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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.

SUMMARY

[0004] 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.

[0005] The present invention provides an assist handle disposed on a front side of a door of the refrigerator, the assist handle comprising: a handle bar disposed on the front side of the door; and an assist structure disposed between the handle bar and the door, the assist structure comprises a first lever, a lower end of the first lever is connected to a top end of the handle bar; a first rotation shaft pivoted to the first lever; a second lever opposed to the first lever; a second rotation shaft pivoted to the second lever; and a link disposed between the first lever and the second lever, both ends of the link being pivoted to the first lever and the second lever, respectively; wherein the handle bar is pulled, and the handle bar drives the first lever to rotate about the first rotation shaft; the first lever drives the link to move linearly; the link drives the second lever to rotate about the second rotation shaft.

[0006] As an optional embodiment of the present invention, the assist handle further comprising a base, the base has an upper side wall, the upper side wall is perpendicular to the door, the first rotation shaft is disposed on a lower surface of the upper side wall, and the lower

surface faces the bottom of the refrigerator.

[0007] As an optional embodiment of the present invention, the second rotation shaft is disposed on a surface of the front side of the door.

5 [0008] As an optional embodiment of the present invention, the assist handle further comprising a push rod and a guide groove, the push rod is disposed in the guide groove, and the guide groove runs through the door; wherein an upper end of the second level abuts against a proximal end of the push rod.

10 [0009] As an optional embodiment of the present invention, the assist handle further comprising an elastic member, the push rod comprises a first rod body and a second rod body, the elastic member is disposed between the first rod body and the second rod body, and both ends of the elastic member are connected to the first rod body and the second rod, respectively.

15 [0010] As an optional embodiment of the present invention, the assist handle further comprising a connecting structure, the handle bar comprises a first handle portion and a second handle portion, and the connecting structure is connected with a bottom end of the first handle portion and a top end of the second handle portion.

20 [0011] As an optional embodiment of the present invention, the connecting structure comprises a first connector and a second connector, a proximal end of the first connector is connected with the bottom end of the first handle portion, a proximal end of the second connector is connected with the top end of the second handle portion, wherein a distal end of the first connector and a distal end of the second connector overlap so that the first connector and the second connector form a V-shaped structure.

25 [0012] As an optional embodiment of the present invention, the assist handle further comprising a fixed seat, a sliding groove, a lifting rod and a lifting shaft, the fixed seat is disposed between the door and the handle bar, the sliding groove is provided in the interior of the fixed seat, the lifting rod is inserted in the sliding groove, the lifting shaft is disposed at a proximal end of the lifting rod, and the lifting shaft is pivoted to the distal end of the first connector and the distal end of the second connector.

30 [0013] As an optional embodiment of the present invention, the number of the assist structures is two, one of the assist structures is disposed between the top end of the first handle portion and the door, and the other of the assist structures is disposed between the bottom end of the second handle portion and the door.

35 [0014] The present invention further provides a refrigerator comprising a door and a cabinet, the door being provided with an assist handle which is the assist handle stated above.

40 [0015] 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. In addition, the structure that the handle bar is set as a plurality of interlinked handle portions helps achieve a better force-saving effect.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

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

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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, 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.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] 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.

[0025] 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.

[0026] 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.

[0027] 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.

[0028] 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.

[0029] 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.

[0030] 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.

[0031] 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.

[0032] 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.

[0033] 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.

[0034] 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.

[0035] 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.

[0036] 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.

[0037] 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.

[0038] 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 struc-

ture so as to interlink with one another.

[0039] 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.

[0040] It should be understood that although the description is described according to the embodiments, not every embodiment only comprises one independent technical solution, that such a description manner is only for the sake of clarity, that those skilled in the art should take the description as an integral part, and that the technical solutions in the embodiments may be suitably combined to form other embodiments understandable by those skilled in the art.

[0041] 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. All equivalent embodiments or modifications that do not depart from the art spirit of the present invention should fall within the scope of protection of the present invention.

