



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
29.11.2023 Bulletin 2023/48

(51) International Patent Classification (IPC):
F25D 23/00 ^(2006.01) **F25D 29/00** ^(2006.01)

(21) Application number: **21920768.5**

(52) Cooperative Patent Classification (CPC):
F25D 23/00; F25D 23/02; F25D 23/06; F25D 29/00

(22) Date of filing: **07.12.2021**

(86) International application number:
PCT/CN2021/135911

(87) International publication number:
WO 2022/156394 (28.07.2022 Gazette 2022/30)

(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
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **22.01.2021 CN 202110090456**

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(54) **REFRIGERATOR**

(57) Provided is a refrigerator, comprising a refrigerator body and a door body located on a front side of the refrigerator body to open or close the refrigerator body, the refrigerator body comprising an inner container and a housing located on an outer side of the inner container; and further comprising a pre-embedded box arranged between the inner container and the housing, and a main control board arranged in the pre-embedded box, wherein the housing is provided with a mounting notch for

mounting the pre-embedded box and a fastening hole close to the mounting notch; and the pre-embedded box has an outer wall surface attached to an inner wall of the housing and a fastening structure protruding from the outer wall surface, the fastening structure passing through the fastening hole and then fastened and fixed to the housing. According to the present invention, the assembly efficiency of the pre-embedded box can be greatly improved.

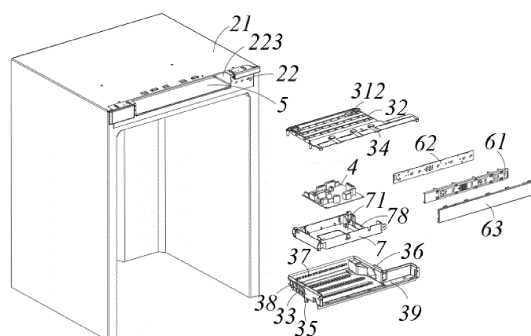


FIG.5

Description

TECHNICAL FIELD

[0001] The present invention relates to a refrigerator, and in particular, to a refrigerator easy to assemble.

BACKGROUND

[0002] A main control board of an existing refrigerator is generally mounted in a foaming layer between a housing and an inner container by a pre-embedded box; first, the pre-embedded box is required to be fixed between the housing and the inner container, and usually, the pre-embedded box and the housing are fixed directly by screws; however, during fixation by the screws, hole positions between the pre-embedded box and the housing are required to be aligned for fixation, but the pre-embedded box is required to be kept in a stable state for the alignment of the hole positions, and once the hole positions are offset, fixation cannot be realized, thus greatly affecting an assembly efficiency.

[0003] In view of this, the existing refrigerator is necessary to be improved to solve the above-mentioned problem.

SUMMARY

[0004] An object of the present invention is to provide a refrigerator easy to repair.

[0005] The present invention is directed to a refrigerator comprising: a refrigerator body and a door body located on a front side of the refrigerator body to open or close the refrigerator body, the refrigerator body comprising an inner container and a housing located on an outer side of the inner container, wherein the refrigerator further comprises a pre-embedded box provided between the inner container and the housing, and a main control board provided in the pre-embedded box, the housing has a mounting notch for mounting the pre-embedded box and a fastening hole provided close to the mounting notch, the pre-embedded box has an outer wall surface attached to an inner wall of the housing and a fastening structure formed by protruding from the outer wall surface, and the fastening structure penetrates through the fastening hole to be fixedly buckled to the housing.

[0006] Further, the fastening structure has an extending portion perpendicularly extending from the outer wall surface of the pre-embedded box towards the housing, a buckling portion extending from the extending portion towards the mounting notch, and a first buckling cavity formed between the buckling portion and the outer wall surface of the pre-embedded box, and a height of a part of an inner cavity of the first buckling cavity close the mounting notch is greater than a height of a part of the inner cavity adjacent to the extending portion.

[0007] Further, the buckling portion has a greater ex-

tension length than the extending portion, and an inclined surface extending obliquely towards an interior of the first buckling cavity is formed at an end of the buckling portion close to the mounting notch.

[0008] Further, the pre-embedded box further has an abutting structure protruding from the outer wall surface to abut against an edge of the mounting notch of the housing, and the abutting structure and the fastening structure are spaced apart in a front-rear direction.

[0009] Further, the abutting structure is further provided with a clamping portion extending towards the fastening structure, a second buckling cavity for accommodating the edge of the mounting notch of the housing is formed between the clamping portion and the outer wall surface of the pre-embedded box, and an inclined guide surface is formed on a side of an extending tail end of the clamping portion apart from the second buckling cavity.

[0010] Further, the fastening structure and the abutting structure are staggered in a width direction of the pre-embedded box.

[0011] Further, the pre-embedded box has a top wall, a bottom wall, two side walls and a rear wall connected between the top wall and the bottom wall, and an opening formed in a side between the top wall and the bottom wall opposite to the rear wall, the opening is communicated with the mounting notch, the outer wall surface of the pre-embedded box attached to the inner wall of the housing is configured as the top wall of the pre-embedded box, and the main control board is parallel to the top wall and the bottom wall.

[0012] Further, the pre-embedded box comprises a base and a top cover which are in butt connection with each other, and the top wall and the bottom wall are formed on the top cover and the base respectively.

[0013] Further, the top cover has screw holes formed in an up-down direction, and the refrigerator further comprises screws for fixing the top cover to the housing.

[0014] Further, the base further has supporting legs protruding downwards to be supported on the inner container.

[0015] The present invention has the following beneficial effects. A housing of the refrigerator according to the present invention has a mounting notch for mounting a pre-embedded box and a fastening hole provided close to the mounting notch, the pre-embedded box has an outer wall surface attached to an inner wall of the housing and a fastening structure formed by protruding from the outer wall surface, and the fastening structure penetrates through the fastening hole to be fixedly buckled to the housing. Therefore, when the pre-embedded box is assembled and fixed, the pre-embedded box can be pre-fixed to the housing, and then, the pre-embedded box and the housing are further fixed by screws, thus greatly improving an assembly efficiency of the pre-embedded box.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

FIG. 1 is a schematic perspective diagram of a refrigerator according to a first embodiment of the present invention.

FIG. 2 is a perspective exploded view of FIG. 1.

FIG. 3 is a schematic perspective diagram of FIG. 1 from another perspective after a housing is hidden.

FIG. 4 is an enlarged view at A of FIG. 3.

FIG. 5 is a further perspective exploded view of FIG. 2.

FIG. 6 is a perspective exploded view of a pre-embedded box and a mounting base of FIG. 5.

FIG. 7 is a schematic perspective diagram of FIG. 5 from another perspective.

FIG. 8 is a perspective exploded view of a pre-embedded box and a mounting base of FIG. 7.

FIG. 9 is an enlarged view at B of FIG. 8.

FIG. 10 is a front exploded view after an inner container and a housing body are hidden.

FIG. 11 is a perspective exploded view of a mounting base and a display control assembly in a second embodiment of the present invention.

FIG. 12 is a schematic perspective diagram of FIG. 11 from another perspective.

DETAILED DESCRIPTION

[0017] In order to make those skilled in the art to better understand the technical solutions of the present invention, the technical solutions in the embodiments of the present invention are clearly and completely described with reference to the accompanying drawings in the embodiments of the present invention, and apparently, the described embodiments are not all but only a part of the embodiments of the present invention. All other embodiments obtained by a person of ordinary skill in the art based on the embodiments of the present invention without creative efforts shall fall within the protection scope of the present invention.

[0018] Reference is made to FIGS. 1 to 12 which show embodiments of a refrigerator according to the present invention, the refrigerator comprises a refrigerator body and a door body located on a front side of the refrigerator body to open or close the refrigerator body, the refrigerator body comprises an inner container 1 and a housing 2 located on an outer side of the inner container, the refrigerator further comprises a pre-embedded box 3 provided between the inner container 1 and the housing 2, and a main control board 4 provided in the pre-embedded box 3, the housing 2 has a mounting notch 223 for mounting the pre-embedded box 3 and a fastening hole 23 provided close to the mounting notch 223, the pre-embedded box 3 has an outer wall surface attached to an inner wall of the housing 2 and a fastening structure 34 formed by protruding from the outer wall surface, and the fasten-

ing structure 34 penetrates through the fastening hole 23 to be fixedly buckled to the housing 2.

