecting assembly 22 is disposed between the second assembly 14 and the extending and retracting rod 202. The connecting assembly 22 is fixedly connected with the extending and retracting rod 202. The connecting assembly 22 is connected with the connecting piece 18 by means of a fourth rotary shaft 28. The fourth rotary shaft 28 is rotatably and slidably disposed in the first guiding groove 124. The connecting assembly 22 includes a driven pulley 220. The locking spring 24 is fitted over the extending and retracting rod 202 and disposed between the position limiting piece 206 and the connecting assembly 22, so that the driven pulley 220 may keep rotatable contact with the cam portion 140. The cam portion 140 has a balanced stage, a critical stage and a buffered-closing stage in a rotation process of the second assembly 14 from a position where a largest opening angle is formed between the first assembly 12 and the second

assembly 14 to the first assembly 12, and the cam portion 140 is successively fitted with the driven pulley 220 in these stages. In the balanced stage, the locking spring 24 is in a compressed state and changes to a reset state, the return spring 204 is in a natural state, the damper body 200 is motionless in the cavity 182, the main spring 16 is in a stretched state and changes to a reset state, and a tensioning force produced by the main spring 16 is balanced with a load weight of the hinge 10. In the critical stage, the locking spring 24 is in the compressed state and changes to the reset state, the return spring 204 is in the natural state, the damper body 200 slides in the cavity 182 in a direction towards the second end 122, the main spring 16 is in the stretched state, and the tensioning force produced by the main spring 16 is larger than the load weight of the hinge 10. In the buffered-closing stage, the locking spring 24 is in the compressed state and changes to the reset state, the return spring 204 is in the natural state, the extending and retracting rod 202 is retracted into the damper body 200, the main spring 16 is in the stretched state and changes to the reset state, the tensioning force produced by the main spring 16 is larger than the load weight of the hinge 10 and the damper body 200 has a reverse buffering effect.

[0027] In the hinge according to preferable embodiments of the present disclosure, as the main spring 16 is adopted, it is possible to balance a weight of the drop-down door when pulling the drop-down door downwards, thus realizing stable opening and stable closing. In addition, as the locking spring 24 and the damper assembly 20 are adopted, the drop-down door may be closed automatically and slowly, thus improving a using experience of a user.

[0028] Referring to Fig. 4, in the present embodiment, the first assembly 12 has a substantially rectangular shape. The first assembly 12 includes the first end 120 and the second end 122 opposite to the first end 120. The first assembly 12 further includes a bottom plate 126 and side walls 128 extending upwards from two sides of the bottom plate 126 respectively. The first guiding groove 124 is formed in each of the two side walls 128 and has an arc shape, and extends substantially along a length direction of the first assembly 12. The first guiding groove 124 includes a first end point 1240 and a second end point 1242 opposite to the first end point 1240.

[0029] Thus, it is possible to coordinate a moving track of the connecting assembly 22 by adopting the arc-shaped first guiding groove 124.

[0030] Referring to Fig. 5, specifically, the main spring 16, the connecting piece 18, the damper assembly 20, the connecting assembly 22 and the locking spring 24 are accommodated in the first assembly 12. The first assembly 12 has a groove 128a in the bottom plate 126 adjacent to the first end 120, and the groove 128a is parallel with an axial direction of the first assembly 12. The groove 128a has a U shape. The first assembly 12 and the second assembly 14 are connected by means of the first rotary shaft 142 at the first end 120. The first

assembly 12 is configured to rotate relative to the second assembly 14 around the first rotary shaft 142 and also to drive the connecting piece 18 to move synchronously. The second assembly 14 is configured to swing in the groove 128a relative to the first assembly 12. The first assembly 12 is connected with a fifth rotary shaft 30 at the second end 122, and the fifth rotary shaft 30 is parallel with the first rotary shaft 142. A tail end of the connecting piece 18 away from the first end 120 is connected with a connecting shaft 32 parallel with the fifth rotary shaft 30. The main spring 16 is connected with the fifth rotary shaft 30 and the connecting shaft 32. The second assembly 14 is connected to a stepped piece 36 by means of a sixth rotary shaft 34 parallel with the second rotary shaft 26. The stepped piece 36 includes a fifth side 360 and a sixth side 362 opposite to the fifth side 360. The second assembly 14 is located between the fifth side 360 and the sixth side 362. The sixth rotary shaft 34 passes through the fifth side 360 and the sixth side 362 to be connected with the second assembly 14. The fifth side 360 and the sixth side 362 are connected and joint by means of a first step surface 364. Above the first step surface 364, the fifth side 360 and the sixth side 362 are connected and joint by means of a second step surface 366. The stepped piece 36 has a U shape, and the first step surface 364 and the second step surface 366 forms a stepped shape. The first step surface 364 is configured to be wedged in the groove 128a, and the second step surface 366 is configured to abut against the bottom plate 126 of the first assembly 12.

[0031] Referring to Fig. 6, in the present embodiment, the connecting piece 18 is accommodated in the first assembly 12 and includes two side sheets 186 and the upper cover 180 jointed to the two side sheets 186. The two side sheets 186 are tightly attached to the two side walls 128 of the first assembly 12 respectively. The upper cover 180 is parallel with the bottom plate 126 of the first assembly 12, the upper cover 180 is fitted with the first assembly 12 to form the cavity 182, and the damper body 200 is configured to slide in the cavity 182. The second assembly 14 is configured to have a sheet shape, located in the connecting piece 18, and extends into the groove 128a. The connecting piece 18 and the second assembly 14 are connected by means of the second rotary shaft 26 parallel with the first rotary shaft 142. The connecting piece 18 connects the main spring 16 with the second assembly 14, and a connecting point of the connecting piece 18 and the second assembly 14 deviates from the first rotary shaft 142 of the second assembly 14, so that the second assembly 14 may drive the connecting piece 18 to move when the second assembly 14 rotates relative to the first assembly 12, so as to stretch the main spring 16.

[0032] Thus, the connecting piece 18 provided with the upper cover 180 performs a position limitation to the damper body 200.

[0033] In the present embodiment, the cavity 182 has a rectangular shape, the damper body 200 has a cylin-

dricial shape, and shapes of the damper body 200 and the cavity 182 are matched with each other so as to enable the damper body 200 to slide in the cavity 182.

[0034] In the present embodiment, the position limiting piece 206 has an L shape and includes a bottom sheet 206a fixedly connected with the bottom plate 126 and a blocking sheet 206b extending upwards from the bottom sheet 206a, and the blocking sheet 206b is penetrated by the extending and retracting rod 202.

[0035] Thus, the position limiting piece 206 performs a position limitation to the damper body 200. The connecting piece 18, the position limiting piece 206 and the third rotary shaft 208 cooperate to define a moving range of the damper body 200, thus proving a simple structure and convenient assembling and disassembling.

[0036] Specifically, the connecting piece 18, the position limiting piece 206 and the third rotary shaft 208 disposed in the second guiding groove 184 and the third guiding groove 20a define a sliding travel of the damper body 200. A position limitation of the damper body 200 is performed by means of the connecting piece 18, the position limiting piece 206 and the third rotary shaft 208. The damper body 200 is configured to move in an axial length range of the third guiding groove 20a in a linear and reciprocating manner. When the drop-down door is opened to a largest angle, the third rotary shaft 208 is located at a rightmost end of the third guiding groove 20a. The extending and retracting rod 202 extends from the damper body 200, and a tail end of the extending and retracting rod 202 is fixed with the connecting assembly 22 by means of a threaded pin 38. The damper body 200 is configured as a hydraulic damper.

