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(54) **LEVER ASSISTED HANDLE, AND REFRIGERATOR THEREWITH**

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POIGNÉE ASSISTÉE PAR LEVIER, ET RÉFRIGÉRATEUR ÉQUIPÉ DE CELLE-CI

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(56) References cited:

EP-A1- 2 110 628	EP-A2- 1 426 537
CN-A- 101 871 716	CN-A- 102 383 648
CN-A- 106 369 920	CN-A- 109 403 717
CN-U- 206 144 272	CN-U- 207 277 989
CN-U- 208 380 376	CN-U- 208 382 693
DE-A1- 102015 222 738	JP-A- 2006 250 481
KR-B1- 100 880 402	US-A1- 2017 051 542

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Description

TECHNICAL FIELD

[0001] The present invention relates to the technical field of household refrigeration electrical appliance, and specifically to a handle for a refrigerator and a refrigerator having the handle.

BACKGROUND

[0002] In modern life, refrigerators are applied more and more widely, and almost become requisite household electrical appliance. The refrigerator is such an apparatus that it stores various food in a refrigerated state or a frozen state for a period of time in a preserved manner.

[0003] As technologies develop, functions of refrigerators become richer and richer, and the volume of refrigerators becomes bigger and bigger, so that doors of refrigerators become bigger. Meanwhile, due to the negative pressure in the refrigerator and a magnetic force between door seals of the door, a large force usually needs to be applied on the handle on the door of the refrigerator to directly open the door, which causes the difficulty in opening the door.

[0004] D1 (EP2110628A1) disclosed an opening device having a fastening plate for assembly to the door, a push member, and a handle for moving the push member at least between a closed position and an open position closing and opening the door respectively; the handle being hingeable selectively to the fastening plate about two separate hinge axes.

[0005] D2 (DE102015222738A1) disclosed a handle unit which is designed to be pivoted relative to the appliance closure element about a handle pivot axis arranged at least substantially perpendicular to a longitudinal extension direction of the handle unit at least in order to trigger the opening aid unit.

[0006] D3 (EP1426537A2) disclosed an opening device, which is fitted to the door, and has a handle hinged about a first axis, a pusher connected to the handle and for detaching the door from the main body, and a member for emitting an acoustic signal; the acoustic signal being emitted by operation of the opening device.

SUMMARY

[0007] An object of the present invention is to provide an assist handle and a refrigerator having the same. The assist handle employs a lever structure, the user may open the door of the refrigerator by pulling the handle bar with a small amplitude, and the lever structure may achieve an effect of opening the door of the refrigerator in a force-saving manner.

[0008] The present invention provides an assist handle as presented in claim 1.

[0009] As optional embodiments of the present inven-

tion, the assist handle is conform to any of the claims 2 to 7.

[0010] The present invention further provides a refrigerator as presented in claim 8.

5 [0011] As compared with the prior art, the present invention provides the assist handle and a refrigerator; the assist structure of the assist handle employs a plurality of levers and links which are pivoted to one another; the assist structure, on the one hand, lengthens a moment arm acting on the push rod and achieves the force-saving effect; on the other hand, in the case that the handle bar is long, the distance by which the user pulls the handle bar is made small, and the phenomenon that the user needs to pull the handle bar with a large force is avoided. 10 In addition, the structure that the handle bar is set as a plurality of interlinked handle portions helps achieve a better force-saving effect. 15

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

FIG. 1 is a cross-sectional view of a refrigerator having an assist handle in an embodiment of the present invention.

FIG. 2 is an enlarged schematic view of a region A in FIG. 1.

FIG. 3 is a cross-sectional view of a refrigerator having an assist handle in another embodiment of the present invention.

FIG. 4 is an enlarged schematic view of a region B in FIG. 3.

DETAILED DESCRIPTION

35 [0013] The present invention will be described in detail in conjunction with embodiments shown in the figures. However, these embodiments are not intended to limit the present invention. Structural, methodological or functional variations made by those having ordinary skill in the art according to these embodiments are all included in the extent of protection of the present invention.

[0014] FIG. 1 is a cross-sectional view of a refrigerator having an assist handle in an embodiment of the present invention. FIG. 2 is an enlarged schematic view of a region A in FIG. 1.

[0015] As shown in FIG. 1 and FIG. 2, a refrigerator 100 comprises a door 101 and a cabinet 102. The door 101 is pivoted to the cabinet 102 and may be opened or closed relative to the cabinet 102. The cabinet 102 comprises a plurality of compartments for storing items.