Claims

1. An assist handle disposed on a front side of a door of a refrigerator, wherein the assist handle comprising:

a handle bar disposed on the front side of the door; and
an assist structure disposed between the handle bar and the door, the assist structure comprises:

a first lever, a lower end of the first lever is connected to a top end of the handle bar;
a first rotation shaft pivoted to the first lever;
a second lever opposed to the first lever;
a second rotation shaft pivoted to the second lever; and

a link disposed between the first lever and the second lever, both ends of the link being pivoted to the first lever and the second lever, respectively;

wherein the handle bar is pulled, and the handle bar drives the first lever to rotate about the first rotation shaft; the first lever drives the link to move linearly; the link drives the second lever to rotate about the

- second rotation shaft.
2. The assist handle according to claim 1, wherein the assist handle further comprising a base, the base has an upper side wall, the upper side wall is perpendicular to the door, the first rotation shaft is disposed on a lower surface of the upper side wall, and the lower surface faces the bottom of the refrigerator. 5
 3. The assist handle according to claim 2, wherein the second rotation shaft is disposed on a surface of the front side of the door. 10
 4. The assist handle according to claim 1, wherein the assist handle further comprising a push rod and a guide groove, the push rod is disposed in the guide groove, and the guide groove runs through the door; wherein an upper end of the second level abuts against a proximal end of the push rod. 15
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 5. The assist handle according to claim 4, wherein the assist handle further comprising an elastic member, the push rod comprises a first rod body and a second rod body, the elastic member is disposed between the first rod body and the second rod body, and both ends of the elastic member are connected to the first rod body and the second rod, respectively. 25
 6. The assist handle according to claim 1, wherein the assist handle further comprising a connecting structure, the handle bar comprises a first handle portion and a second handle portion, and the connecting structure is connected with a bottom end of the first handle portion and a top end of the second handle portion. 30
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 7. The assist handle according to claim 6, wherein the connecting structure comprises a first connector and a second connector, a proximal end of the first connector is connected with the bottom end of the first handle portion, a proximal end of the second connector is connected with the top end of the second handle portion, wherein a distal end of the first connector and a distal end of the second connector overlap so that the first connector and the second connector form a V-shaped structure. 40
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 8. The assist handle according to claim 7, wherein the assist handle further comprising a fixed seat, a sliding groove, a lifting rod and a lifting shaft, the fixed seat is disposed between the door and the handle bar, the sliding groove is provided in the interior of the fixed seat, the lifting rod is inserted in the sliding groove, the lifting shaft is disposed at a proximal end of the lifting rod, and the lifting shaft is pivoted to the distal end of the first connector and the distal end of the second connector. 50
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 9. The assist handle according to claim 7, 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 and the door, and the other of the assist structures is disposed between the bottom end of the second handle portion and the door.
 10. A refrigerator comprising a door and a cabinet, wherein the door is provided with an assist handle which is the assist handle according to any of claims 1-9.