[0037] Referring to Fig. 7, in the present embodiment, the connecting assembly 22 includes a connecting body 222 and the driven pulley 220 disposed to the connecting body 222, and the connecting body 222 is fixedly connected with the extending and retracting rod 202. The connecting body 222 and the connecting piece 18 are connected by means of the fourth rotary shaft 28 slidably disposed in the first guiding groove 124. The connecting body 222 is provided with a fixed shaft 2220, the driven pulley 220 has an annular shape and is fitted over the fixed shaft 2220, and the driven pulley 220 keeps contacting the cam portion 140. The driven pulley 220 may rotate with treating the fourth rotary shaft 28 as its axis, and thus it is guaranteed that the driven pulley 220 keeps contacting the cam portion 140 constantly. The connecting body 222 includes a third side 2222, a fourth side 2224 opposite to the third side 2222, and a blocking surface 2226 perpendicular to the third side 2222 and the fourth side 2224 and located between the third side 2222 and the fourth side 2224. The fixed shaft 2220 is formed between the third side 2222 and the fourth side 2224. The blocking surface 2226 has a hole 2228 in a center thereof, and the hole 2228 is configured to be fitted with the extending and retracting rod 202. The extending and retracting rod 202 rightly passes through the hole 2228, and the threaded pin 38 mounted to the extending and

retracting rod 202 blocks the blocking surface 2226. The connecting body 222 is formed integrally, and the cam portion 140 has concave and convex portions having various contacts with the driven pulley 220.

[0038] Accordingly, the connecting piece 18 and the connecting assembly 22 are connected by means of the fourth rotary shaft 28 and the fourth rotary shaft 28 is slidably disposed in the first guiding groove 124. The connecting piece 18 drives the fourth rotary shaft 28 to slide in the first guiding groove 124.

[0039] The first assembly 12 is disposed to the drop-down door, and the second assembly 14 is disposed to the device body. When the hinge 10 operates, a position of the second assembly 14 is constant, and the first assembly 12 may rotate around the first rotary shaft 142 by a certain angle and drive the connecting piece 18 connected to the second assembly 14 to move synchronously, so that the main spring 16 connected to the connecting piece 18 may be stretched. Under actions of the main spring 16 and the damper assembly 20, the drop-down door may be closed automatically and slowly.

[0040] Specifically, the balanced stage represents that the hinge 10 transfers from a position n1 to a position n2, the critical stage represents that the hinge 10 transfers from the position n2 to a position n3, and the buffered-closing stage represents that the hinge 10 transfers from the position n3 to a position n4. When the second assembly 14 is located at the position n1 with respect to the first assembly 12, the hinge 10 has the largest opening angle, and the drop-down door is opened to the largest angle. When the second assembly 14 is located at the position n4 with respect to the first assembly 12, the hinge 10 has a smallest opening angle and a door body is in a closed state.

[0041] When the second assembly 14 is located at the position n1 with respect to the first assembly 12, the connecting piece 18 drives the fourth rotary shaft 28 to reach the first end point 1240, the third rotary shaft 208 is located at a right end of the third guiding groove 20a, the main spring 16 is stretched by the connecting piece 18 so as to be in the stretched state, and the tensioning force of the main spring 16 is balanced with the load weight of the hinge 10. When the hinge 10 operates in an angle a, i.e. in the balanced stage from the position n1 to the position n2, as the tensioning force of the main spring 16 is balanced with the load weight of the hinge 10, the drop-down door may be motionless at any position in this range, in which case an external force of human is required for closing the drop-down door.

[0042] When the second assembly 14 is located at the position n2 with respect to the first assembly 12, the tensioning force of the main spring 16 is larger than the load weight of the hinge 10. When the hinge 10 operates in an angle b, i.e. in the critical stage from the position n2 to the position n3, the connecting piece 18 connected with the main spring 16 slides in a direction towards the main spring 16, and hence the damper body 200 slides, so that the third rotary shaft 208 slides towards a leftmost

end of the third guiding groove 20a, i.e. the hinge 10 may automatically drive the drop-down door to rotate rapidly in a closing direction, in which case the drop-down door may be closed automatically without the external force.

[0043] When the second assembly 14 is located at the position n3 with respect to the first assembly 12, the tensioning force of the main spring 16 is larger than the load weight of the hinge 10, the third rotary shaft 208 is located at the leftmost end of the third guiding groove 20a, and the return spring 204 restores to the natural state from the compressed state. When the hinge 10 operates in an angle c, i.e. in the buffered-closing stage from the position n3 to the position n4, the connecting piece 18 connected with the main spring 16 continues sliding in the direction towards the main spring 16, the extending and retracting rod 202 starts to be retracted into the damper body 200, and hence the damper body 200 generates a reverse buffering force, so as to slow down a rotation speed of the door body driven by the hinge 10, so that the drop-down door rotates in a slow and uniform speed, in which case the drop-down door may be closed automatically in a gentle manner, instead of being rebounded rapidly.

[0044] When the second assembly 14 is located at the position n4 with respect to the first assembly 12, the hinge 10 has the smallest opening angle, and the door body is in the closed state. In this case, the main spring 16, the locking spring 24 and the return spring 204 are all in the natural state.

[0045] When the hinge 10 is opened from the position n4 to any position in a range of the angle C under an action of an external force (which is usually applied by human), the damper body 200 slides in a direction towards the second assembly 14, and the return spring 204 applies a resistance force to the damper body 200 to allow a hydraulic oil in the damper body 200 to reset. When the external force is withdrawn, as the tensioning force of the main spring 16 is larger than the load weight of the hinge 10, the drop-down door rotates in a direction towards the main spring 16, that is, the drop-down door will still be closed in a slow and uniform speed, i.e. the hinge 10 will still return to the position n4.

[0046] In the present embodiment, corresponding to the balanced stage, the hinge 10 is located at a position between the position n1 and the position n2, in which case the tensioning force produced by the main spring 16 is balanced with the load weight of the hinge 10, and thus the drop-down door may be stopped at any position in a range of the angle a. Corresponding to the balanced stage, the drop-down door is configured to rotate by an angle of 50°-70°, that is, the range of the angle a is 50°-70°.

[0047] In the present embodiment, corresponding to the critical stage, the hinge 10 is located at a position between the position n2 and the position n3, in which case the tensioning force produced by the main spring 16 is larger than the load weight of the hinge 10, and thus the hinge may rotate from the position n2 to the position n3 rapidly in a range of the angle b. Corresponding to

the critical stage, the drop-down door is configured to rotate by an angle of 10°-15°, that is, the range of the angle b is 10°-15°.

[0048] In the present embodiment, corresponding to the buffered-closing stage, the hinge 10 is located at a position between the position n3 and the position n4, in which case the tensioning force produced by the main spring 16 is larger than the load weight of the hinge 10, and thus the hinge may rotate from the position n3 to the position n4 slowly in the range of the angle c. Corresponding to the buffered-closing stage, the drop-down door is configured to rotate by an angle of 10°-25°, that is, the range of the angle c is 10°-25°.

[0049] Thus, the drop-down door may be closed automatically and slowly in a designed angle range, thus improving the using experience of the user.