[0019] Specifically, as shown in FIGS. 1 to 3 which show a first embodiment of the present invention, in the present embodiment, the refrigerator is configured as an embedded refrigerator and mainly provided in a cupboard, and certainly, the refrigerator can be configured as a traditional refrigerator. A foaming cavity 5 is formed between the housing 2 and the inner container 1, the refrigerator further has a heat insulating layer provided between the housing 2 and the inner container 1 adjacent to the mounting box 3, and the heat insulating layer can be formed in the foaming cavity 5 by foaming or have a vacuum heat insulating design.

[0020] In the present embodiment, the housing 2 comprises an assembled housing body 21, and a reinforcing beam 22 provided on a front side of the housing body 21, the reinforcing beam 22 has a first wall 221 extending in a front-rear direction, and a second wall 222 formed by bending from the first wall 221 towards the inner container 1 (that is, bent and extending in an up-down direction), and the opening 31 of the mounting box 3 penetrates through the second wall 222 forwards. The first wall 221 of the reinforcing beam 22 is fixed to a top wall of the housing 2, the second wall 222 is fixed to a part of a side wall of the housing 2 bent in a transverse direction, and the whole reinforcing beam 22 is fixed inside the housing 2 and provided at a foremost end of the housing 2, thereby increasing integrity of the housing 2.

[0021] In the present embodiment, the mounting notch 223 is provided on the first wall 221 and the second wall 222 of the reinforcing beam 22 and is through in the up-down direction. That is, it can be understood that the mounting notch 223 is formed by recessing a front end of the first wall 221 and the second wall 222 backwards.

[0022] Since the pre-embedded box 3 in the present invention is provided between the housing 2 and the inner container 1, by independently providing a reinforcing beam 22, a housing body 21 and the inner container 1 can be conveniently connected, structural strength of the pre-embedded box 3 is improved, a process is simpler, and a production efficiency is higher. Certainly, in other embodiments, the housing body 21 and the reinforcing beam 22 can be integrally formed.

[0023] In the present embodiment, the pre-embedded box 3 is provided between a top wall of the housing 2 and the inner container 1 and located on a front side of a foaming cavity 5. On the one hand, since an area of the top wall is less than an area of a side wall, the foaming cavity 5 between the top wall and the inner container 1 can be easily thickened to prevent the pre-embedded box 3 from protruding from the housing 2, and the foaming cavity 5 between the thickened top wall and the inner container 1 has a lower cost compared with the foaming cavity 5 between the thickened side wall and the inner container 1.

[0024] On the other hand, generally, a storage compartment on an upper side of the refrigerator is configured

as a refrigerating chamber, and has a relatively higher storage temperature than a freezing chamber, such that the temperature of the refrigerating chamber is not prone to influence work of the main control board 4. Meanwhile, with the main control board 4 provided at this position, a repair person is not required to bend down for work, thus reducing repair difficulty.

[0025] Certainly, in other embodiments, the pre-embedded box 3 can be provided in the foaming cavity 5 between the side wall and the inner container 1, or the foaming cavity 5 between the refrigerating chamber and the freezing chamber. When the pre-embedded box 3 is provided in the foaming cavity 5 between the side wall and the inner container 1, only part of the pre-embedded box 3 can be provided to protrude from the side wall of the housing 2, and then, the cupboard is provided with an accommodating structure fitted with the protruding structure. When the pre-embedded box 3 is provided in the foaming cavity 5 between the refrigerating chamber and the freezing chamber, a heat insulating performance of the pre-embedded box 3 should be increased to reduce an influence of a low temperature of the freezing chamber thereon.

[0026] In the present embodiment, the mounting box 3 is provided adjacent to the inner wall of the housing 2; that is, the mounting box 3 is attached to the top wall of the housing 2, such that a distance between a bottom of the mounting box 3 and the inner container 1 can be increased, thereby increasing a thickness of the heat insulating layer therebetween, and then reducing the influence of the temperature in the storage compartment on the main control board; heat generated when the main control board 4 works can be conducted out through the housing 2 made of metal, thus improving a heat dissipation effect. Meanwhile, under a condition of a sufficient heat preservation effect, the distance between the top wall of the housing 2 and the inner container 1 can be minimized; that is, the foaming cavity 5 is thinnest, and a size of the refrigerator is reduced.

[0027] In the present embodiment, the pre-embedded box 3 has a top wall, a bottom wall, two side walls and a rear wall connected between the top wall and the bottom wall, and an opening 31 formed in a side between the top wall and the bottom wall opposite to the rear wall, the opening 31 is communicated with the mounting notch 223, the outer wall surface of the pre-embedded box 3 attached to the inner wall of the housing is configured as the top wall of the pre-embedded box 3, and the main control board 4 is parallel to the top wall and the bottom wall.

[0028] A part of the pre-embedded box 3 corresponding to the upper mounting notch 223 protrudes into the upper mounting notch 223 and covers an inner wall of the upper mounting notch 223. That is, the inner wall of the upper mounting notch 223 is provided to be fitted with an outer wall of the pre-embedded box 3. A position where the opening 31 of the pre-embedded box 3 penetrates through a second wall 222 is communicated with

the front mounting notch 223, such that an upper front end of the pre-embedded box 3 is exposed outside.

[0029] Therefore, during repair, the repair person cannot touch the reinforcing beam 22, and even when the opening 31 of the pre-embedded box 3 is not quite large, the repair person can only touch a plastic structure of the pre-embedded box 3, such that the repair person cannot be scratched by a metal structure of the reinforcing beam 22, thus reducing an injury risk of the repair person. Certainly, in other embodiments, the pre-embedded box 3 may not protrude into the mounting notch 223; that is, the outer wall of the pre-embedded box 3 is provided to be attached to an inner wall surface of a first wall 221.

[0030] As shown in FIGS. 4 to 7, the pre-embedded box 3 comprises a top cover 32 and a base 33 which are assembled to each other up and down, such that forming and assembly are simpler; the top wall and the bottom wall are formed on the top cover 32 and the base 33 respectively. Certainly, in other embodiments, the pre-embedded box 3 can be integrally formed. The top cover 32 has screw holes formed in an up-down direction, and the refrigerator further comprises screws for fixing the top cover 32 to the housing 2.

[0031] In the present embodiment, the fastening hole 23 is provided in the top wall of the housing 2, and penetrates through the housing body 21 and the first wall 221 of the reinforcing beam 22 in the up-down direction. The fastening structure 34 has an extending portion 341 perpendicularly extending from the outer wall surface of the pre-embedded box 3 towards the housing, a buckling portion 342 extending from the extending portion towards the mounting notch, and a first buckling cavity 343 formed between the buckling portion 342 and the outer wall surface of the pre-embedded box 3, and a height of a part of an inner cavity of the first buckling cavity 343 close the mounting notch 223 is greater than a height of a part of the inner cavity adjacent to the extending portion 341.

[0032] The buckling portion 342 has a greater extension length than the extending portion 341, and an inclined surface extending obliquely towards an interior of the first buckling cavity 343 is formed at an end of the buckling portion 342 close to the mounting notch 223. With the above-mentioned structure, the pre-embedded box 3 and the housing 2 are pre-fixed, the greater extension length of the buckling portion 342 can guarantee a good fixing effect, and the inclined surface can ensure that the top wall of the housing 2 smoothly enters the first buckling cavity 343.

[0033] In the present embodiment, in order to improve the pre-fixing effect of the pre-embedded box 3 and the housing 2, the pre-embedded box 3 further has an abutting structure 30 protruding from the outer wall surface to abut against an edge of the mounting notch 223 of the housing 2, the abutting structure 30 and the fastening structure 34 are spaced apart in a front-rear direction, and the fastening structure 34 and the abutting structure 30 are staggered in a width direction of the pre-embedded box 3, such that the above structure is conveniently

formed in a limited space of the pre-embedded box 3.