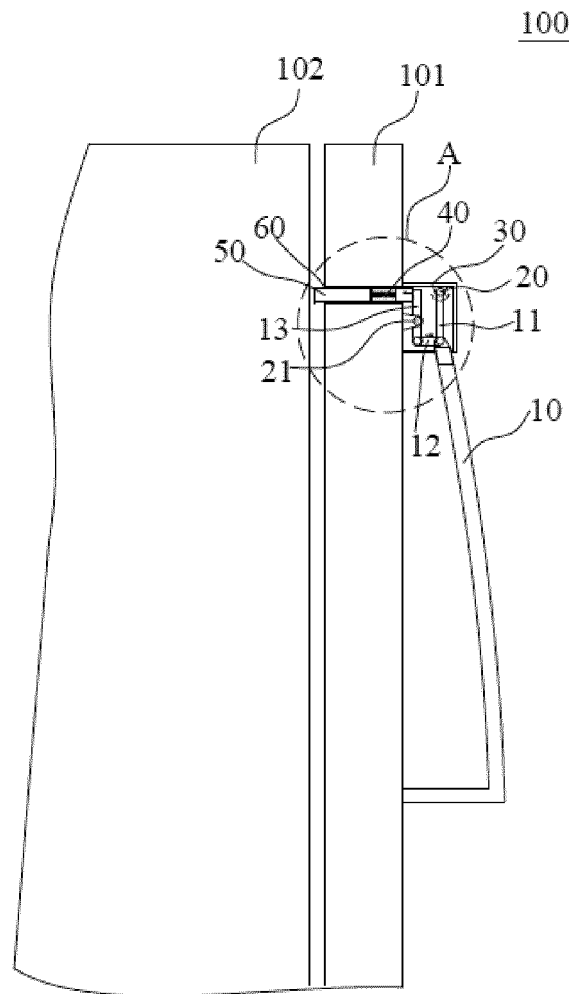


FIG. 1

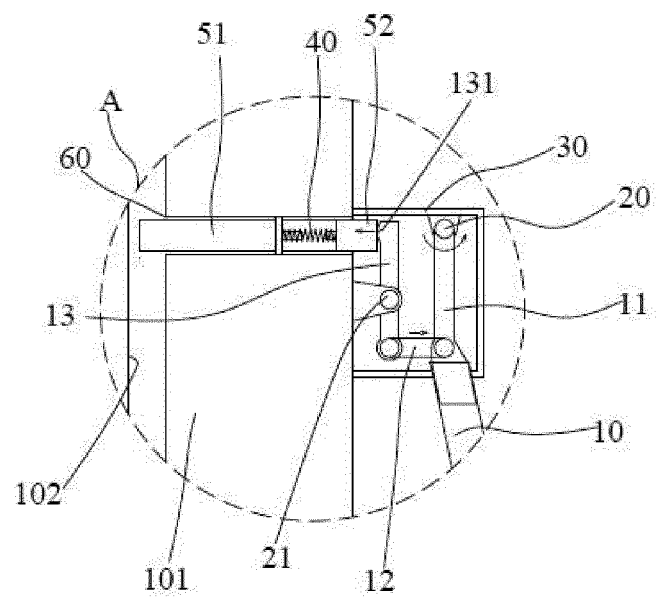


FIG. 2

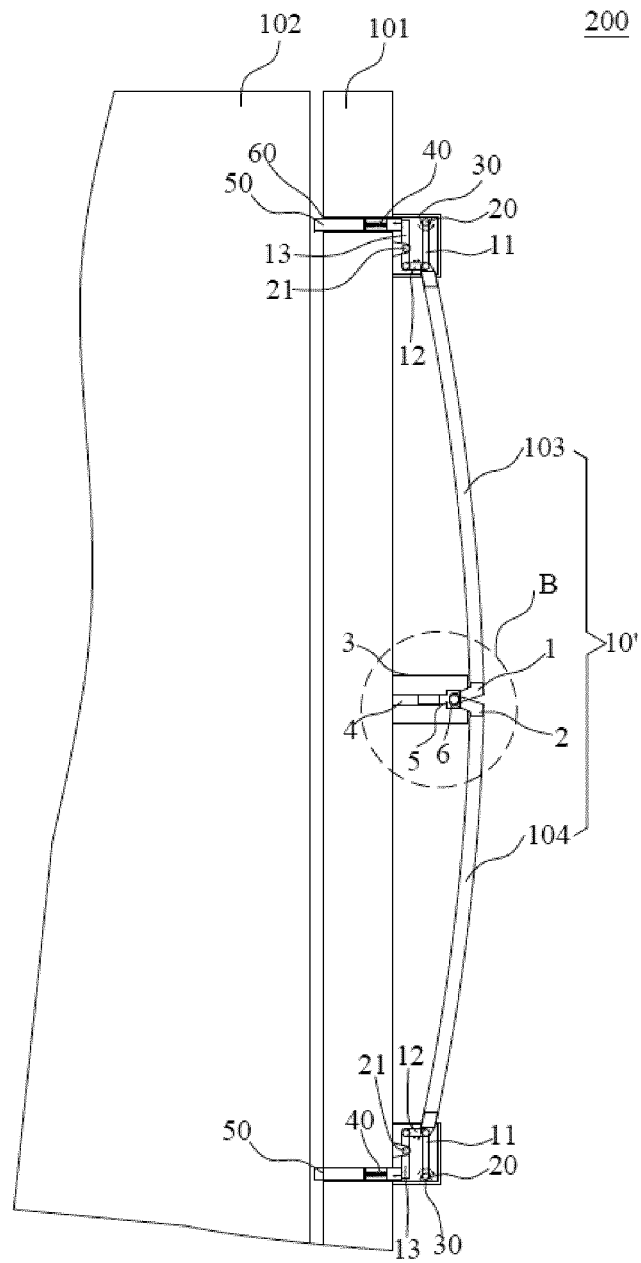


FIG. 3

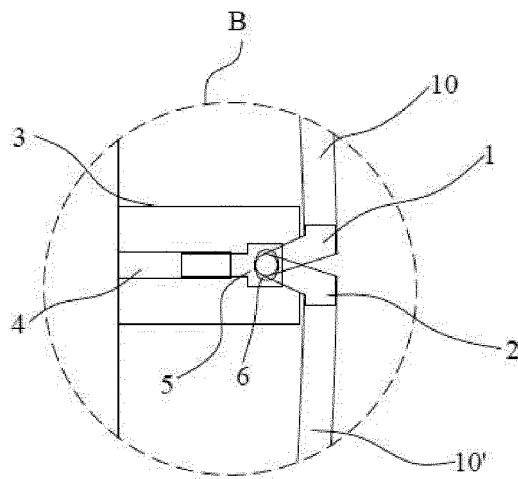


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/111173

A. CLASSIFICATION OF SUBJECT MATTER F25D 23/02(2006.01)i According to International Patent Classification (IPC) or to both national classification and IPC																						
B. FIELDS SEARCHED																						
Minimum documentation searched (classification system followed by classification symbols) F25D 23, F25D 11, E05B 1, E05C 19, E05C 3, E05F 11																						
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched																						
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNABS, CNKI, CNTXT, VEN: 冰箱, 把手, 助力, 门, 推杆, 轴, 杠杆, 连杆, 联动, 连动, 拉手, 槽, 连接件, refrigerator, fridge, handle, door, push, pole, rod, pivot, axis, axes, shaft, lever, rod, bar, linkage, interlock, slot, groove, connecting, adapter, linking																						
C. DOCUMENTS CONSIDERED TO BE RELEVANT																						
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>KR 100880402 B1 (P K TECH SYSTEM CO., LTD.) 20 February 2009 (2009-02-20) description, paragraphs [13]-[32], figures 1-5</td> <td>1-5, 10</td> </tr> <tr> <td>A</td> <td>CN 208382693 U (QINGDAO HAIER SPECIAL FREEZER CO., LTD.) 15 January 2019 (2019-01-15) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 206144272 U (HISENSE SHANDONG REFRIGERATOR CO., LTD.) 03 May 2017 (2017-05-03) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 106369920 A (HISENSE SHANDONG REFRIGERATOR CO., LTD.) 01 February 2017 (2017-02-01) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 207277989 U (QINGDAO HAIGAO DESIGN & MANUFACTURING CO., LTD.) 27 April 2018 (2018-04-27) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 109403717 A (TCL HOUSEHOLD APPLIANCES (HEFEI) CO., LTD.) 01 March 2019 (2019-03-01) entire document</td> <td>1-10</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	KR 100880402 B1 (P K TECH SYSTEM CO., LTD.) 20 February 2009 (2009-02-20) description, paragraphs [13]-[32], figures 1-5	