[0016] A front side of the door 101 is provided with a handle bar 10, an assist structure is disposed at a top end of the handle bar 10, the assist structure is located between the front side of the door 101 and the top end of the handle bar 10, and the top end of the handle bar 10 is close to the top of the refrigerator 100. The assist handle comprises a first lever 11, a first rotation shaft 20, 45 50 55

a link 12, a second lever 13 and a second rotation shaft 21, wherein the first lever 11 is disposed at the top end of the handle bar 10, and preferably, the first lever 11 is integrally formed with the handle bar 10; an upper end of the first lever 11 is pivoted to the first rotation shaft 20; the second lever 13 is arranged opposite to the first lever 11, and the second lever 13 is pivoted to the second rotation shaft 21; wherein, both ends of the link 12 are pivoted to a lower end of the first lever 11 and a lower end of the second lever 13 respectively.

[0017] When the user pulls the handle bar 10 outwards, the handle bar 10 and the first lever 11 pivot together around the first rotation shaft 20. At this time, the handle bar 10 is lifted relative to the door 101, the first lever 11 drives the link 12 to move linearly, and the link 12 drives the second lever 13 to pivot around the second rotation shaft 21 so that the upper end of the second lever 13 pushes against a front end of a push rod 50 of the assist handle to enable the push rod 50 to move along a guide groove 60, and a distal end of the push rod 50 pushes against the cabinet 102, thereby opening the door 101 relative to the cabinet 102. The guide groove 60 runs through the door 101, and the push rod 50 is inserted in the guide groove 60.

[0018] When the user pulls the handle bar 10 outwards, the first lever 11, the link 12 and the second lever 13 pivoted to one another, on the one hand, extend the force arm acting on the push rod 50, and achieve a force-saving effect; on the other hand, in the case that the handle bar 10 is long (for example, the handle bar on the door of a side-by-side refrigerator), the pivotal design of the first lever 11, the link 12 and the second lever 13 allows the user to pull the handle bar by a smaller distance and avoid a phenomenon that the user needs to pull the handle bar with a large force; that is, the assist handle of the present invention is adapted for a refrigerator with a large door 101, such as a side-by-side refrigerator.

[0019] In the present invention, a side of the door 101 close to the user is defined as "a front side", and the other side away from the user is defined as "a rear side"; ends of the first lever 11 and the second lever 13 close to the top of the refrigerator 100 are defined "upper ends", and ends close to a ground plane where the refrigerator 100 is placed are defined as "lower ends"; an end of the push rod 50 close to the user is defined as a front end, and the end far away from the user is defined as a distal end.

[0020] Further referring to FIG. 1 and FIG. 2, the assist handle further comprises a base 30 which is configured as a box with an open end, and the open end of the box is engaged with the front side of the door 101. The base 30 has an upper side wall, the upper side wall is perpendicular to the door 101, the first rotation shaft 20 is disposed on a lower surface of the upper side wall, and the lower surface faces the bottom of the refrigerator 100; the second rotation shaft 21 is disposed on a surface of the front side of the door 101; the first rotation shaft 20, the second rotation shaft 21, the first lever 11, the second lever 13 and the link 12 are respectively received in an

internal space of the base 30.

[0021] In the present embodiment, the link 12 is parallel and close to the lower side wall of the base 30, and the lower side wall is opposite to the upper side wall. The first lever 11 and the second lever 13 are respectively vertically pivoted to both ends of the link 12, so that the first lever 11, the link 12 and the second lever 13 form a U shape accommodated in the internal space of the base 30. Both ends of the link 12 are each provided with a first pivot structure, the lower end of the first lever 11 and the lower end of the second lever 12 are respectively provided with a second pivot structure, the first pivot structure is for example one of a pivot hole and a pivot shaft, the second pivot structure is for example the other of the pivot hole and the pivot shaft.

[0022] In addition, the lower side wall of the base 30 is provided with an escape hole corresponding to the handle bar 10, and the handle bar 10 extends out of the escape hole and is located outside the base 30, wherein the lower side wall is opposite to the upper side wall.

[0023] Furthermore, the push rod 50 comprises a first rod body 51 and a second rod body 52. The first rod body 51 and the second rod body 52 are connected to each other by an elastic member 40. The elastic member 40 is for example a spring. The first rod body 51 is provided with a first post, the second rod body 52 is provided with a second post, and the first post is opposite to the second post. Both ends of the spring are respectively sleeved on the first post and the second post, wherein the upper end of the second lever 13 abuts against a proximal end of the first rod body 51. Preferably, the second lever 13 has a protrusion which abuts against the proximal end of the first rod body 51. In other embodiments of the present invention, the elastic member may further be a metal elastic piece, elastic silicone, etc.

[0024] In addition, the push rod 50 is inserted in the guide groove 60, and the proximal end of the first rod body 51 extends out of the guide groove 60 and protrudes from the surface of the front side of the door 101, thereby facilitating the protrusion at the upper end of the second lever 13 to push against the first rod body 51.

