(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 857 779 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
20.12.2017 Bulletin 2017/51

(21) Application number: **13884952.6**

(22) Date of filing: **07.08.2013**

(51) Int Cl.:
F25D 23/02 *(2006.01)*

(86) International application number:
PCT/CN2013/080945

(87) International publication number:
WO 2015/017990 (12.02.2015 Gazette 2015/06)

(54) TURNOVER BEAM AND REFRIGERATOR PROVIDED WITH SAME

WENDEBALKEN UND KÜHLSCHRANK DAMIT

POUTRE ARTICULÉE ET RÉFRIGÉRATEUR LA CONTENANT

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(43) Date of publication of application:
08.04.2015 Bulletin 2015/15

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Description

TECHNICAL FIELD

[0001] The present invention relates to the technical fields of refrigerators, wine cabinets, beverage containers and freezers, and in particular, to a turnover beam for use in a refrigerator door and a refrigerator provided with the turnover beam, which is generally used the door a side-by-side door-equipped refrigerated compartment, a French refrigerator, and multi-door refrigerator, and a cross-like four-door refrigerator.

BACKGROUND

[0002] At present, conventional refrigerated compartments in the market are generally configured in refrigerators equipped with side-by-side doors, such as French refrigerators, multi-door refrigerators and the like. Typically a turnover beam capable of turning over at 90 degrees is designed on a refrigerator door on one side of the refrigerator. It is generally required that when the door is closed, the turnover beam is parallel to the door, and when the door is opened, the turnover beam is perpendicular to the door. It is a common practice that a torsion spring is used to ensure that the turnover beam is only maintained stable at either of the two positions, that is, a door open position or a door close position.

[0003] In the above design, the torsion spring is typically provided outside the turnover beam, thereby affecting appearance of the refrigerator. In addition, service life of the torsion spring is limited, and opening and closing during long-term use of the refrigerator may cause damages to the torsion spring, which resulting in failure of the turnover beam. During shift of the torsion spring between the two states, the torsion spring is definitely subjected to a dead center. In this case, if the design is not proper, the turnover beam may remain at the dead center, affecting normal use of the refrigerator.

[0004] Document JP H04 225774 A relates to a known door device for a refrigerator. In document WO 2009/109878 A1 a known household refrigerating appliance is described.

SUMMARY

[0005] The technical problem to be solved in the present invention is to provide a turnover beam featuring simple structure, convenient mounting and long service life, and a refrigerator provided with the turnover beam.

[0006] To solve the above technical problem, the present invention employs the following technical solution: a turnover beam, comprising: a front cover plate, a rear cover plate, a mount, and an elastic structure; wherein: the front cover plate and the rear cover plate mate with each other to form a cavity, the mount and the elastic structure being positioned in the cavity; the mount comprises a fixing position coupled to a refrigerator door and a rotating shaft hinged to a hole provided on the front cover plate, the rotating shaft being provided with a limiting stopper; and one end of the elastic structure is fixed into the cavity, and the other end of the elastic structure is a free end which elastically contacts with the limiting stopper, when the refrigerator door is at either of two limiting positions, the free end of the elastic structure being positioned on two sides of the limiting stopper, and when the refrigerator door is between the two limiting positions, the free end of the elastic structure being in elastic contact with the limiting stopper.

[0007] According to the present invention, the mount and the elastic structure are positioned inside the cavity, which causes no impact on the appearance and facilitates the mounting. In addition, the conventional torsion spring is replaced by contacting the elastic structure and the limiting stopper, and open and close states thereof are shifted by means of deformation and resilience of the elastic structure. Therefore, no "dead center" is caused and the service life is prolonged.

[0008] Specifically, the elastic structure is an elastic piece, the limiting stopper of the mount is of an arch structure, one end of the elastic structure is fixed onto the front cover plate, and the two limiting positions are a door close position and a door open position.

[0009] In addition, the present invention further provides a refrigerator, comprising: a cabinet, the cabinet being provided with at least one compartment, the compartment being provided with side-by-side doors; and at least one group of the above-mentioned turnover beams, the turnover beams being mounted on side surfaces of the doors.