[0050] Certainly, numerical values above are provided as examples, so as to aid in illustrating a manner in which the automatic and slow closing of the drop-down door in a certain opening and closing angle is realized by means of the hinge 10, but are not used to limit the present disclosure.

[0051] A device in a preferable embodiment of the present disclosure includes a device body and a drop-down door. The device includes the above hinge 10. The first assembly 12 is fixedly disposed to the drop-down door, and the second assembly 14 is fixedly disposed to the device body. Optionally, the device is an oven. Certainly, the oven only serves as an example, but is not used to limit the present disclosure. Thus, the drop-down door of the device may be closed automatically and slowly, which prevents the drop-down door of the device from being damaged due to a rapid closing caused by over-exertion.

[0052] Reference throughout this specification to "an embodiment," "some embodiments," "an illustrative embodiment" "an example," "a specific example," or "some examples," means that a particular feature, structure, material, or characteristic described in connection with the embodiment or example is included in at least one embodiment or example of the present disclosure. Thus, the appearances of the phrases in various places throughout this specification are not necessarily referring to the same embodiment or example of the present disclosure. Furthermore, the particular features, structures, materials, or characteristics may be combined in any suitable manner in one or more embodiments or examples.

[0053] Although embodiments of the present disclosure have been shown and illustrated, it shall be understood by those skilled in the art that various changes, modifications, alternatives and variants without departing from the principle and intention of the present disclosure are acceptable. The scope of the present disclosure is defined by the claims .

Claims

1. A hinge (10) having a buffering effect, comprising:

a first assembly (12) and a second assembly (14) rotatably connected by means of a first rotary shaft (142), the first assembly (12) comprising a first end (120) rotatably connected with the second assembly (14) and a second end (122) opposite to the first end (120), the first assembly (12) having a first guiding groove (124) adjacent to the first end (120), the second assembly (14) being provided with a cam portion (140);
 a main spring (16) disposed in the first assembly (12), a first end of the main spring (16) being fixedly connected with the second end (122) of the first assembly (12);
 a connecting piece (18) disposed in the first assembly (12), connected with a second end of the main spring (16) and further rotatably connected with the second assembly (14) by means of a second rotary shaft (26), the connecting piece (18) being provided with an upper cover (180) so as to be fitted with the first assembly (12) to form a cavity (182), the connecting piece (18) having a second guiding groove (184);
 a damper assembly (20), comprising:
 a damper body (200) located in the cavity (182) and having a third guiding groove (20a);
 an extending and retracting rod (202) extending from the damper body (200) towards the second assembly (14);
 a return spring (204) fitted over the extending and retracting rod (202) and disposed in the damper body (200);
 a position limiting piece (206) fixed in the first assembly (12) and penetrated by the extending and retracting rod (202); and
 a third rotary shaft (208) connecting the damper body (200) with the connecting piece (18); a connecting assembly (22) disposed between the second assembly (14) and the extending and retracting rod (202), the connecting assembly (22) being fixedly connected with the extending and retracting rod (202), the connecting assembly (22) being connected with the connecting piece (18) by means of a fourth rotary shaft (28), the fourth rotary shaft (28) being rotatably and slidably disposed in the first guiding groove (124), the connecting assembly (22) comprising a driven pulley (220); and
 a locking spring (24) fitted over the extending and retracting rod (202) and disposed between the position limiting piece (206) and the connecting assembly (22) so as to allow the driven pulley

(220) to keep rotatable contact with the cam portion (140),

wherein the cam portion (140) has a balanced stage, a critical stage and a buffered-closing stage in a rotation process of the second assembly (14) from a position where a largest opening angle is formed between the first assembly (12) and the second assembly (14) to the first assembly (12), and the cam portion (140) is successively fitted with the driven pulley (220) in these stages;

in the balanced stage, the locking spring (24) is in a compressed state and changes to a reset state, the return spring (204) is in a natural state, the damper body (200) is motionless in the cavity (182), the main spring (16) is in a stretched state and changes to a reset state, and a tensioning force produced by the main spring (16) is balanced with a load weight of the hinge (10);

in the critical stage, the locking spring (24) is in the compressed state and changing to the reset state, the return spring (204) is in the natural state, the damper body (200) slides in the cavity (182) in a direction towards the second end (122), the main spring (16) is in the stretched state, and the tensioning force produced by the main spring (16) is larger than the load weight of the hinge (10);

in the buffered-closing stage, the locking spring (24) is in the compressed state and changes to the reset state, the return spring (204) is in the natural state, the extending and retracting rod (202) is retracted into the damper body (200), the main spring (16) is in the stretched state and changes to the reset state, the tensioning force produced by the main spring (16) is larger than the load weight of the hinge (10) and the damper body (200) generates a reverse buffering effect **characterized in that**

the third rotary shaft (208) connecting the damper body (200) with the connecting piece (18) is rotatably and slidably disposed in the second guiding groove (184) and the third guiding groove (20a).

2. The hinge (10) having the buffering effect according to claim 1, wherein the first assembly (12) comprises a bottom plate (126) and side walls (128) extending upwards from two sides of the bottom plate (126), and the first guiding groove (124) is formed in each of the two side walls (128) and has an arc shape.
3. The hinge (10) having the buffering effect according to claim 2, wherein the connecting piece (18) comprises two side sheets (186) tightly attached to the side walls (128) respectively and the upper cover (180) joint to the two side sheets (186).

4. The hinge (10) having the buffering effect according to claim 1, wherein the cavity (182) has a rectangular shape, the damper body (200) has a cylindrical shape, and shapes of the damper body (200) and the cavity (182) are matched with each other so as to allow the damper body (200) to slide in the cavity (182). 5
5. The hinge (10) having the buffering effect according to claim 2, wherein the position limiting piece (206) has an L shape, the position limiting piece (206) comprises a bottom sheet (206a) fixedly connected with the bottom plate (126) and a blocking sheet (206b) extending upwards from the bottom sheet (206a), and the blocking sheet (206b) is penetrated by the extending and retracting rod (202). 10 15
6. The hinge (10) having the buffering effect according to claim 1, wherein the connecting assembly (22) comprises a connecting body (222) fixedly connected with the extending and retracting rod (202) and the driven pulley (220) disposed to the connecting body (222), the connecting body (222) and the connecting piece (18) are connected by means of the fourth rotary shaft (28) slidably disposed in the first guiding groove (124), the connecting body (222) is provided with a fixed shaft (2220), the driven pulley (220) has an annular shape and is fitted over the fixed shaft (2220), and the driven pulley (220) keeps being rotatably connected with the cam portion (140). 20 25 30
7. The hinge (10) having the buffering effect according to any one of claims 1 to 6, wherein corresponding to the balanced stage, a drop-down door is configured to rotate by an angle (a) of 50°-70°. 35
8. The hinge (10) having the buffering effect according to any one of claims 1 to 6, wherein corresponding to the critical stage, a drop-down door is configured to rotate by an angle (b) 10°-15°. 40
9. The hinge (10) having the buffering effect according to any one of claims 1 to 6, wherein corresponding to the buffered-closing stage, a drop-down door is configured to rotate by an angle (c) of 10°-25°. 45
10. The hinge (10) having the buffering effect according to claim 1, wherein the first assembly (12) is configured as a rectangular casing. 50
11. A device, comprising a device body, a drop-down door and a hinge (10) configured for the device according to any one of claims 1 to 10, the first assembly (12) and the second assembly (14) of the hinge (10) are configured to be fixed to the device body and the drop-down door respectively and are rotatably connected by means of a first rotary shaft (142), 55

so that the drop-down door is configured to be rotatably pulled downwards with respect to the device body.