[0034] The abutting structure 30 is further provided with a clamping portion 301 extending towards the fastening structure 34, a second buckling cavity 302 for accommodating the edge of the mounting notch 223 of the housing 2 is formed between the clamping portion 301 and the outer wall surface of the pre-embedded box 3, and an inclined guide surface 303 is formed on a side of an extending tail end of the clamping portion 301 apart from the second buckling cavity 302. The pre-fixing effect can be further enhanced by fitting the abutting structure 30 with the fastening structure 34, and the fitting between the abutting structure 30 and the fastening structure 34 can reduce a risk of damage to the fastening structure 34 and/or the abutting structure 30.

[0035] With the above structure, the pre-embedded box 3 and the housing 2 can be pre-fixed, a screw fixing mode is avoided, the screws penetrate through the top cover 32 to damage the main control board 4 in the pre-embedded box 3, and meanwhile, the repair person can be prevented from being scratched by the screws. After prepositioning, hole positions between the pre-embedded box 3 and the housing 2 are aligned, and then, fixation is further performed using the screws, such that the pre-embedded box 3 is not required to be held with the hand during fixation by the screws, thus improving an assembly efficiency.

[0036] In the present embodiment, the mounting box 3 has supporting legs 35 protruding downwards from a lower surface of the lower cover 33 to be supported on the inner container 1, and the supporting legs 35 can assist the prepositioning structure, improve a prepositioning effect, and meanwhile reduce a risk of damage to the clamping structure 34.

[0037] The mounting box 3 has a wire harness passing hole 36 for providing a wire harness, and in the present embodiment, the wire harness passing hole 36 is located on a transverse side, and due to the arrangement on the transverse side, during repair by the repair person, the wire harness is relatively closer to the repair person, such that the repair person can conveniently perform a check and repair. Certainly, in other embodiments, the wire harness passing hole can be located on a rear side.

[0038] The mounting box 3 further has a ventilation hole 37 for communicating the foaming cavity 5 with the interior of the mounting box 3. The refrigerator further comprises a breathable film (not shown) provided at the ventilation hole 37 on an outer side of the mounting box 3. In the present embodiment, the ventilation hole 37 is mainly provided on the lower cover 33. By providing the ventilation hole 37 and the breathable film, during foaming, communication with the external world can be realized to reduce a foaming pressure, such that the foaming process is smoother; the breathable film can ensure that a foaming material cannot enter the mounting box 3, thus avoiding a risk of material spilling of the mounting box 3.

[0039] In the present embodiment, the mounting box 3 defines a first accommodating cavity 38 located on the

rear side and a second accommodating cavity 39 located on the front side, the first accommodating cavity 38 is communicated with the second accommodating cavity 39, a width of the second accommodating cavity 39 in the transverse direction is greater than a width of the first accommodating cavity 38 in the transverse direction, and the first accommodating cavity 38 is configured to accommodate the main control board 4.

[0040] The mounting box 3 further has two front side walls 391 formed on both sides of the second accommodating cavity 39, a front top wall and a front bottom wall formed on an upper side and a lower side of the second accommodating cavity 39 respectively, two rear side walls 381 formed on both sides of the first accommodating cavity 38, a connecting wall 392 for connecting a rear end of the front side wall 391 and a front end of the rear side wall 381 on the same side, and a rear top wall and a rear bottom wall formed on an upper side and a lower side of the first accommodating cavity 38 respectively, the front top wall and the rear top wall are located on the same plane, and the front bottom wall and the rear bottom wall are located on the same plane. The front top wall and the rear top wall are formed on the upper cover 32, and the front bottom wall and the rear bottom wall are formed on the lower cover 33.

[0041] In the present embodiment, the connecting wall 392 is located on a rear side of the second accommodating cavity 39, the connecting wall 392 is formed between the front side wall 391 and the rear side wall 381 on one side, and the front side wall 391 and the rear side wall 381 on opposite sides are located on the same plane. That is, one side of the first accommodating cavity 39 and one side of the second accommodating cavity 38 in the transverse direction are flush, and only the other side of the first accommodating cavity 39 is longer than the other side of the second accommodating cavity 38.

[0042] The mounting box 3 has an extension wall 361 protruding outwards from a periphery of the wire harness passing hole 36 of the rear side wall 381, and the extension wall 361 is provided around the wire harness passing hole 36. Therefore, the extension wall 361 can facilitate other wire harnesses to go deep into the mounting box 3, and meanwhile facilitate sealing with respect to other structures, so as to prevent the foaming material from permeating through the wire harness passing hole 36.

[0043] The refrigerator further comprises a display control assembly 6 fitted at the opening 31 and electrically connected with the main control board 4, and the second accommodating cavity 39 is configured to accommodate the display control assembly 6; on the one hand, the display control assembly 6 has a greater transverse width than the main control board 4, and the second accommodating cavity 39 facilitates mounting of the display control assembly 6; on the other hand, during repair, the second accommodating cavity 39 is provided on the front side of the mounting box 3, and the repair person has a larger operation space and can more conveniently perform repair. Certainly, in other embodiments, a cover

plate can be fitted at the opening 31, and is only required to cover the main control board 4.

[0044] Specifically, the display control assembly 6 comprises a display control bracket 61, a display control circuit board 62 fixed on the display control bracket 61, and a display control panel 63 covering a front side of the display control bracket 61, the refrigerator further comprises a fixing structure provided between the display control panel 63 and the mounting box 3, and the fixing structure comprises a hook 64 provided on one of the display control panel 63 and the mounting box 3 and a clamping groove 311 provided on the other of the display control panel 63 and the mounting box 3.

[0045] In the present embodiment, the hook 64 is provided on the display control panel 63, the clamping groove 311 is provided on an inner wall of the mounting box 3, and the display control bracket 61 and the display control panel 63 are fixed together, such that the display control panel 63 can be directly detached during repair, and meanwhile, the display control bracket 61 and the display control circuit board 62 are detached together, thereby simplifying repair steps. The display control assembly 6 is provided on a front side of the main control board 4, thus reducing a length of a wire harness between the display control assembly 6 and the main control board 4, and facilitating a reasonable arrangement and tidying of the wire harness. Moreover, the display control assembly 6 is provided at the opening 31 of the mounting box 3, and can further function as the cover plate to cover the main control board 4; that is, the display control assembly 6 and the cover plate are integrated.

[0046] The mounting box 3 further has extending sheets 331 extending from the two front side walls to both sides, and the extending sheets 331 are provided with mounting holes for fixing the reinforcing beam 22, thereby further reinforcing fixation of the mounting box 3. In the present embodiment, left and right sides of the display control panel 63 extend to front sides of the extending sheets 331, such that the extending sheets 331 can stop the display control panel 63 from further moving backwards, thereby preventing the display control assembly 6 from pressing the main control board assembly; meanwhile, the mounting holes can be shielded, thereby increasing an aesthetic degree.

[0047] As shown in FIGS. 8 to 10, the refrigerator further comprises a mounting base 7 provided in a first accommodating cavity 38 for mounting the main control board 4, and the mounting base 7 has an inner mounting cavity 71 for mounting the main control board 4. In the present embodiment, the mounting base 7 has a structure similar to a drawer, a front wall of the mounting base 7 further has a front-back through wire passing hole 72 and a wire binding clip 73 protruding forwards to fix a wire harness, the wire harness connecting the display control assembly 6 and the main control board 4 passes through the wire passing hole 72, and the wire binding clip 73 is configured to tidy the wire harness.

[0048] The wire passing hole 72 is located on a trans-

verse side of the front wall of the mounting base 7, the wire passing hole 72 and the wire harness passing hole 36 of the mounting box 3 are located on the same side, and the wire binding clip 73 is approximately located at a middle position of the front wall of the mounting base 7. Therefore, the wire harness passing through the wire passing hole 72 can be directly connected with the wire harness passing through the wire harness passing hole 36, a length of the wire harness is shortened, and then, the wire harness is orderly arranged by the wire binding clip 73.