[0010] The turnover beam is in parallel with the door when the door is closed, and the turnover beam is perpendicular to the door when the door is opened.

[0011] Compared with the prior art, the beneficial effects of the present disclosure lie in that:

[0012] According to the present invention, the mount and the elastic structure are positioned inside the cavity, which causes no impact on the appearance and facilitates the mounting. In addition, the conventional torsion spring is replaced by contacting of the elastic structure and the limiting stopper, and open and close states thereof are shifted by means of deformation and resilience of the elastic structure. Therefore, no "dead center" is caused and the service life is prolonged.

BRIEF DESCRIPTION OF DRAWINGS

[0013]

FIG. 1 is an exploded schematic structural view of a turnover beam according to the present invention;

FIG. 2 is a schematic structural view of a mount according to the present invention;

FIG. 3 is a schematic structural view of a combination of the mount and a front cover plate according to the present invention; and

FIGS. 4 to 6 are schematic structural views of the turnover beam from a door close state to a door open state according to the present invention.

DETAILED DESCRIPTION

[0014] The present invention is further described with reference to a specific embodiment.

[0015] As illustrated in FIG. 1, FIG. 2, and FIG. 3, an embodiment of the present invention provides a turnover beam, comprising: a front cover plate 1, a rear cover plate 2, a mount 3, and an elastic structure 4. The front cover plate 1 and the rear cover plate 2 mate with each other to form a cavity, wherein the mount 3 and the elastic structure 4 are positioned in the cavity. The mount 3 comprises a fixing position 32 coupled to a refrigerator door and a rotating shaft 31 hinged to a hole 11 provided on the front cover plate 1, wherein the rotating shaft 31 is provided with a limiting stopper 33. One end of the elastic structure 4 is fixed into the cavity, and the other end of the elastic structure 4 is a free end which elastically contacts with the limiting stopper 33, wherein when the refrigerator door is at either of two limiting positions, the free end of the elastic structure 4 is positioned on two sides of the limiting stopper 33, and when the refrigerator door is between the two limiting positions, the free end of the elastic structure 4 is in elastic contact with the limiting stopper 33.

[0016] The front cover plate 1 is fixed to the rear cover plate 2 via snap-fitting. In addition, a foam, a heating wire and the like are also defined in the above cavity. The mount 3 is fixed onto a container rib on a lateral side of the door.

[0017] Specifically, the elastic structure 4 is an elastic piece, the limiting stopper 33 of the mount 3 is of an arch structure, one end of the elastic structure 4 is fixed onto the front cover plate 1, and the two limiting positions are a door close position and a door open position.

[0018] As illustrated in FIG. 4 to FIG. 6, one end of the elastic piece is fixed onto the front cover plate via a screw 5, the free end is arc-shaped, an outer side of the mount is also provided with an section of arc-shaped structure, and when the door is closed, the elastic piece is in contact with one side of the limiting stopper of the mount to ensure that the turnover beam is stably in this state. When the door is being opened, the elastic piece is subjected to deformation due to extrusion, and when turnover of the turnover beam exceeds a specific angle, a resilience force of the elastic piece causes the turnover beam to continuously turn over until the door is opened. In the door open state, the elastic piece is in contact with the other side of the limiting stopper of the mount to ensure that the turnover beam is stably in this state.

[0019] In addition, the present invention further provides a refrigerator, comprising: a cabinet, the cabinet being provided with at least one compartment, the compartment being provided with side-by-side doors; and at least one group of the above-mentioned turnover beams, the turnover beams being mounted on side surfaces of the doors.

[0020] The turnover beam is in parallel with the door when the door is closed, and the turnover beam is perpendicular to the door when the door is opened.

[0021] Obviously, the above embodiment is merely an exemplary one for illustrating the present invention, but is not intended to limit the implementation of the present invention. Persons of ordinary skills in the art may derive other modifications and variations based on the above embodiment. All embodiments of the present invention are not exhaustively listed herein. Any modification, equivalent replacement, or improvement made without departing from the principle of the present invention should fall within the protection scope of the present invention.