[0025] In the present embodiment, the elastic member 40 provides an elastic force to return the handle bar 10. Specifically, the handle bar 10 is pulled to raise the handle bar 10 relative to the door 101. The handle bar 10 drives the first lever 11 to rotate counterclockwise around the first rotation shaft 20, the first lever 11 drives the link 12 to move forward horizontally and linearly, the link 12 drives the second lever 12 to rotate counterclockwise around the second rotation shaft 21 so that the protrusion at the upper end of the second rotation shaft 21 pushes against the first rod body 51, the first rod body 51 compresses the elastic member 40, the elastic member 40 pushes against the second rod body 52, and the distal end of the second rod body 52 pushes against the cabinet 102 so that the door 101 is opened; after the door 101 is opened, the distal end of the second rod body 52 abuts against the cabinet 102, the force acting upon the handle

bar 10 is removed, the elastic member 40 is no longer compressed by the first rod body 51 and returns from a compressed state to an extended state to provide an elastic force, the elastic force acts on the first rod body 51, the first rod body 51 pushes the second lever 13 so that the second lever 13 rotates clockwise around the second rotation shaft 21, the second lever 13 drives the link 12 to move horizontally and linearly backward, and the link 12 drives the first lever 11 to rotate clockwise around the first rotation shaft 20, whereupon the handle bar 10 returns along with the rotation of the first lever 11.

[0026] FIG. 3 is a cross-sectional view of a refrigerator having an assist handle in another embodiment of the present invention; FIG. 4 is an enlarged schematic view of a region B in FIG. 3. The same reference numerals in FIG. 3 and FIG. 4 as those in FIG. 1 and FIG. 2 represent similar elements having similar functions, which will not be detailed any more.

[0027] As shown in FIG. 3 and FIG. 4, another embodiment of the present invention provides a refrigerator 200, which is different from the refrigerator 100 in that the handle bar 10' of the refrigerator 200 is a longer rod body comprising a first handle portion 103 and a second handle portion 104, and a bottom end of the first handle portion 103 and a top end of the second handle portion 104 are connected by a connecting structure. The connecting structure comprises a first connector 1, a second connector 2, a fixed seat 3, a sliding groove 4, a lifting rod 5 and a lifting shaft 6, wherein the fixed seat 3 is disposed between the handle bar 10' and the door 101, and the sliding groove 4 is provided in the interior of the fixed seat 3. In the present embodiment, the sliding groove 4 is a through hole running through front and rear sides of the fixed seat 3. The lifting rod 5 is received in the sliding groove 4, a proximal end of the lifting rod 5 is provided the lifting shaft 6, the lifting hole at the distal end of the first connector 1 and the lifting hole at the distal end of the second connector 2 are respectively pivoted to the lifting shaft 6, and the first connector 1 and the second connector 2 pivoted on the on the lifting shaft 6 are arranged in a V shape. In other embodiments of the present invention, another lifting hole is provided at the proximal end of the lifting rod, and the mutual pivoting of the first connector, the second connector and the lifting rod is achieved by running another independent lifting shaft through the lifting hole at distal end of the first connector, the lifting hole at the distal end of the second connector and the lifting hole at the proximal end of the lifting rod.

[0028] In addition, the proximal end of the first connector 1 is connected to the bottom end of the first handle portion 103, and the proximal end of the second connector 2 is connected to the top end of the second handle portion 104.

[0029] In the refrigerator 200, when the user pulls one of the first handle 103 and the second handle 104, the first handle portion 103 and the second handle portion 104 are simultaneously pulled. That is, when the user pulls the first handle portion 103, the first handle portion

103 is lifted toward the front side of the door 101, and the first connector 1 at the bottom end of the first handle portion 103 is driven to lift toward the front side of the door 101, the first connector 1 drives the lifting rod 5 to move along the sliding groove 4 toward the proximal end of the sliding groove 4, and at the same time, the second connector 2 at the top end of the second handle portion 104 is lifted toward the front side of the door 101, and thereby the second handle portion 104 is driven to lift toward the front side of the door 101 to realize the linkage of the first handle portion 103 and the second handle portion 104. When the lifting rod 5 moves along the sliding groove 4 toward the proximal end of the sliding groove 4, an angle between the first connector 1 and the second connector 2 becomes larger.

[0030] The above connecting structure connects the first handle portion 103 with the second handle portion 104, so that the first handle portion 103 and the second handle portion 104 are linked with each other. The user only needs to pull one of the first handle portion 103 and the second handle portion 104 with a small force so that the other of the first handle portion 103 and the second handle portion 104 is pulled together simultaneously. The connecting structure is particularly suitable for a side-by-side refrigerator with a long handle bar.