[0049] The mounting base 7 further has a supporting portion 74 protruding from an inner bottom wall of the inner mounting cavity 71 to support the main control board 4. In the present embodiment, the mounting base 7 has a plurality of supporting portions 74 provided around the inner mounting cavity 71, and the supporting portions 74 are further connected to an inner side wall around the inner mounting cavity 71, so as to increase structural strength of the supporting portions 74. The supporting portion 74 can be configured to increase a distance between the main control board 4 and a bottom wall of the inner mounting cavity 71, so as to avoid that when condensation occurs in the mounting base 7, the condensation comes into contact with the main control board 4, and ensure that the main control board 4 works stably.

[0050] The mounting base 7 further has a buckle 75 protruding from an inner side wall of the inner mounting cavity 71, the buckle 75 is fitted with a supporting portion 74 to fix the main control board 4, and the buckle 75 has a guide surface facilitating up-down mounting of the main control board 4. In the present embodiment, each of other side walls of the inner mounting cavity 71 than a front wall is provided with an elastic arm 76, the elastic arm 76 is configured as a part of the side wall of the inner mounting cavity 71, both sides of the elastic arm 76 are spaced apart from the side wall of the inner mounting cavity 71, and the buckle 75 is provided on the elastic arm 76, such that the elastic arm 76 moves close to or away from the inner mounting cavity 71 easily, and the main control board 4 is easier to mount and dismount.

[0051] Certainly, in other embodiments, the mounting base 7 may not have the front wall, and the main control board 4 can be mounted between the limiting buckle 75 and the supporting portion 74 along the front-rear direction.

[0052] In the present embodiment, the mounting base 7 further has a through hole 77 which is through in the up-down direction to expose the bottom of the main control board 4; the arrangement of the through hole 77 can reduce a material cost of the mounting base 7 and improve a heat dispersion performance, and meanwhile can further increase the original distance between the main control board 4 and the inner bottom wall of the inner mounting cavity 71 to become a distance between the main control board 4 and the lower cover 33 of the mounting box 3; even when the condensation appears,

the condensation can flow into the mounting box 3 through the through hole 77, thereby further improving a waterproof performance.

[0053] The mounting base 7 further comprises an outer mounting cavity 78 provided beside the inner mounting cavity 71 to accommodate a wire harness, and a wire binding portion 781 protruding from an inner wall of the outer mounting cavity 78. In the present embodiment, the outer mounting cavity 78 is formed on left and right sides and a rear side of the inner mounting cavity 71, and the outer mounting cavity 78 means a space formed by outermost side walls of the mounting base 7 in a transverse direction and the front-rear direction and the side wall of the inner mounting cavity 71, thereby providing a large space for arranging the wire harness; the wire binding portion 781 is formed by protruding from the inner wall of the outer mounting cavity 78.

[0054] The outer mounting cavity 78 near a passing hole 36 side has a plurality of first wiring grooves 782, and the side wall of the inner mounting cavity 71 has a plurality of second wiring grooves 711 fitted with the first wiring grooves 782. In the present embodiment, the outer mounting cavity 78 near the passing hole 36 side has two first wiring grooves 782 on left and right sides for providing different wire harnesses, thereby avoiding disorder of the wire harnesses. The second wiring grooves 711 are formed through the side wall of the inner mounting cavity 71 and are distributed at different positions, so as to be orderly and neatly connected to corresponding positions on the main control board 4. Certainly, in other embodiments, numbers of the first wiring grooves 782 and the second wiring grooves 711 can be correspondingly set according to actual products.

[0055] In the present embodiment, the wire binding portion 781 has a structure with a hook-shaped tail end, the wire binding portion 781 is formed by protruding outwards from an outer wall surface of the side wall of the inner mounting cavity 71, and most wire harnesses are attached to the outer wall surface of the side wall of the inner mounting cavity 71 when the wire harnesses are connected with the main control board 4 through the first wiring groove 782 and the second wiring groove 711, such that the wire harnesses can be more effectively tied by the wire binding portion 781, thus reducing a probability that the wire harness is separated from the wire binding portion 781.

[0056] A positioning structure for positioning the mounting base 7 and the pre-embedded box 3 is further provided therebetween. In the present embodiment, the positioning structure comprises a first elastic portion 79 provided on the mounting base 7 to elastically abut against the pre-embedded box 3 in the up-down direction, and a second elastic portion 721 elastically abutting against the pre-embedded box 3 in the transverse direction. Certainly, in other embodiments, the first elastic portion 79 and the second elastic portion 721 can be provided on the pre-embedded box 3.

[0057] By arranging the first elastic portion 79 abutting

in the up-down direction and the second elastic portion 721 abutting in the transverse direction, on the one hand, the mounting base 7 and the pre-embedded box 3 can be fully fixed; on the other hand, a resistance is small during front-rear movement of the mounting base 7, thus facilitating dismounting and mounting.

[0058] Specifically, the pre-embedded box 3 has a first abutting portion 312 and a second abutting portion 313 which protrude inwards and abut against the first elastic portion 79 and the second elastic portion 721 respectively, and the first abutting portion 312 and the second abutting portion 313 are arranged on a rear side of the pre-embedded box 3 and obliquely extend towards the interior of the pre-embedded box 3 gradually from front to rear, so as to form guide inclined surfaces 314 for the first elastic portion 79 and the second elastic portion 721 to move back and forth. Therefore, during both mounting and dismounting of the mounting base 7, a movement space of the mounting base 7 in the first half of the interior of the pre-embedded box 3 is large, thus facilitating mounting and dismounting; meanwhile, the large space facilitates heat dissipation.

[0059] In the present embodiment, the first abutting portion 312 and the second abutting portion 313 are provided at a rearmost end inside the pre-embedded box 3, such that the movement space in the first half of the interior of the pre-embedded box 3 can be maximized. The first elastic portions 79 are formed on left and right sides of a rear end of the mounting base 7, the first elastic portion 79 is formed by extending upwards from an upper end of an outer side wall of the outer mounting cavity 78 and bending backwards, and the mounting base 7 further has an escaping space 722 located below the first elastic portion 79 to facilitate downward bent deformation of the first elastic portion 79. Therefore, the first elastic portion 79 can conveniently move up and down during front-rear movement of the mounting base 7.

[0060] The second elastic portion 721 is formed by protruding from an outer side of the side wall of the mounting base 7, and an escaping space 722 for the second elastic portion 721 to deform inwards is also provided on the outer side of the side wall of the mounting base 7. In the present embodiment, the second elastic portions 721 are provided on left and right sides of the mounting base 7, and certainly, in other embodiments, the second elastic portions 721 can be provided on two sides in the transverse direction.

[0061] A transverse protruding width of the second abutting portion 313 near the passing hole 36 side of the pre-embedded box 3 is greater than a protruding width of the other second abutting portion 313, thereby ensuring that the pre-embedded box 3 on the passing hole 36 side has a sufficient space to arrange the wire harness.

[0062] Certainly, in other embodiments, the pre-embedded box 3 can be provided with only one or both of the first abutting portion 312 and the second abutting portion 313, and the mounting base 7 is directly in interference fit with the first abutting portion 312 and/or the

second abutting portion 313.

[0063] The mounting base 7 and the pre-embedded box 3 are further fixed by other parts; specifically, a fixing portion 723 protruding outwards is further provided on a front wall of the mounting base 7, a fixing hole 315 fitted with the fixing portion 723 is formed on a rear inner wall of a second accommodating cavity, and the fixing portion 723 and the fixing hole 315 are fixed by one screw.

[0064] In the present embodiment, one end of the second accommodating cavity 39 is aligned with the first accommodating cavity 38, such that the rear inner wall of the second accommodating cavity 39 is only located on one transverse side; the rear inner wall of the second accommodating cavity 39 is further provided with a groove which is recessed backwards to accommodate the fixing portion 723, such that a front end surface of the fixing portion 723 is flush with the rear inner wall, and smooth mounting of a display control assembly 6 is guaranteed.