Claims

1. A refrigerator, comprising:

   a cabinet, the cabinet being provided with at least one compartment, the compartment being provided with side-by-side doors; and
   at least one group of turnover beams mounted on side surfaces of the doors; a turnover beam comprising: a front cover plate (1), a rear cover plate (2), a mount (3), and an elastic structure (4); and in that: the front cover plate (1) and the rear cover plate (2) mate with each other to form a cavity, the mount (3) and the elastic structure (4) are being positioned in the cavity; the mount (3) comprises a fixing position (32) coupled to a refrigerator door and a rotating shaft (31) hinged to a hole (11) provided on the front cover plate (1), **characterized in that** the rotating shaft (31) is being provided with a limiting stopper (33); and one end of the elastic structure (4) is fixed into the cavity, and the other end of the elastic structure (4) is a free end which elastically contacts with the limiting stopper (33), when the refrigerator door is at either of two limiting positions, the free end of the elastic structure (4) being positioned on two sides of the limiting stopper (33), and when the refrigerator door is between the two limiting positions, the free end of the elastic structure (4) being in elastic contact with the limiting stopper (33).

2. The refrigerator according to claim 1, wherein the elastic structure (4) is an elastic piece.

3. The refrigerator according to claim 1, wherein the limiting stopper (33) of the mount (3) is of an arch structure.

4. The refrigerator according to claim 1, wherein one

end of the elastic structure (4) is fixed onto the front cover plate (1).

5. The refrigerator according to claim 1, wherein the two limiting positions are a door close position and a door open position.

6. The refrigerator according to claim 1, wherein the turnover beam is in parallel with the door when the door is closed, and the turnover beam is perpendicular to the door when the door is opened.

Patentansprüche

1. Kühlschrank, umfassend:

ein Gehäuse, wobei das Gehäuse mit zumindest einem Fach versehen ist, wobei das Fach mit nebeneinander stehenden Türen versehen ist; und
mindestens eine Gruppe von Wendebalken, die an Seitenflächen der Türen montiert sind;
wobei ein Wendebalken umfasst: eine Front-Deckplatte (1), eine Rück-Deckplatte (2), eine Halterung (3) und eine elastische Struktur (4); und dass: die Front-Deckplatte (1) und die Rück-Deckplatte (2) zueinander passen, um einen Hohlraum zu bilden, die Halterung (3) und die elastische Struktur (4) im Hohlraum angeordnet sind; die Halterung (3) eine Befestigungsposition (32), die mit einer Kühlschranktür gekoppelt ist, und eine rotierende Welle (31), die an einem Loch (11) angelenkt ist, das in der Front-Deckplatte (1) vorgesehen ist, umfasst, **dadurch gekennzeichnet, dass** die rotierende Welle (31) mit einem Begrenzungsstopper (33) versehen ist; und ein Ende der elastischen Struktur (4) im Hohlraum befestigt ist, und das andere Ende der elastischen Struktur (4) ein freies Ende ist, das mit dem Begrenzungsstopper (33) dann elastisch in Berührung kommt, wenn die Kühlschranktür sich in einer der beiden Begrenzungsstellungen befindet, wobei das freie Ende der elastischen Struktur (4) auf zwei Seiten des Begrenzungsstoppers (33) angeordnet ist, und, wenn die Kühlschranktür sich zwischen den beiden Begrenzungsstellungen befindet, das freie Ende der elastischen Struktur (4) den Begrenzungsstopper (33) elastisch berührt.

2. Kühlschrank nach Anspruch 1, worin die elastische Struktur (4) ein elastisches Stück ist.

3. Kühlschrank nach Anspruch 1, worin der Begrenzungsstopper (33) der Halterung (3) eine Bogenstruktur hat.

4. Kühlschrank nach Anspruch 1, worin ein Ende der elastischen Struktur (4) an der Front-Deckplatte (1) befestigt ist.

5. Kühlschrank nach Anspruch 1, worin die beiden Begrenzungsstellungen eine Türschließstellung und eine Türöffnungsstellung sind.

6. Kühlschrank nach Anspruch 1, worin der Wendebalken zur Tür parallel ist, wenn die Tür geschlossen ist, und der Wendebalken zur Tür senkrecht ist, wenn die Tür geöffnet ist.