[0031] In the present embodiment, a longitudinal section of the lifting rod 5 is a T-shaped structure, the structure of the sliding groove 4 is adapted to the structure of the lifting rod 5, and the lifting shaft 6 is provided at a proximal end of the T-shaped structure, and a width of the proximal end of the T-shaped structure is greater than the width of its distal end.

[0032] Further referring to FIG. 3 and FIG. 4, the refrigerator 200 employs an assist structure similar to that in the refrigerator 100. Reference may be made to the depictions of the refrigerator 100 for the assist structure. The difference lies in that the refrigerator 200 uses a pair of assist structures, namely, two assist structures. The pair of assist structures are respectively distributed at opposed top and bottom ends of the handle bar 10', that is, one assist structure is provided at the top end of the first handle portion 103, close to the top of the refrigerator 200; the other assist structure is disposed at the bottom end of the second handle portion 104, close to the ground plane where the refrigerator 200 is placed.

[0033] It should be noted that the longer handle bar 10' in the refrigerator 200 is provided as the first handle portion 103 and the second handle portion 104 that may be linked with each other, the pair of assist structures are employed, and the pair of assist structures are provided at the top end of the first handle portion 103 and the bottom end of the second handle portion 104, respectively. The user can open the door 101 of the refrigerator 200 by only applying a force that can lift one handle portion of the handle bar 10'. Hence, the assist structure and the interlinked first handle portion 103 and second handle portion 104 may jointly achieve a better force-saving effect.

[0034] In addition, in the refrigerator 200, the handle bar 10' is divided into two handle portions (the first handle portion 103 and the second handle portion 104), but the handle bar is not limited to this. In other embodiments of the present invention, the longer handle bar may be divided into a plurality of handle portions according to actual needs, and the plurality of handle portions are connected to one another through the above connecting structure, so that the plurality of handle portions are connected with one another by the above connecting structure so as to interlink with one another.

[0035] In summary, the present invention provides the assist handle and a refrigerator; the assist structure of the assist handle employs a plurality of levers and links which are pivoted to one another; the assist structure, on the one hand, lengthens a moment arm acting on the push rod and achieves the force-saving effect; on the other hand, in the case that the handle bar is long, the distance by which the user pulls the handle bar is small, and the phenomenon that the user needs to pull the handle bar with a large force is avoided. In addition, the structure that the handle bar is set as a plurality of interlinked handle portions helps achieve a better force-saving effect.

[0036] The detailed descriptions set forth above are merely specific illustrations of feasible embodiments of the present invention, and are not intended to limit the scope of protection of the present invention.

Claims

1. An assist handle disposed on a front side of a door (101) of a refrigerator (100), wherein the assist handle comprises:

a handle bar (10,10') disposed on the front side of the door (101); and
an assist structure disposed between the handle bar (10,10') and the door (101), the assist structure comprises:

a first lever (11), a lower end of the first lever (11) is connected to a top end of the handle bar (10,10');

a first rotation shaft (20) pivoted to the first lever (11);

a second lever (13) opposed to the first lever (11);

a second rotation shaft (21) pivoted to the second lever (13); and

a link (12) disposed between the first lever (11) and the second lever (13), both ends of the link (12) being pivoted to the first lever (11) and the second lever (12), respectively; wherein the handle bar (10,10') is pulled, and the handle bar (10,10') drives the first lever (11) to rotate about the first rotation

shaft (20); the first lever (11) drives the link (12) to move linearly; the link (12) drives the second lever (13) to rotate about the second rotation shaft (21);

characterized in that the assist handle further comprises a connecting structure, the handle bar (10,10') comprises a first handle portion (103) and a second handle portion (104), and the connecting structure is connected with a bottom end of the first handle portion (103) and a top end of the second handle portion (104);

wherein the connecting structure comprises a first connector (1) and a second connector (2), a proximal end of the first connector (1) is connected with the bottom end of the first handle portion (103), a proximal end of the second connector (2) is connected with the top end of the second handle portion (104), wherein a distal end of the first connector (1) and a distal end of the second connector (2) overlap so that the first connector (1) and the second connector (2) form a V-shaped structure.