[0065] Meanwhile, the passing hole 36 of the pre-embedded box 3 is provided on a rear side of a part of the second accommodating cavity 39 longer than the first accommodating cavity 38, such that a wire passing hole 72 is approximately located at a middle position of a width of the second accommodating cavity 39 in the transverse direction, thereby better facilitating connection of the wire harness and the display control circuit board 62; that is, a difference of lengths of the wire harnesses connected to the display control circuit board 62 is less, tidying and an arrangement are easier, and selection of the display control circuit board 62 is wider.

[0066] The fixing portion 723 on the other side in the transverse direction is fitted with a protrusion 316 protruding from the pre-embedded box 3, and the protrusion 316 is also provided with the fixing hole 315, such that a fixing effect of the mounting base 7 can be effectively guaranteed by the first elastic portion 79, the second elastic portion 721, the fixing portion 723 and the fixing hole 315.

[0067] The refrigerator further comprises appearance parts 8 provided on left and right sides of the display control assembly 6, and the appearance parts 8 are fixed on the reinforcing beam 22, thus preventing the reinforcing beam 22 from being exposed, and improving the aesthetic degree. The appearance parts 8 on the left and right sides have inconsistent sizes, and the appearance part 8 on a door hinge side is smaller.

[0068] As shown in FIGS. 11 and 12 which show a second embodiment of the refrigerator of the present invention different from the first embodiment in that: the display control assembly 6 comprises a display control bracket 61 integrally formed on the front side of the mounting base 7, a display control circuit board 62 fixed on a rear side of the display control bracket 61, and a display control panel 63 covering a front side of the display control bracket 61.

[0069] That is, the front wall of the mounting base 7 and the display control bracket 61 are configured as the

same structure, such that the main control board 4 and the display control circuit board 62 can be fixed conveniently, more materials are saved, and the cost is effectively reduced. In the present embodiment, the display control circuit board 62 is provided between the display control bracket 61 and the main control board 4 and located in the inner mounting cavity 71, such that the display circuit board can be directly connected with the main control board 4 in the inner mounting cavity 71, a distance between the display circuit board and the main control board is shorter, and the wire harness connecting the display circuit board and the main control board is not required to penetrate out of the mounting base 7 forwards, thereby reducing wire harness tidying difficulty.

[0070] In addition, since the display control panel 63 and the display control bracket 61 are also fixed together, during disassembly and repair, a fixing structure between the display control panel 63 and the mounting box 3 can be directly released, and then, the display control panel 63 can be directly pulled out. Therefore, the main control board 4 can be taken out in one step, and the repair steps are greatly simplified. Certainly, the premise is that the mounting base 7 and the mounting box 3 are fixed only by the above-mentioned positioning structure, the fixing tab 723 and the screw hole 315 of the mounting base 7 are not fixed by a screw, or the fixing tab 723 and the screw hole 315 are not necessarily provided.

[0071] In summary, the housing 2 of the refrigerator according to the present invention has the mounting notch 223 for mounting the pre-embedded box 3 and the fastening hole 23 provided close to the mounting notch 223, the pre-embedded box 3 has the outer wall surface attached to the inner wall of the housing 2 and the fastening structure 34 formed by protruding from the outer wall surface, and the fastening structure 34 penetrates through the fastening hole 23 to be fixedly buckled to the housing 2. Therefore, when the pre-embedded box 3 is assembled and fixed, the pre-embedded box 3 can be pre-fixed to the housing 2, and then, the pre-embedded box 3 and the housing 2 are further fixed by the screws, thus greatly improving the assembly efficiency of the pre-embedded box 3.

[0072] It should be understood that although the present specification is described based on embodiments, not every embodiment contains only one independent technical solution. Such a narration way of the present specification is only for the sake of clarity. Those skilled in the art should take the present specification as an entirety. The technical solutions in the respective embodiments can be combined properly to form other embodiments which can be understood by those skilled in the art.

[0073] A series of the detailed descriptions set forth above is merely specific description of feasible embodiments of the present invention, and is not intended to limit the protection scope of the present invention. Equivalent embodiments or modifications made within the spirit of the present invention shall fall within the protection

scope of the present invention.

Claims

1. A refrigerator, comprising: a refrigerator body and a door body located on a front side of the refrigerator body to open or close the refrigerator body, the refrigerator body comprising an inner container and a housing located on an outer side of the inner container, wherein the refrigerator further comprises a pre-embedded box provided between the inner container and the housing, and a main control board provided in the pre-embedded box, the housing has a mounting notch for mounting the pre-embedded box and a fastening hole provided close to the mounting notch, the pre-embedded box has an outer wall surface attached to an inner wall of the housing and a fastening structure formed by protruding from the outer wall surface, and the fastening structure penetrates through the fastening hole to be fixedly buckled to the housing.
2. The refrigerator according to claim 1, wherein the fastening structure has an extending portion perpendicularly extending from the outer wall surface of the pre-embedded box towards the housing, a buckling portion extending from the extending portion towards the mounting notch, and a first buckling cavity formed between the buckling portion and the outer wall surface of the pre-embedded box, and a height of a part of an inner cavity of the first buckling cavity close the mounting notch is greater than a height of a part of the inner cavity adjacent to the extending portion.
3. The refrigerator according to claim 2, wherein the buckling portion has a greater extension length than the extending portion, and an inclined surface extending obliquely towards an interior of the first buckling cavity is formed at an end of the buckling portion close to the mounting notch.
4. The refrigerator according to any one of claims 1 to 3, wherein the pre-embedded box further has an abutting structure protruding from the outer wall surface to abut against an edge of the mounting notch of the housing, and the abutting structure and the fastening structure are spaced apart in a front-rear direction.
5. The refrigerator according to claim 4, wherein the abutting structure is further provided with a clamping portion extending towards the fastening structure, a second buckling cavity for accommodating the edge of the mounting notch of the housing is formed between the clamping portion and the outer wall surface of the pre-embedded box, and an inclined guide surface is formed on a side of an extending tail end

of the clamping portion apart from the second buckling cavity.

6. The refrigerator according to claim 5, wherein the fastening structure and the abutting structure are staggered in a width direction of the pre-embedded box.
7. The refrigerator according to claim 1, wherein the pre-embedded box has a top wall, a bottom wall, two side walls and a rear wall connected between the top wall and the bottom wall, and an opening formed in a side between the top wall and the bottom wall opposite to the rear wall, the opening is communicated with the mounting notch, the outer wall surface of the pre-embedded box attached to the inner wall of the housing is configured as the top wall of the pre-embedded box, and the main control board is parallel to the top wall and the bottom wall.
8. The refrigerator according to claim 7, wherein the pre-embedded box comprises a base and a top cover which are in butt connection with each other, and the top wall and the bottom wall are formed on the top cover and the base respectively.
9. The refrigerator according to claim 8, wherein the top cover has screw holes formed in an up-down direction, and the refrigerator further comprises screws for fixing the top cover to the housing.
10. The refrigerator according to claim 8, wherein the base further has supporting legs protruding downwards to be supported on the inner container.