Revendications

1. Réfrigérateur, comprenant :

une armoire, l'armoire étant pourvue d'au moins un compartiment, le compartiment étant pourvu de portes côte-à-côte ; et
au moins un groupe de poutres articulées montées sur les surfaces latérales des portes ;
une poutre articulée comprenant : une plaque (1) de capot avant, une plaque (2) de capot arrière, un siège (3) de montage et une structure élastique (4) ; et en ce que : la plaque de capot avant (1) et la plaque de capot arrière (2) sont accouplées par correspondance l'une à l'autre pour former une cavité ; le siège (3) de montage et la structure élastique (4) sont agencés dans la cavité ; le siège (3) de montage comprend une position (32) de fixation raccordée à une porte de réfrigérateur et un arbre (31) rotatif articulé avec un orifice (11) formé dans la plaque (1) de capot avant, **caractérisé en ce que** l'arbre rotatif (31) est doté d'une butée (33) de limitation ; et une extrémité de la structure élastique (4) est fixée dans la cavité et l'autre extrémité de la structure élastique est une extrémité libre venant en contact élastique avec la butée (33) de limitation, lorsque la porte de réfrigérateur est dans l'une de deux positions de limitation, l'extrémité libre de la structure élastique (4) est placée sur deux côtés de la butée (33) de limitation ; et lorsque la porte de réfrigérateur se trouve entre les deux positions de limitation, l'extrémité libre de la structure élastique (4) est en contact élastique avec la butée (33) de limitation.

2. Réfrigérateur selon la revendication 1, dans lequel la structure élastique (4) est une pièce élastique.

3. Réfrigérateur selon la revendication 1, dans lequel la butée de limitation (33) du siège (3) de montage est une structure en arc.

4. Réfrigérateur selon la revendication 1, dans lequel une extrémité de la structure élastique (4) est fixé sur la plaque de capot avant (1).

5. Réfrigérateur selon la revendication 1, dans lequel les deux positions de limitation sont une position de porte ouverte et une position de porte fermée.

6. Réfrigérateur selon la revendication 1, dans lequel la poutre articulée est parallèle à la porte lorsque la porte est fermée, et la poutre articulée est perpendiculaire à la porte lorsque la porte est ouverte.