2. The assist handle according to claim 1, wherein the assist handle further comprising a base (30), the base (30) has an upper side wall, the upper side wall is perpendicular to the door (101), the first rotation shaft (20) is disposed on a lower surface of the upper side wall, and the lower surface faces the bottom of the refrigerator (100).
3. The assist handle according to claim 2, wherein the second rotation shaft (21) is disposed on a surface of the front side of the door (101).
4. The assist handle according to claim 1, wherein the assist handle further comprising a push rod (50) and a guide groove (60), the push rod (50) is disposed in the guide groove (60), and the guide groove (60) runs through the door (101); wherein an upper end of the second lever (13) abuts against a proximal end of the push rod (50).
5. The assist handle according to claim 4, wherein the assist handle further comprising an elastic member (40), the push rod (50) comprises a first rod body (51) and a second rod body (52), the elastic member (40) is disposed between the first rod body (51) and the second rod body (52), and both ends of the elastic member (40) are connected to the first rod body (51) and the second rod body (52), respectively.
6. The assist handle according to claim 1, wherein the assist handle further comprising a fixed seat (3), a sliding groove (4), a lifting rod (5) and a lifting shaft (6), the fixed seat (3) is disposed between the door

(101) and the handle bar (10'), the sliding groove (4) is provided in the interior of the fixed seat (3), the lifting rod (5) is inserted in the sliding groove (4), the lifting shaft (6) is disposed at a proximal end of the lifting rod (5), and the lifting shaft (6) is pivoted to the distal end of the first connector (1) and the distal end of the second connector (2).

7. The assist handle according to claim 1, wherein the number of the assist structures is two, one of the assist structures is disposed between the top end of the first handle portion (103) and the door (101), and the other of the assist structures is disposed between the bottom end of the second handle portion (104) and the door (101).
8. A refrigerator (100) comprising a door (101) and a cabinet (102), wherein the door (101) is provided with an assist handle which is the assist handle according to any of claims 1-7.

Patentansprüche

1. Hilfsgriff, der auf einer Vorderseite einer Tür (101) eines Kühlschranks (100) angeordnet ist, mit:

einer Griffstange (10, 10'), die auf der Vorderseite einer Tür (101) angeordnet ist; und
einer Hilfsstruktur, die zwischen der Griffstange (10, 10') und der Tür (101) angeordnet ist, wobei die Hilfsstruktur

einen ersten Hebel (11), dessen unteres Ende mit einem oberen Ende der Griffstange (10, 10') verbunden ist;
eine erste Drehwelle (20), die an dem ersten Hebel (11) schwenkbar angelenkt ist;
einen zweiten Hebel (13), der dem ersten Hebel (11) gegenüberliegt;
eine zweite Drehwelle (21), die an dem zweiten Hebel (13) schwenkbar angelenkt ist; und
ein Verbindungsglied (12) aufweist, das zwischen dem ersten Hebel (11) und dem zweiten Hebel (13) angeordnet ist, wobei beide Enden des Verbindungsglieds (12) jeweils an dem ersten Hebel (11) und dem zweiten Hebel (13) schwenkbar angelenkt sind;

wobei die Griffstange (10, 10') gezogen wird, und die Griffstange (10, 10') den ersten Hebel (11) zur Drehung um die erste Drehwelle (20) antreibt; der erste Hebel (11) das Verbindungsglied (12) zu einer linearen Bewegung antreibt; und das Verbindungsglied (12) den zweiten Hebel (13) zur Drehung um die zweite Drehwelle

(21) antreibt;

dadurch gekennzeichnet, dass der Hilfsgriff ferner eine Verbindungsstruktur aufweist, die die Griffstange (10, 10') einen ersten Griffabschnitt (103) und einen zweiten Griffabschnitt (104) aufweist, und die Verbindungsstruktur mit einem unteren Ende des ersten Griffabschnitts (103) und einem oberen Ende des zweiten Griffabschnitts (104) verbunden ist; wobei die Verbindungsstruktur einen ersten Verbinder (1) und einen zweiten Verbinder (2) aufweist, ein proximales Ende des ersten Verbinders (1) mit dem unteren Ende des ersten Griffabschnitts (103) verbunden ist, ein proximales Ende des zweiten Verbinders (2) mit dem oberen Ende des zweiten Griffabschnitts (104) verbunden ist, wobei ein distales Ende des ersten Verbinders (1) und ein distales Ende des zweiten Verbinders (2) überlappen, so dass der erste Verbinder (1) und der zweite Verbinder (2) eine V-förmige Struktur bilden.