Patentansprüche

1. Scharnier (10) aufweisend eine Pufferwirkung, umfassend:

eine erste Anordnung (12) und eine zweite Anordnung (14), die mittels einer ersten Drehwelle (142) drehbar verbunden sind, wobei die erste Anordnung (12) ein mittels der ersten Drehwelle (142) drehbar mit der zweiten Anordnung (14) verbundenes erstes Ende (120) und ein dem ersten Ende (120) gegenüberliegendes zweites Ende (122) umfasst, wobei die erste Anordnung (12) eine zum ersten Ende (120) benachbarte erste Führungsnut (124) aufweist, wobei die zweite Anordnung (14) mit einem Nockenbereich (140) versehen ist;

eine Hauptfeder (16), die in der ersten Anordnung (12) angeordnet ist, wobei ein erstes Ende der Hauptfeder (16) fest mit dem zweiten Ende (122) der ersten Anordnung (12) verbunden ist; ein Verbindungsstück (18), das in der ersten Anordnung (12) angeordnet ist, mit einem zweiten Ende der Hauptfeder (16) verbunden ist und ferner mittels einer zweiten Drehwelle (26) drehbar mit der zweiten Anordnung (14) verbunden ist, wobei das Verbindungsstück (18) mit einer oberen Abdeckung (180) versehen ist, um an die erste Anordnung (12) angepasst zu sein, um einen Hohlraum (182) zu bilden, wobei das Verbindungsstück (18) eine zweite Führungsnut (184) aufweist;

eine Dämpferanordnung (20), umfassend:

einen Dämpferkörper (200), der sich in dem Hohlraum (182) befindet und eine dritte Führungsnut (20a) aufweist;

eine ausfahrende und einfahrende Stange (202), die sich von dem Dämpferkörper (200) zu der zweiten Anordnung (14) hin erstreckt;

eine Rückstellfeder (204), die über die ausfahrende und einfahrende Stange (202) eingepasst und in dem Dämpferkörper (200) angeordnet ist;

ein Positionsbegrenzungsstück (206), das in der ersten Anordnung (12) befestigt ist und von der ausfahrenden und einfahrenden Stange (202) durchdrungen wird; und eine dritte Drehwelle (208), die den Dämpferkörper (200) mit dem Verbindungsstück (18) verbindet; eine Verbindungsanordnung (22), die zwischen der zweiten Anord-

nung (14) und der ausfahrenden und einfahrenden Stange (202) angeordnet ist, wobei die Verbindungsanordnung (22) fest mit der ausfahrenden und einfahrenden Stange (202) verbunden ist, wobei die Verbindungsanordnung (22) mittels einer vierten Drehwelle (28) mit dem Verbindungsstück (18) verbunden ist, wobei die vierte Drehwelle (28) drehbar und verschiebbar in der ersten Führungsnut (124) angeordnet ist, wobei die Verbindungsanordnung (22) eine angetriebene Riemenscheibe (220) umfasst; und

eine Verriegelungsfeder (24), die über die ausfahrende und einfahrende Stange (202) eingepasst und zwischen dem Positionsbegrenzungsstück (206) und der Verbindungsanordnung (22) angeordnet ist, um zu ermöglichen, dass die angetriebene Riemenscheibe (220) drehbaren Kontakt mit dem Nockenbereich (140) hält, wobei der Nockenbereich (140) eine ausgeglichene Stufe, eine kritische Stufe und eine gepufferte Schließstufe in einem Rotationsprozess der zweiten Anordnung (14) von einer Position, wo ein größter Öffnungswinkel zwischen der ersten Anordnung (12) und der zweiten Anordnung (14) ausgebildet wird, zu der ersten Anordnung (12) aufweist, und der Nockenbereich (140) in diesen Stufen sukzessive an die angetriebene Riemenscheibe (220) angepasst wird; in der ausgeglichenen Stufe befindet sich die Verriegelungsfeder (24) in einem komprimierten Zustand und wechselt in einen Rückstellzustand, die Rückstellfeder (204) befindet sich in einem natürlichen Zustand, der Dämpferkörper (200) befindet sich bewegungslos in dem Hohlraum (182), die Hauptfeder (16) befindet sich in einem gestreckten Zustand und wechselt in einen Rückstellzustand, und eine von der Hauptfeder (16) erzeugte Spannkraft wird mit einem Belastungsgewicht des Scharniers (10) ausgeglichen;

in der kritischen Stufe befindet sich die Verriegelungsfeder (24) im komprimierten Zustand und wechselt in den Rückstellzustand, die Rückstellfeder (204) befindet sich im natürlichen Zustand, der Dämpferkörper (200) gleitet im Hohlraum (182) in Richtung auf das zweite Ende (122), die Hauptfeder (16) befindet sich im gestreckten Zustand, und die von der Hauptfeder (16) erzeugte Spannkraft ist größer als das Belastungsgewicht des Scharniers (10);

in der gepufferten Schließstufe befindet sich die Verriegelungsfeder (24) im komprimierten Zustand und wechselt in den Rückstellzustand, die Rückstellfeder (204) befindet sich im natürlichen Zustand, die ausfahrende und einfahrende Stange (202) ist in den Dämpferkörper (200) eingefahren, die Hauptfeder (16) befindet sich im gestreckten Zustand und wechselt in den Rückstellzustand, die von der Hauptfeder (16) erzeugte Spannkraft ist größer als das Belastungsgewicht des Scharniers (10) und der Dämpferkörper (200) erzeugt eine umgekehrte Pufferwirkung,

wobei

die dritte Drehwelle (208), die den Dämpferkörper (200) mit dem Verbindungsstück (18) verbindet, drehbar und verschiebbar in der zweiten Führungsnut (184) und der dritten Führungsnut (20a) angeordnet ist;

2. Scharnier (10) aufweisend die Pufferwirkung gemäß Anspruch 1, wobei die erste Anordnung (12) eine Bodenplatte (126) und Seitenwände (128) umfasst, die sich von zwei Seiten der Bodenplatte (126) nach oben erstrecken, und die erste Führungsnut (124) in jeder der beiden Seitenwände (128) ausgebildet ist und eine bogenförmige Form aufweist.
3. Scharnier (10) aufweisend die Pufferwirkung gemäß Anspruch 2, wobei das Verbindungsstück (18) zwei jeweils fest an den Seitenwänden (128) befestigte Seitenbleche (186) und die mit den zwei Seitenblechen (186) verbundene obere Abdeckung (180) umfasst.
4. Scharnier (10) aufweisend die Pufferwirkung gemäß Anspruch 1, wobei der Hohlraum (182) eine rechteckige Form aufweist, der Dämpferkörper (200) eine zylindrische Form aufweist, und die Formen des Dämpferkörpers (200) und des Hohlraums (182) aufeinander abgestimmt sind, um ein Gleiten des Dämpferkörpers (200) im Hohlraum (182) zu ermöglichen.
5. Scharnier (10) aufweisend die Pufferwirkung gemäß Anspruch 2, wobei das Positionsbegrenzungsstück (206) eine L-Form aufweist, das Positionsbegrenzungsstück (206) ein fest mit der Bodenplatte (126) verbundenes Bodenblech (206a) und ein sich von dem Bodenblech (206a) nach oben erstreckendes Blockierblech (206b) umfasst, und das Blockierblech (206b) von der ausfahrenden und einfahrenden Stange (202) durchdrungen wird.
6. Scharnier (10) aufweisend die Pufferwirkung gemäß Anspruch 1, wobei die Verbindungsanordnung (22) einen Verbindungskörper (222) umfasst, der fest mit der ausfahrenden und einfahrenden Stange (202) und der an dem Verbindungskörper (222) angeordneten Zustand und wechselt in den Rückstellzustand, die Rückstellfeder (204) befindet sich im natürlichen Zustand, die ausfahrende und einfahrende Stange (202) ist in den Dämpferkörper (200) eingefahren, die Hauptfeder (16) befindet sich im gestreckten Zustand und wechselt in den Rückstellzustand, die von der Hauptfeder (16) erzeugte Spannkraft ist größer als das Belastungsgewicht des Scharniers (10) und der Dämpferkörper (200) erzeugt eine umgekehrte Pufferwirkung,