1-5, 10	A	CN 208382693 U (QINGDAO HAIER SPECIAL FREEZER CO., LTD.) 15 January 2019 (2019-01-15) entire document	1-10	A	CN 206144272 U (HISENSE SHANDONG REFRIGERATOR CO., LTD.) 03 May 2017 (2017-05-03) entire document	1-10	A	CN 106369920 A (HISENSE SHANDONG REFRIGERATOR CO., LTD.) 01 February 2017 (2017-02-01) entire document	1-10	A	CN 207277989 U (QINGDAO HAIGAO DESIGN & MANUFACTURING CO., LTD.) 27 April 2018 (2018-04-27) entire document	1-10	A	CN 109403717 A (TCL HOUSEHOLD APPLIANCES (HEFEI) CO., LTD.) 01 March 2019 (2019-03-01) entire document	1-10	
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Date of the actual completion of the international search 01 April 2020	Date of mailing of the international search report 09 April 2020																					
Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088 China	Authorized officer																					
Facsimile No. (86-10)62019451	Telephone No.																					

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/111173

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 102383648 A (QINGDAO HAIER SPECIAL REFRIGERATOR CO., LTD. et al.) 21 March 2012 (2012-03-21) entire document	1-10
A	CN 101871716 A (HEFEI MIDEA-ROYALSTAR REFRIGERATOR CO., LTD. et al.) 27 October 2010 (2010-10-27) entire document	1-10
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A	JP 2006250481 A (SHARP CORPORATION) 21 September 2006 (2006-09-21) entire document	1-10
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2019/111173

Patent document cited in search report			Publication date (day/month/year)		Patent family member(s)		Publication date (day/month/year)	
KR	100880402	B1	20 February 2009		None			
CN	208382693	U	15 January 2019		None			
CN	206144272	U	03 May 2017		None			
CN	106369920	A	01 February 2017		CN	106369920	B	10 May 2019
CN	207277989	U	27 April 2018		None			
CN	109403717	A	01 March 2019		None			
CN	102383648	A	21 March 2012		CN	102383648	B	08 February 2017
CN	101871716	A	27 October 2010		CN	101871716	B	28 November 2012
CN	208380376	U	15 January 2019		None			
JP	2006250481	A	21 September 2006		None			
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