2. Hilfsgriff nach Anspruch 1, wobei der Hilfsgriff ferner eine Basis (30) aufweist, die Basis (30) eine obere Seitenwand hat, die obere Seitenwand senkrecht zur Tür (101) ist, die erste Drehwelle (20) an einer unteren Fläche der oberen Seitenwand angeordnet ist und die untere Fläche dem Boden des Kühlschranks (100) zugewandt ist.
3. Hilfsgriff nach Anspruch 2, wobei die zweite Drehwelle (21) an einer Fläche der Vorderseite der Tür (101) angeordnet ist.
4. Hilfsgriff nach Anspruch 1, wobei der Hilfsgriff ferner eine Schubstange (50) und eine Führungsnut (60) aufweist, die Schubstange (50) in der Führungsnut (60) angeordnet ist und die Führungsnut (60) durch die Tür (101) verläuft; wobei ein oberes Ende des zweiten Hebels an einem proximalen Ende der Schubstange (50) anliegt.
5. Hilfsgriff nach Anspruch 4, wobei der Hilfsgriff ferner ein elastisches Element (40) aufweist, die Schubstange (50) einen ersten Stangenkörper (51) und einen zweiten Stangenkörper (52) aufweist, das elastische Element (40) zwischen dem ersten Stangenkörper (51) und dem zweiten Stangenkörper (52) angeordnet ist und beide Enden des elastischen Elements (40) jeweils mit dem ersten Stangenkörper (51) und dem zweiten Stangenkörper (52) verbunden sind.
6. Hilfsgriff nach Anspruch 1, wobei der Hilfsgriff ferner einen festen Sitz (3), eine Gleitnut (4), eine Hebestange (5) und eine Hebewelle (6) aufweist, der feste Sitz (3) zwischen der Tür (101) und der Griffstange (10') angeordnet ist, die Gleitnut (4) im Inneren des

festen Sitzes (3) vorgesehen ist, die Hebestange (5) in die Gleitnut (4) eingesetzt ist, die Hebewelle (6) am proximalen Ende der Hebestange (5) angeordnet ist und die Hebewelle (6) an dem distalen Ende des ersten Verbinders (1) und dem distalen Ende des zweiten Verbinders (2) schwenkbar angelenkt ist.

7. Hilfsgriff nach Anspruch 1, wobei die Anzahl der Hilfsstrukturen zwei beträgt, eine der Hilfsstrukturen zwischen dem oberen Ende des ersten Griffabschnitts (103) und der Tür (101) angeordnet ist und die andere der Hilfsstrukturen zwischen dem unteren Ende des zweiten Griffabschnitts (104) und der Tür (101) angeordnet ist.
8. Kühlschrank (100) mit einer Tür (101) und einem Gehäuse (102), wobei die Tür (101) mit einem Hilfsgriff vorgesehen ist, der der Hilfsgriff nach einem der Ansprüche 1 bis 7 ist.

Revendications

1. Poignée d'assistance disposée sur un côté avant d'une porte (101) d'un réfrigérateur (100), dans laquelle la poignée d'assistance comprend :

une barre de poignée (10, 10') disposée sur le côté avant de la porte (101) ; et

une structure d'assistance disposée entre la barre de poignée (10, 10') et la porte (101), la structure d'assistance comprend :

un premier levier (11), une extrémité inférieure du premier levier (11) est reliée à une extrémité supérieure de la barre de poignée (10, 10') ;
un premier arbre de rotation (20) pivotant sur le premier levier (11) ;
un second levier (13) opposé au premier levier (11) ;
un second arbre de rotation (21) pivotant sur le second levier (13) ; et
une liaison (12) disposée entre le premier levier (11) et le second levier (13), les deux extrémités de la liaison (12) pivotant sur le premier levier (11) et le second levier (12), respectivement ;
dans laquelle la barre de poignée (10, 10') est tirée et la barre de poignée (10, 10') entraîne le premier levier (11) à tourner autour du premier arbre de rotation (20) ; le premier levier (11) entraîne la liaison (12) à se déplacer linéairement ; la liaison (12) entraîne le second levier (13) à tourner autour du second arbre de rotation (21) ;
caractérisée en ce que la poignée d'assis-

tance comprend en outre une structure de connexion, la barre de poignée (10, 10') comprend une première partie de poignée (103) et une seconde partie de poignée (104) et la structure de connexion est reliée à une extrémité inférieure de la première partie de poignée (103) et à une extrémité supérieure de la seconde partie de poignée (104) ;
dans laquelle la structure de connexion comprend un premier connecteur (1) et un second connecteur (2), une extrémité proximale du premier connecteur (1) est reliée à l'extrémité inférieure de la première partie de poignée (103), une extrémité proximale du second connecteur (2) est reliée à l'extrémité supérieure de la seconde partie de poignée (104), dans laquelle une extrémité distale du premier connecteur (1) et une extrémité distale du second connecteur (2) se chevauchent de telle sorte que le premier connecteur (1) et le second connecteur (2) forment une structure en forme de V.