- neten angetriebenen Riemenscheibe (202) verbunden ist, der Verbindungskörper (222) und das Verbindungsstück (18) mittels der verschiebbar in der ersten Führungsnut (124) angeordneten vierten Drehwelle (28) verbunden sind, der Verbindungskörper (222) mit einer feststehenden Welle (2220) versehen ist, die angetriebene Riemenscheibe (220) eine ringförmig Form aufweist und über die feststehende Welle (2220) eingepasst ist, und die angetriebene Riemenscheibe (220) weiterhin drehbar mit dem Nockenbereich (140) verbunden ist. 5 10
7. Scharnier (10) aufweisend die Pufferwirkung gemäß einem der Ansprüche 1 bis 6, wobei entsprechend der ausgeglichenen Stufe eine herunterklappbare Tür so konfiguriert ist, dass sie sich um einen Winkel (a) von 50° bis 70° dreht. 15
8. Scharnier (10) aufweisend die Pufferwirkung gemäß einem der Ansprüche 1 bis 6, wobei entsprechend der kritischen Stufe eine herunterklappbare Tür so konfiguriert ist, dass sie sich um einen Winkel (b) von 10° bis 15° dreht. 20
9. Scharnier (10) aufweisend die Pufferwirkung gemäß einem der Ansprüche 1 bis 6, wobei entsprechend der gepufferten Schließstufe eine herunterklappbare Tür so konfiguriert ist, dass sie sich um einen Winkel (c) von 10° bis 25° dreht. 25 30
10. Scharnier (10) aufweisend die Pufferwirkung gemäß Anspruch 1, wobei die erste Anordnung (12) als rechteckiges Gehäuse ausgebildet ist. 30
11. Vorrichtung, umfassend einen Vorrichtungskörper, eine herunterklappbare Tür und ein für die Vorrichtung konfiguriertes Scharnier (10) gemäß einem der Ansprüche 1 bis 10, wobei die erste Anordnung (12) und die zweite Anordnung (14) des Scharniers (10) so konfiguriert sind, dass sie an dem Vorrichtungskörper bzw. der herunterklappbaren Tür befestigt sind und mittels einer ersten Drehwelle (142) drehbar verbunden sind, so dass die herunterklappbare Tür so konfiguriert ist, dass sie bezüglich des Vorrichtungskörpers drehbar nach unten gezogen wird. 35 40 45

Revendications

1. Charnière (10) présentant un effet amortisseur, comprenant : 50
- un premier ensemble (12) et un deuxième ensemble (14) reliés de façon rotative à l'aide d'un premier arbre rotatif (142), le premier ensemble (12) comprenant une première extrémité (120) reliée de façon rotative au deuxième ensemble (14) à l'aide du premier arbre rotatif (142) et une 55

deuxième extrémité (122) opposée à la première extrémité (120), le premier ensemble (12) présentant une première rainure de guidage (124) adjacente à la première extrémité (120), le deuxième ensemble (14) étant doté d'une partie de came (140) ;
un ressort principal (16) disposé dans le premier ensemble (12), une première extrémité du ressort principal (16) étant reliée fixement à la deuxième extrémité (122) du premier ensemble (12) ;
une pièce d'assemblage (18) disposée dans le premier ensemble (12), reliée à une deuxième extrémité du ressort principal (16) et également reliée de façon rotative au deuxième ensemble (14) à l'aide d'un deuxième arbre rotatif (26), la pièce d'assemblage (18) étant dotée d'un cache supérieur (180) de manière à être ajustée avec le premier ensemble (12) pour former une cavité (182), la pièce d'assemblage (18) présentant une deuxième rainure de guidage (184) ;
un ensemble d'amortisseur (20) comprenant :

un corps d'amortisseur (200) situé dans la cavité (182) et présentant une troisième rainure de guidage (20a) ;
une tige déployable et rétractable (202) s'étendant à partir du corps d'amortisseur (200) vers le deuxième ensemble (14) ;
un ressort de rappel (204) ajusté sur la tige déployable et rétractable (202) et disposé dans le corps d'amortisseur (200) ;
une pièce de limitation de position (206) fixée dans le premier ensemble (12) et pénétrée par la tige déployable et rétractable (202) ; et

un troisième arbre rotatif (208) reliant le corps d'amortisseur (200) à la pièce d'assemblage (18) ; un ensemble d'assemblage (22) disposé entre le deuxième ensemble (14) et la tige déployable et rétractable (202), l'ensemble d'assemblage (22) étant relié fixement à la tige déployable et rétractable (202), l'ensemble d'assemblage (22) étant relié à la pièce d'assemblage (18) à l'aide d'un quatrième arbre rotatif (28), le quatrième arbre rotatif (28) étant disposé de façon rotative et coulissante dans la première rainure de guidage (124), l'ensemble d'assemblage (22) comprenant une poulie entraînée (220) ; et
un ressort de blocage (24) ajusté sur la tige déployable et rétractable (202) et disposé entre la pièce de limitation de position (206) et l'ensemble d'assemblage (22) de manière à permettre à la poulie entraînée (220) de garder un contact rotatif avec la partie de came (140), dans laquelle la partie de came (140) présente