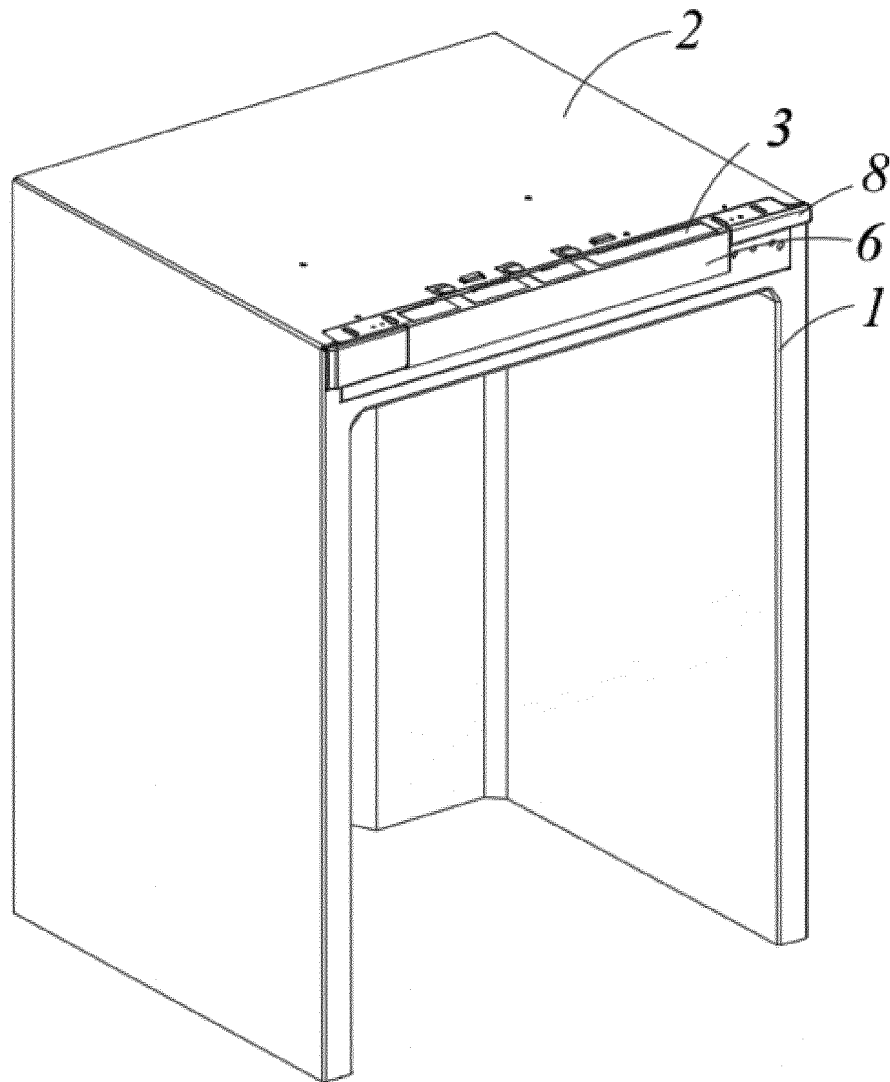


FIG.1

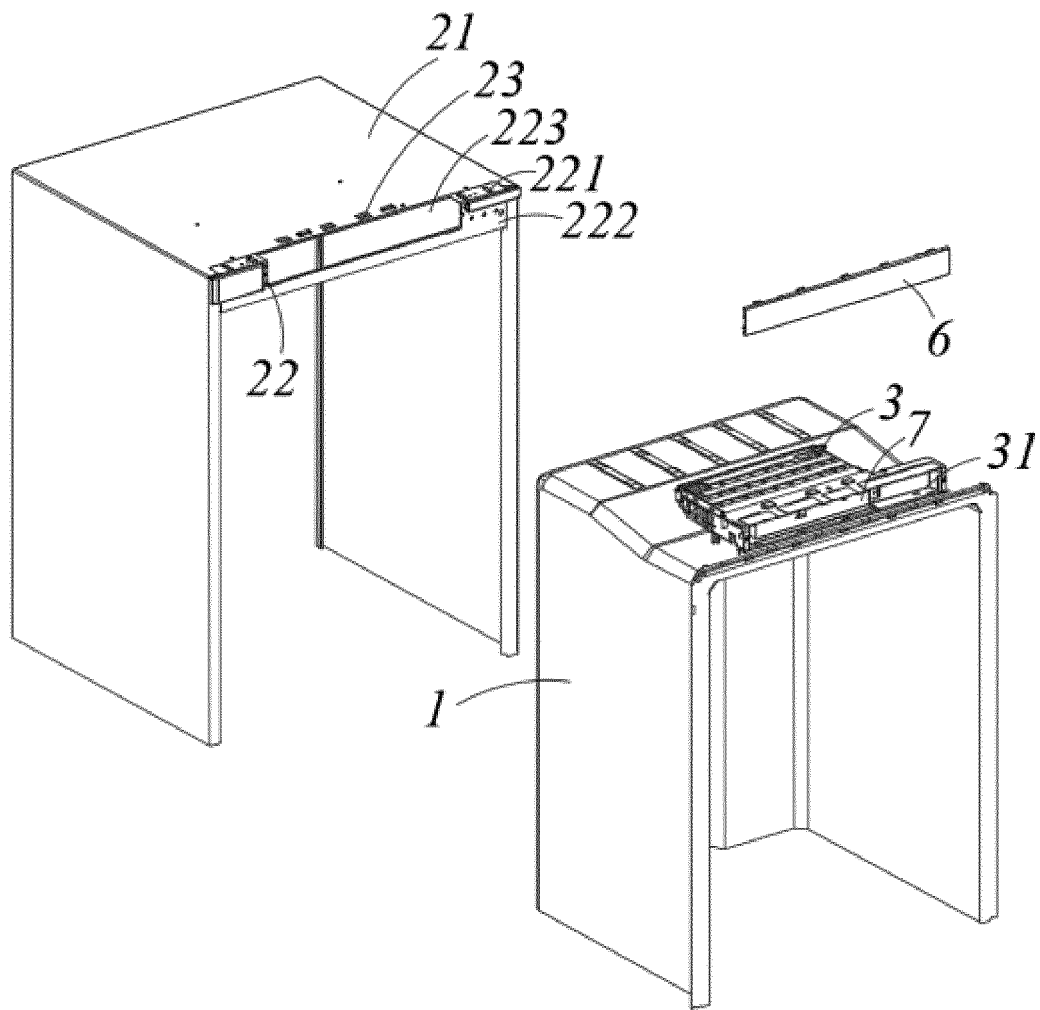


FIG.2

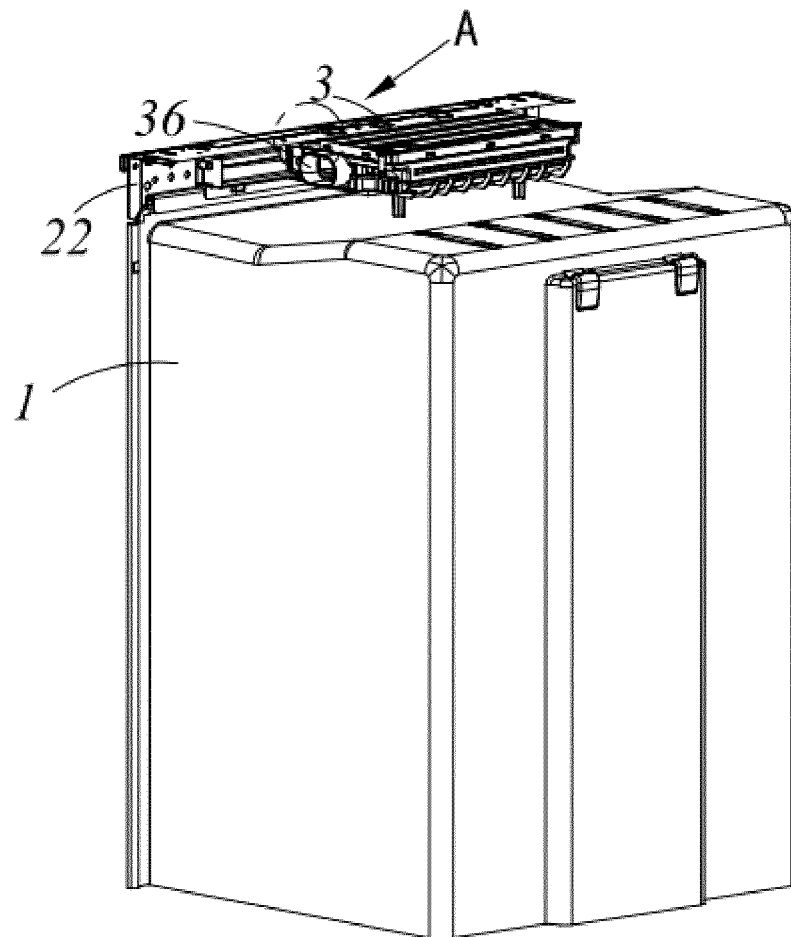