2. Poignée d'assistance selon la revendication 1, dans laquelle la poignée d'assistance comprend en outre une base (30), la base (30) présente une paroi latérale supérieure, la paroi latérale supérieure est perpendiculaire à la porte (101), le premier arbre de rotation (20) est disposé sur une surface inférieure de la paroi latérale supérieure et la surface inférieure fait face au fond du réfrigérateur (100).
3. Poignée d'assistance selon la revendication 2, dans laquelle le second arbre de rotation (21) est disposé sur une surface du côté avant de la porte (101).
4. Poignée d'assistance selon la revendication 1, dans laquelle la poignée d'assistance comprend en outre une tige de poussée (50) et une rainure de guidage (60), la tige de poussée (50) est disposée dans la rainure de guidage (60) et la rainure de guidage (60) traverse la porte (101) ; dans laquelle une extrémité supérieure du second levier (13) vient en butée contre une extrémité proximale de la tige de poussée (50).
5. Poignée d'assistance selon la revendication 4, dans laquelle la poignée d'assistance comprend en outre un élément élastique (40), la tige de poussée (50) comprend un premier corps de tige (51) et un second corps de tige (52), l'élément élastique (40) est disposé entre le premier corps de tige (51) et le second corps de tige (52) et les deux extrémités de l'élément élastique (40) sont reliées respectivement au premier corps de tige (51) et au second corps de tige (52).

6. Poignée d'assistance selon la revendication 1, dans laquelle la poignée d'assistance comprend en outre un siège fixe (3), une rainure de coulissement (4), une tige de levage (5) et un arbre de levage (6), le siège fixe (3) est disposé entre la porte (101) et la barre de poignée (10'), la rainure de coulissement (4) est ménagée à l'intérieur du siège fixe (3), la tige de levage (5) est insérée dans la rainure de coulissement (4), l'arbre de levage (6) est disposé à une extrémité proximale de la tige de levage (5) et l'arbre de levage (6) est pivotant sur l'extrémité distale du premier connecteur (1) et l'extrémité distale du second connecteur (2).
7. Poignée d'assistance selon la revendication 1, dans laquelle le nombre de structures d'assistance est deux, l'une des structures d'assistance est disposée entre l'extrémité supérieure de la première partie de poignée (103) et la porte (101) et l'autre des structures d'assistance est disposée entre l'extrémité inférieure de la seconde partie de poignée (104) et la porte (101).
8. Réfrigérateur (100) comprenant une porte (101) et une armoire (102), dans lequel la porte (101) est pourvue d'une poignée d'assistance qui est la poignée d'assistance selon l'une quelconque des revendications 1-7.

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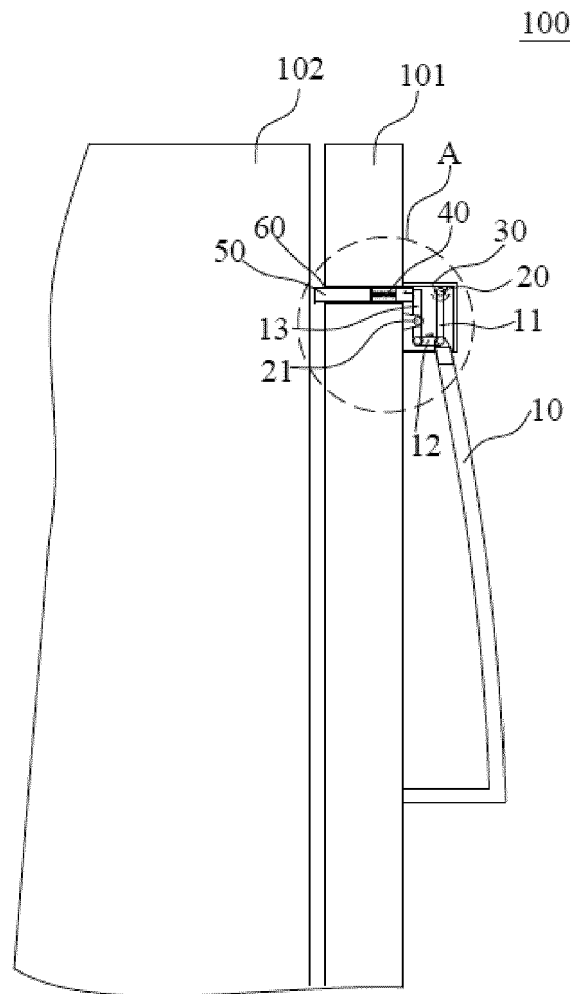