- un stade équilibré, un stade critique et un stade de fermeture amortie dans un processus de rotation du deuxième ensemble (14) à partir d'une position dans laquelle un angle d'ouverture maximal est formé entre le premier ensemble (12) et le deuxième ensemble (14), jusqu'au premier ensemble (12), et la partie de came (140) est ajustée successivement avec la poulie entraînée (220) à ces stades ;
- au stade équilibré, le ressort de blocage (24) est dans un état comprimé et passe à un état initial, le ressort de rappel (204) est dans un état naturel, le corps d'amortisseur (200) est immobile dans la cavité (182), le ressort principal (16) est dans un état étiré et passe à un état initial, et une force de tension produite par le ressort principal (16) est équilibrée avec un poids de charge de la charnière (10) ;
- au stade critique, le ressort de blocage (24) est dans l'état comprimé et passe à l'état initial, le ressort de rappel (204) est dans l'état naturel, le corps d'amortisseur (200) coulisse dans la cavité (182) dans une direction vers la deuxième extrémité (122), le ressort principal (16) est dans l'état étiré, et la force de tension produite par le ressort principal (16) est supérieure au poids de charge de la charnière (10) ;
- au stade de fermeture amortie, le ressort de blocage (24) est dans l'état comprimé et passe à l'état initial, le ressort de rappel (204) est dans l'état naturel, la tige déployable et rétractable (202) est rétractée dans le corps d'amortisseur (200), le ressort principal (16) est dans l'état étiré et passe à l'état initial, la force de tension produite par le ressort principal (16) est supérieure au poids de charge de la charnière (10) et le corps d'amortisseur (200) génère un effet amortisseur inverse,
- dans laquelle
- le troisième arbre rotatif (208) reliant le corps d'amortisseur (200) à la pièce d'assemblage (18) est disposé de façon rotative et coulissante dans la deuxième rainure de guidage (184) et la troisième rainure de guidage (20a).
2. Charnière (10) présentant l'effet amortisseur selon la revendication 1, dans laquelle le premier ensemble (12) comprend une plaque inférieure (126) et des parois latérales (128) s'étendant vers le haut à partir de deux côtés de la plaque inférieure (126), et la première rainure de guidage (124) est formée dans chacune des deux parois latérales (128) et présente une forme arquée.
 3. Charnière (10) présentant l'effet amortisseur selon la revendication 2, dans laquelle la pièce d'assemblage (18) comprend deux feuilles latérales (186) fixées étroitement aux parois latérales (128) respectivement et le cache supérieur (180) relié aux deux feuilles latérales (186).
 4. Charnière (10) présentant l'effet amortisseur selon la revendication 1, dans laquelle la cavité (182) présente une forme rectangulaire, le corps d'amortisseur (200) présente une forme cylindrique, et les formes du corps d'amortisseur (200) et de la cavité (182) sont adaptées l'une à l'autre de manière à permettre au corps d'amortisseur (200) de coulisser dans la cavité (182).
 5. Charnière (10) présentant l'effet amortisseur selon la revendication 2, dans laquelle la pièce de limitation de position (206) présente une forme en L, la pièce de limitation de position (206) comprend une feuille inférieure (206a) reliée fixement à la plaque inférieure (126) et une feuille de blocage (206b) s'étendant vers le haut à partir de la feuille inférieure (206a), et la feuille de blocage (206b) est pénétrée par la tige déployable et rétractable (202).
 6. Charnière (10) présentant l'effet amortisseur selon la revendication 1, dans laquelle l'ensemble d'assemblage (22) comprend un corps d'assemblage (222) relié fixement à la tige déployable et rétractable (202) et la poulie entraînée (220) disposée sur le corps d'assemblage (222), le corps d'assemblage (222) et la pièce d'assemblage (18) sont reliés à l'aide du quatrième arbre rotatif (28) disposé de façon coulissante dans la première rainure de guidage (124), le corps d'assemblage (222) est doté d'un arbre fixe (2220), la poulie entraînée (220) présente une forme annulaire et est ajustée sur l'arbre fixe (2220), et la poulie entraînée (220) continue d'être reliée de façon rotative à la partie de came (140).
 7. Charnière (10) présentant l'effet amortisseur selon l'une quelconque des revendications 1 à 6, dans laquelle une porte abattante est configurée pour tourner selon un angle (a) de 50° à 70°, correspondant au stade équilibré.
 8. Charnière (10) présentant l'effet amortisseur selon l'une quelconque des revendications 1 à 6, dans laquelle une porte abattante est configurée pour tourner selon un angle (b) de 10° à 15°, correspondant au stade critique.
 9. Charnière (10) présentant l'effet amortisseur selon l'une quelconque des revendications 1 à 6, dans laquelle une porte abattante est configurée pour tourner selon un angle (c) de 10° à 25°, correspondant au stade de fermeture amortie.
 10. Charnière (10) présentant l'effet amortisseur selon la revendication 1, dans laquelle le premier ensemble (12) est configuré comme un boîtier rectangulai-

re.

11. Dispositif comprenant un corps de dispositif, une porte abattante et une charnière (10) configurée pour le dispositif selon l'une quelconque des revendications 1 à 10, le premier ensemble (12) et le deuxième ensemble (14) de la charnière (10) étant configurés pour être fixés au corps de dispositif et à la porte abattante respectivement et reliés de façon rotative à l'aide d'un premier arbre rotatif (142), de telle façon que la porte abattante est configurée pour être tirée de façon rotative vers le bas par rapport au corps de dispositif.

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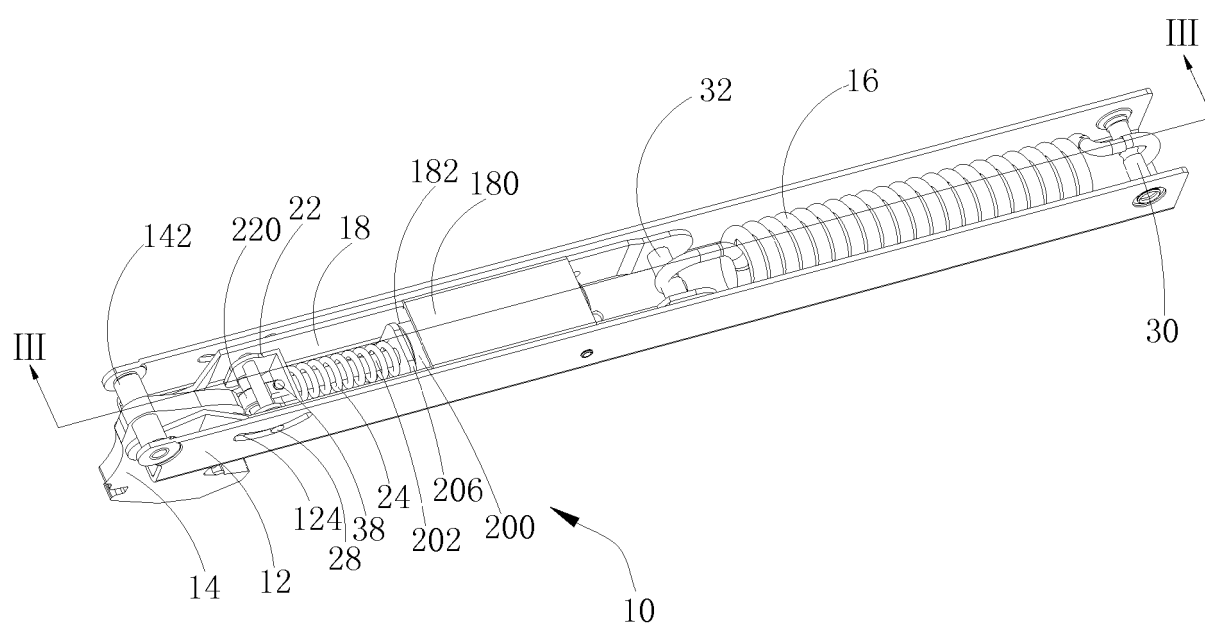