FIG.3

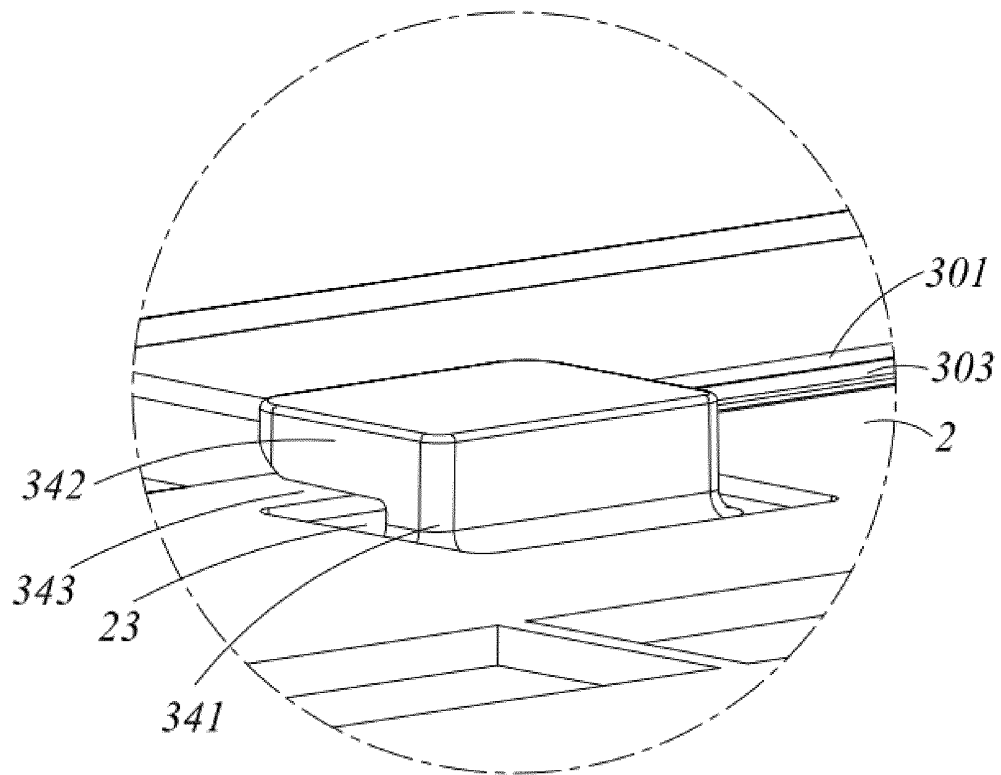


FIG. 4

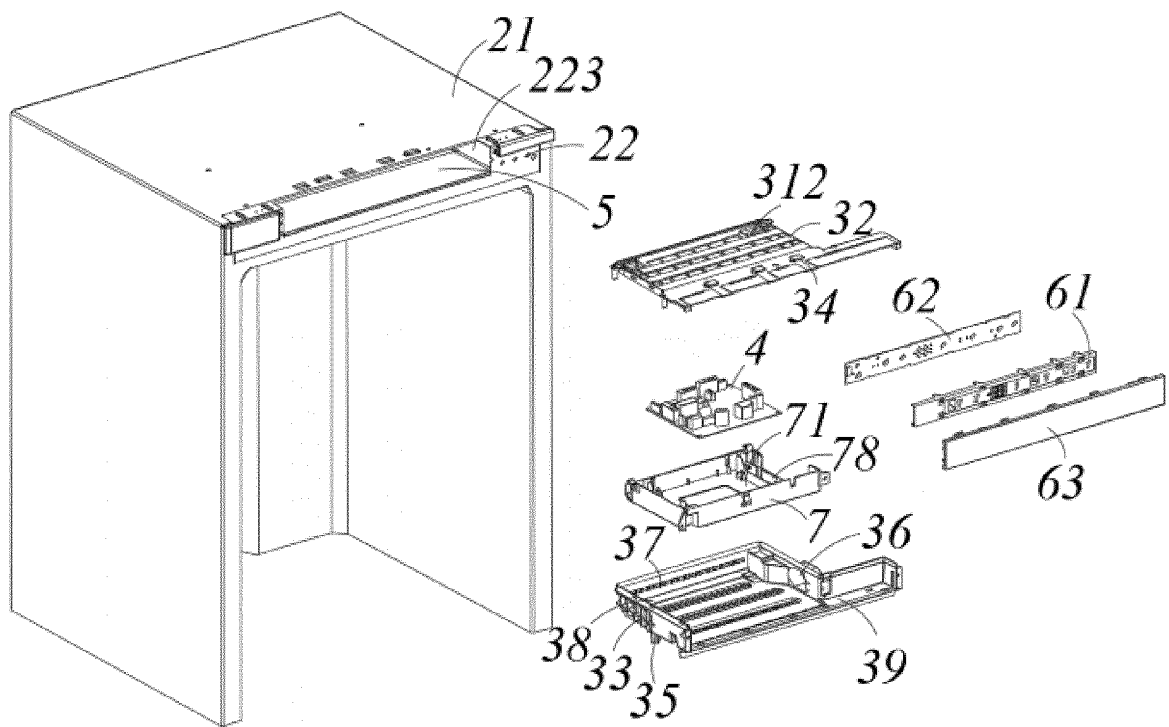


FIG. 5