FIG. 1

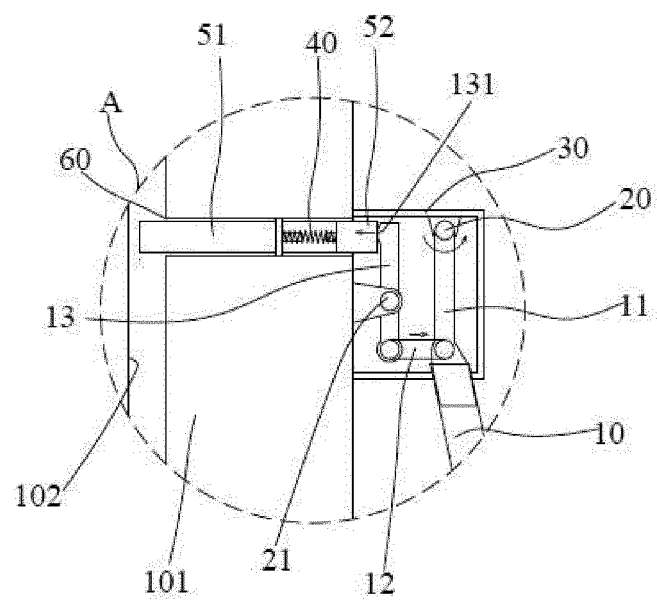


FIG. 2

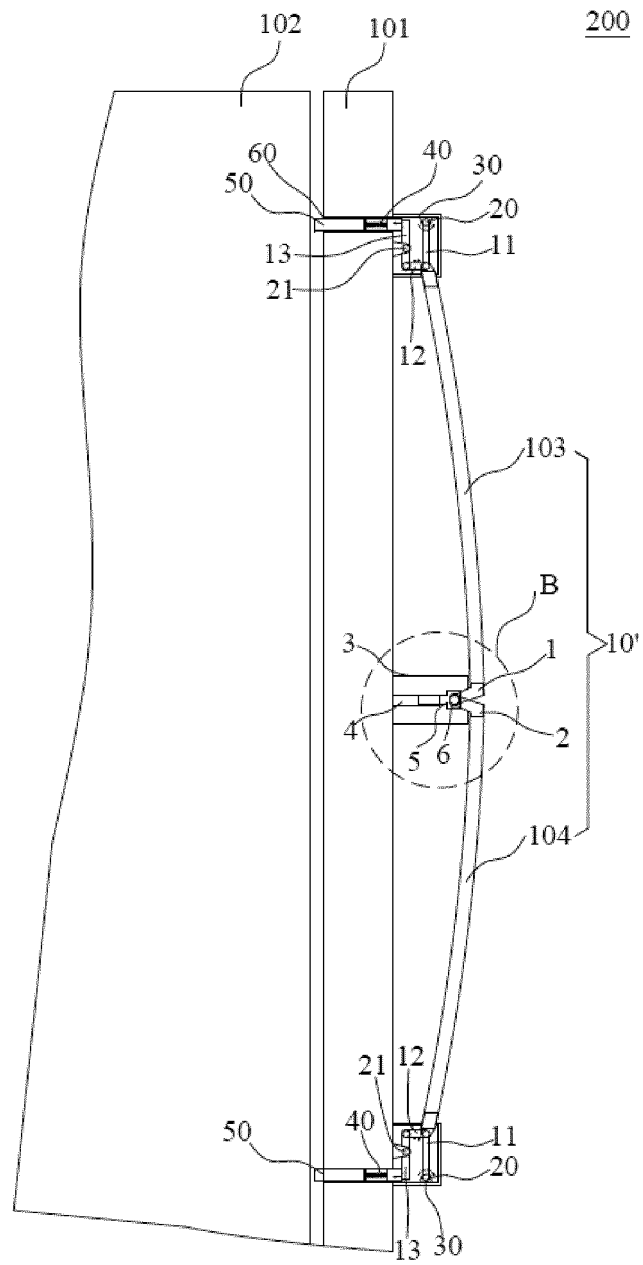


FIG. 3

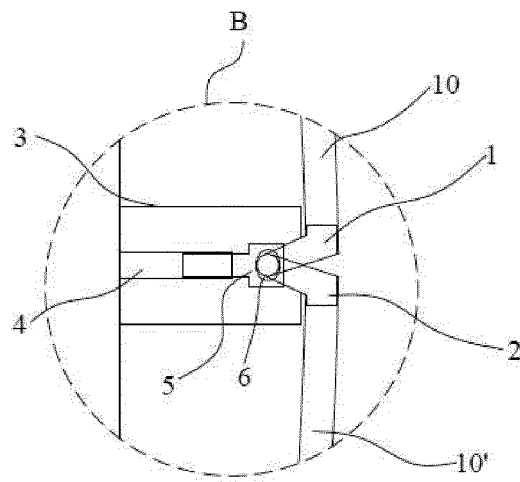


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 2110628 A1 [0004]
- DE 102015222738 A1 [0005]
- EP 1426537 A2 [0006]