Fig. 1

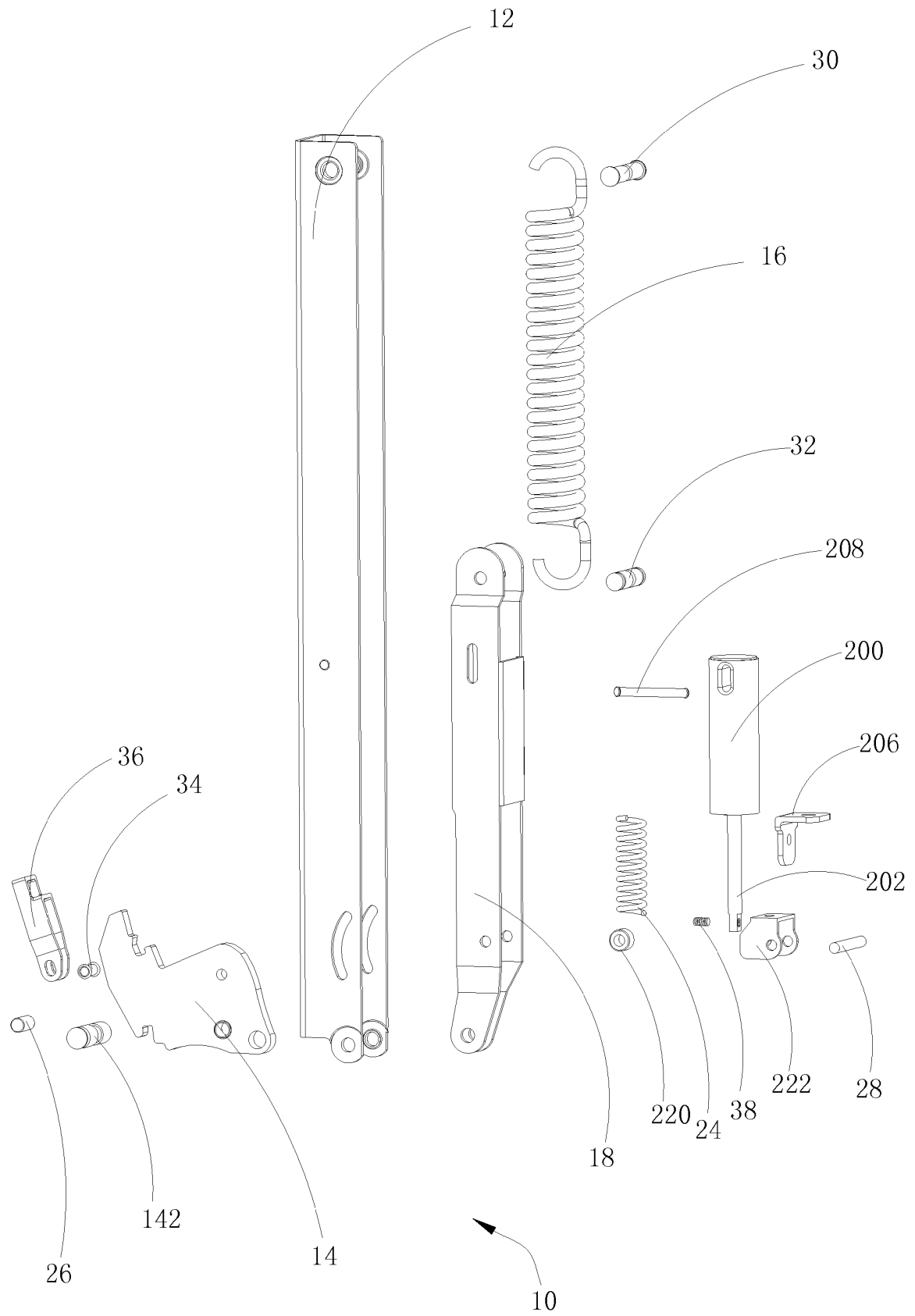


Fig. 2

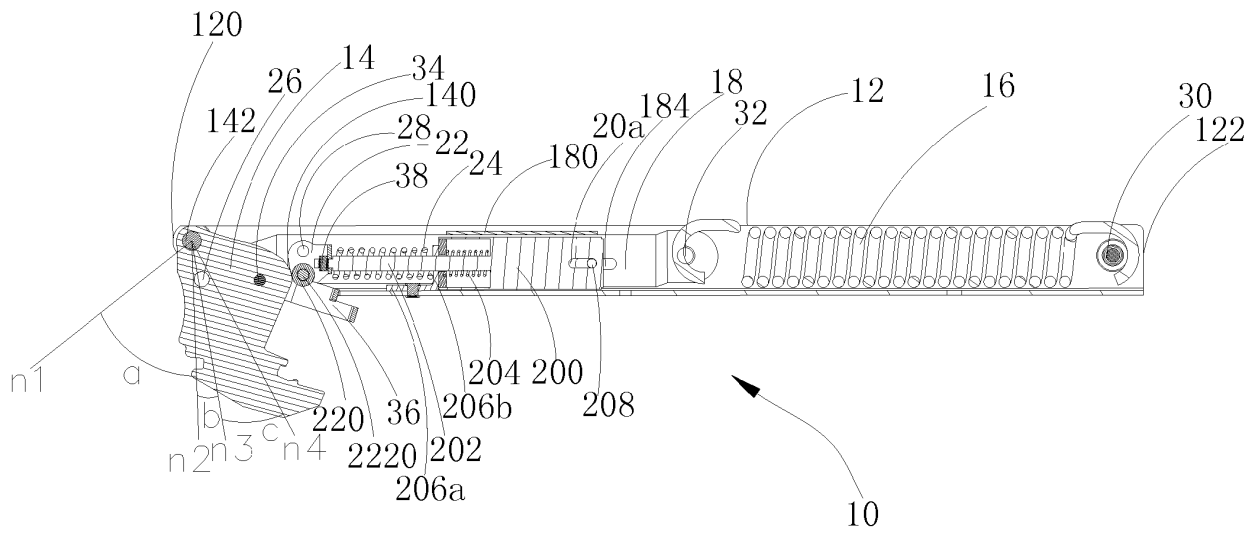


Fig. 3

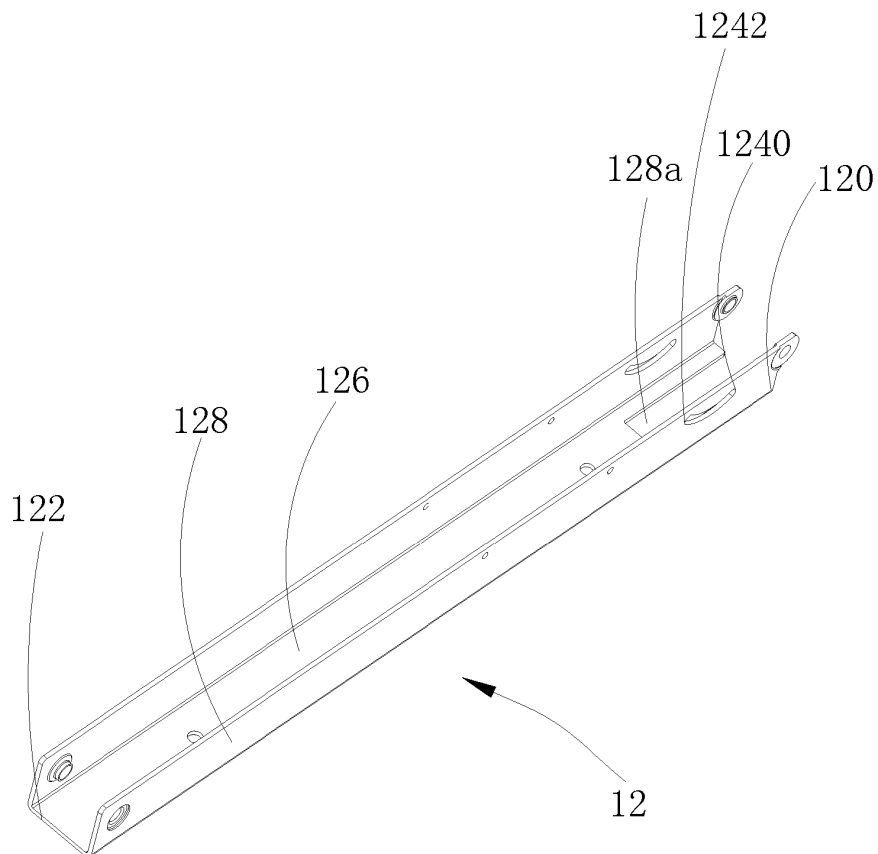


Fig. 4

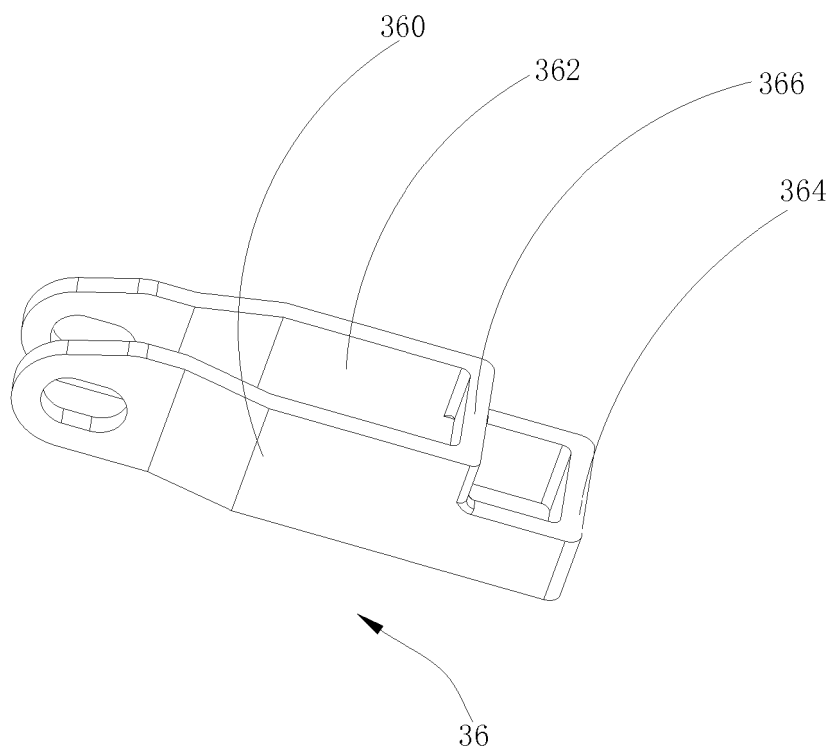