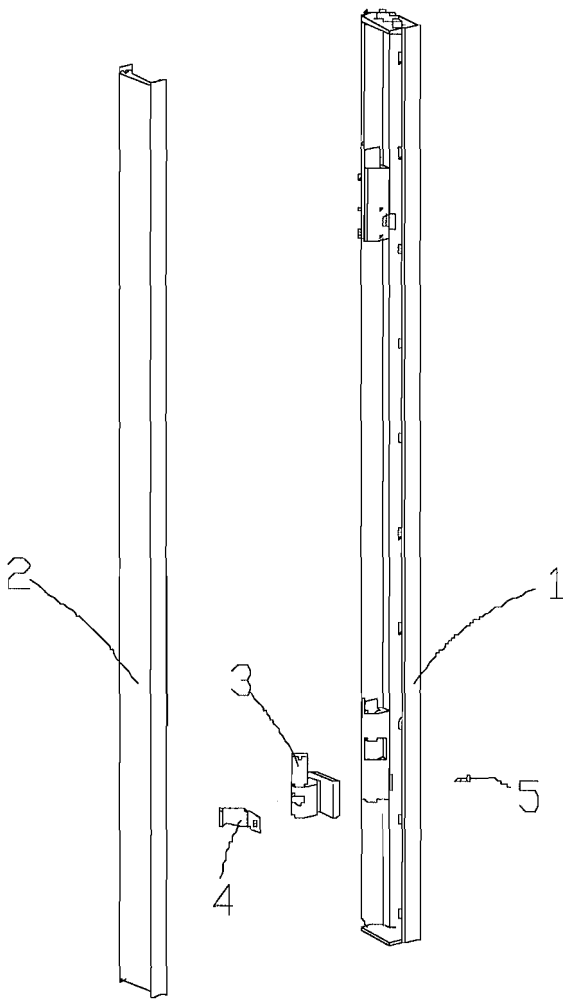

FIG. 1

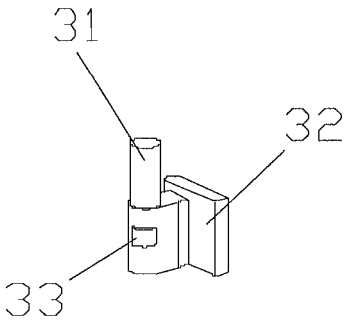

FIG. 2

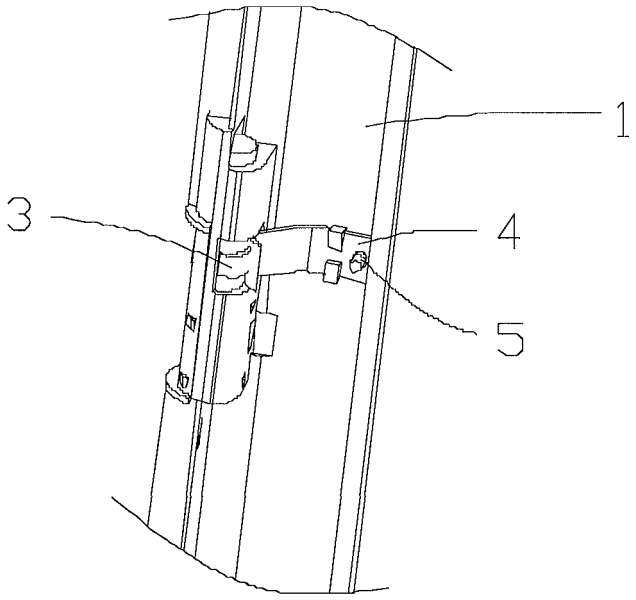

FIG. 3

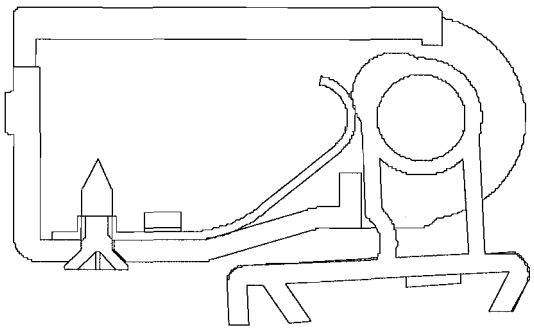

FIG. 4

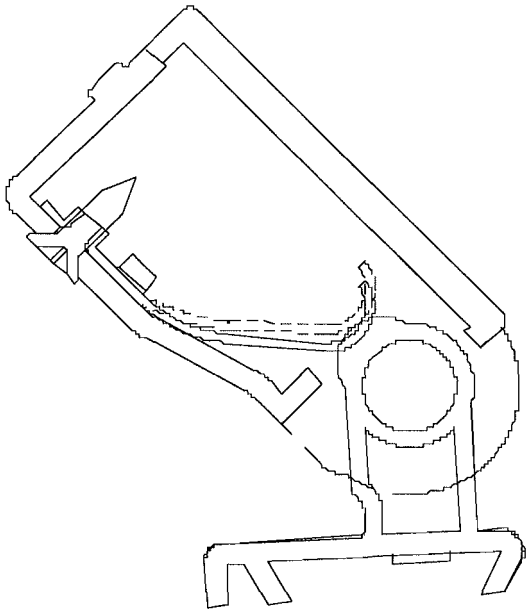

FIG. 5

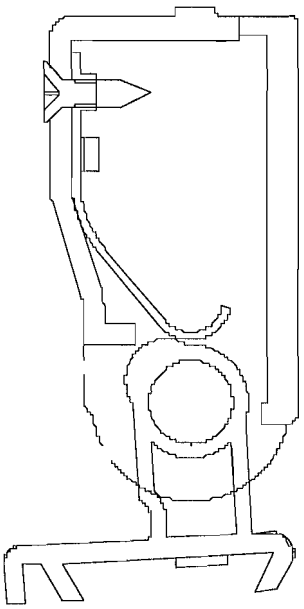

FIG. 6

REFERENCES CITED IN THE DESCRIPTION

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