Fig. 5

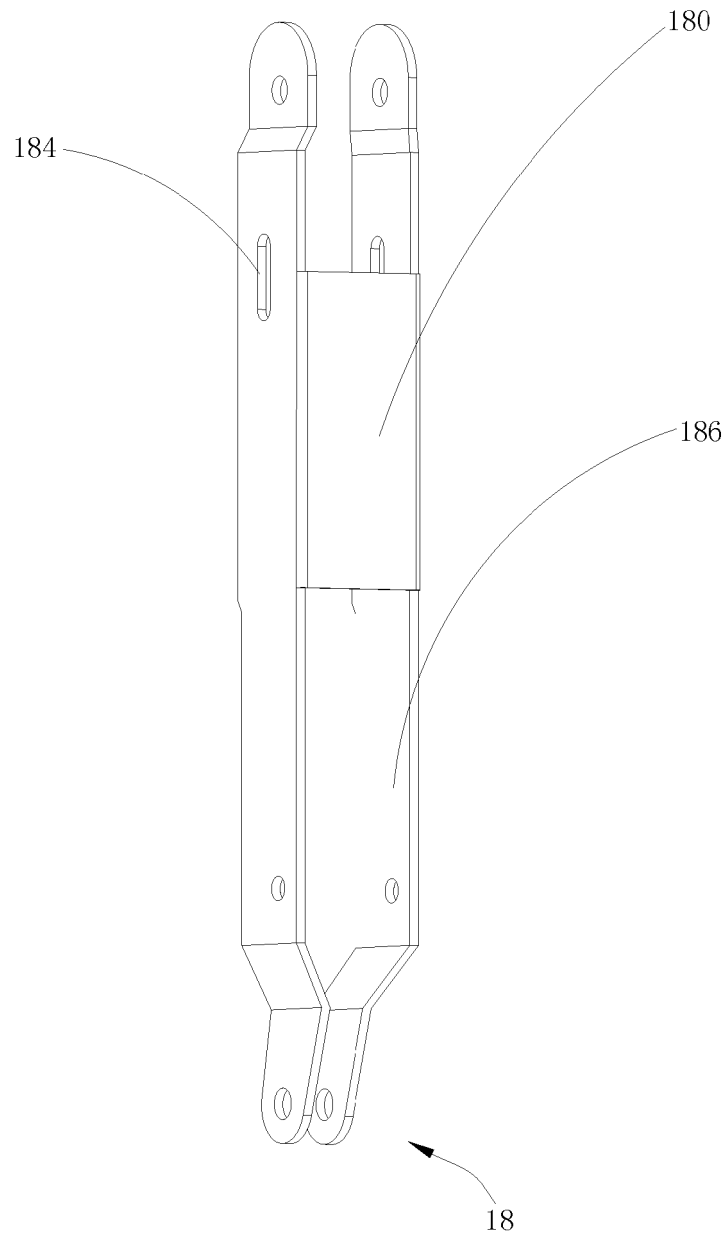


Fig. 6

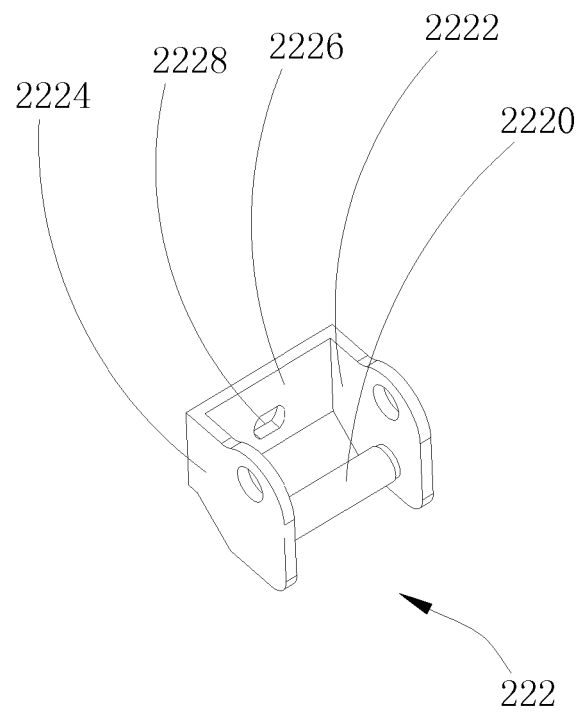


Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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