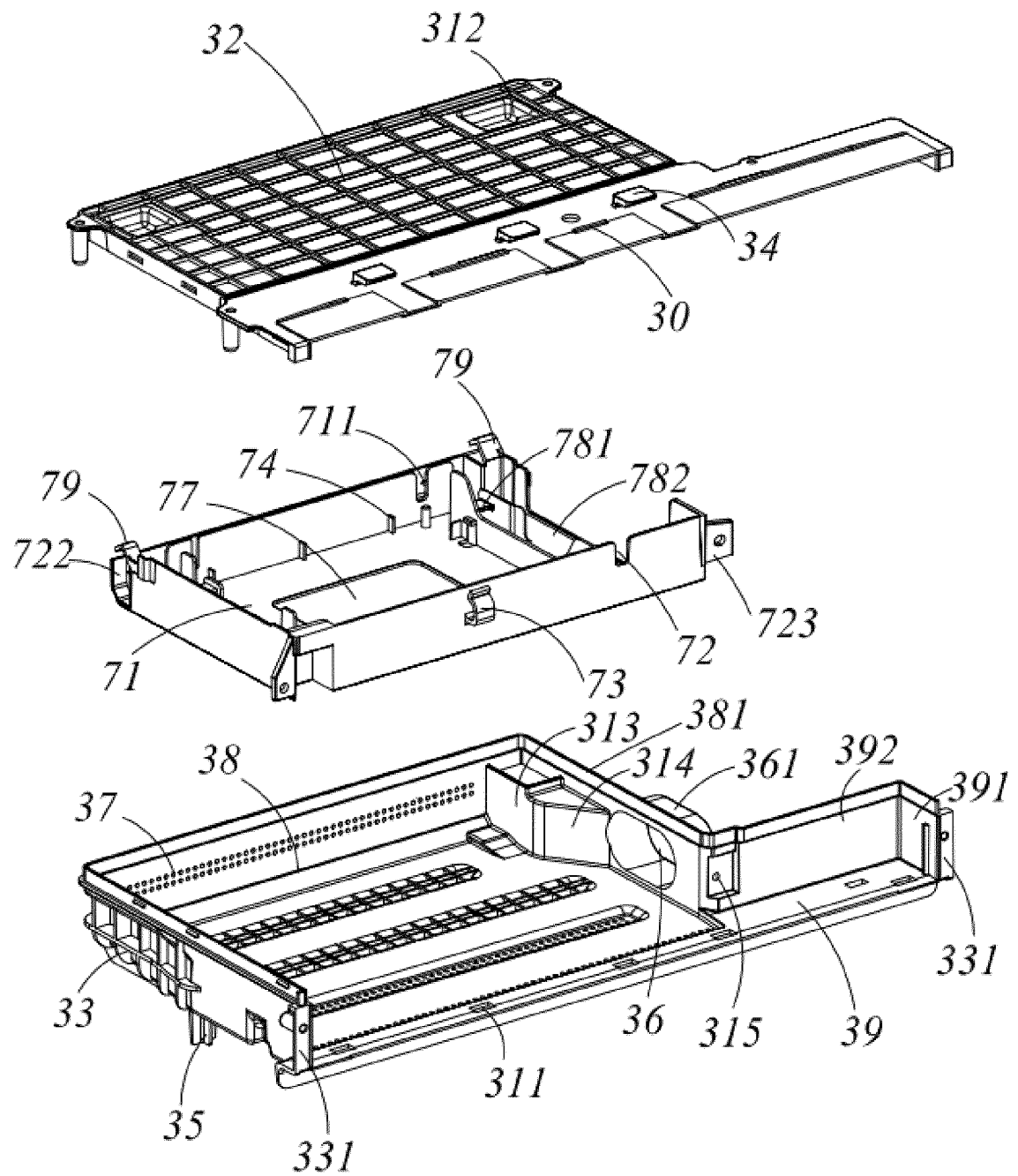


FIG.6

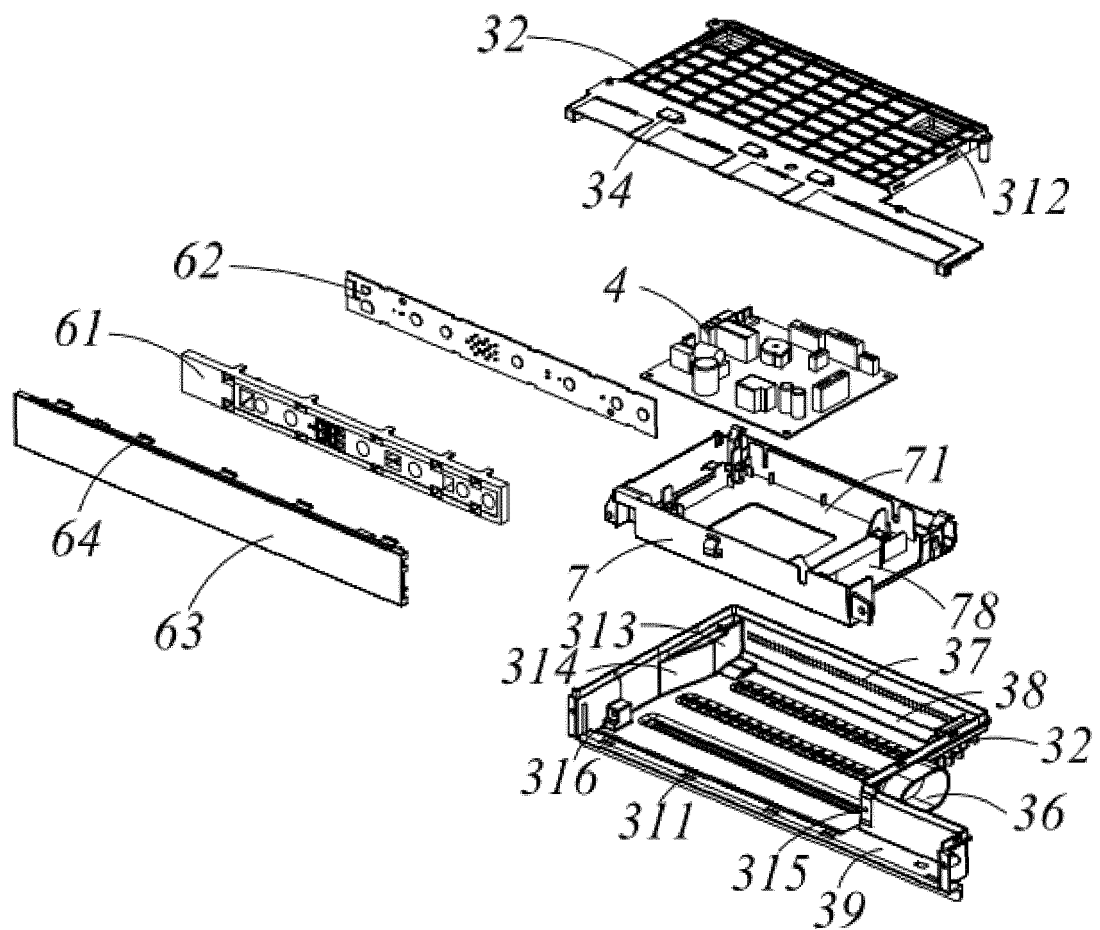


FIG.7

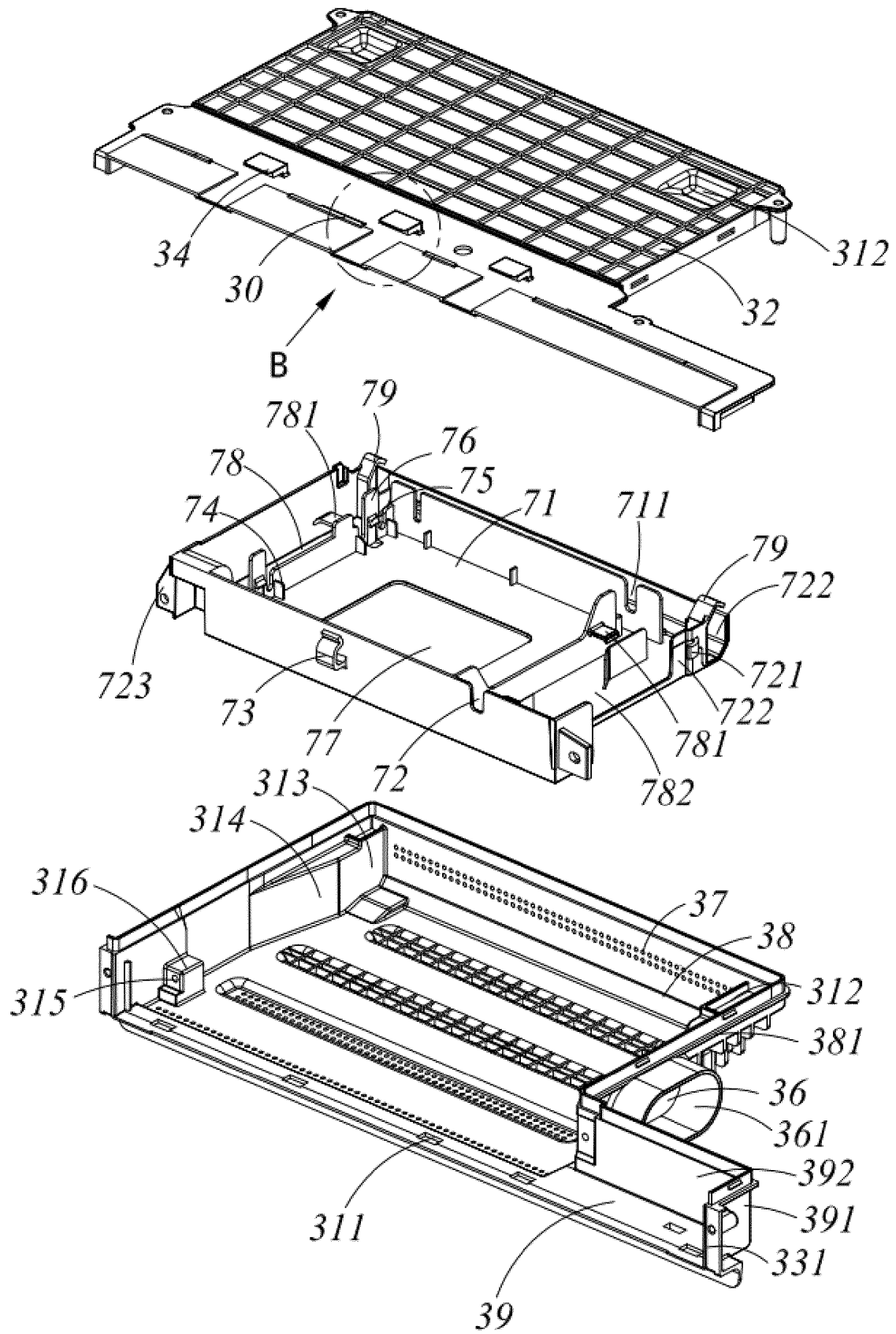


FIG.8

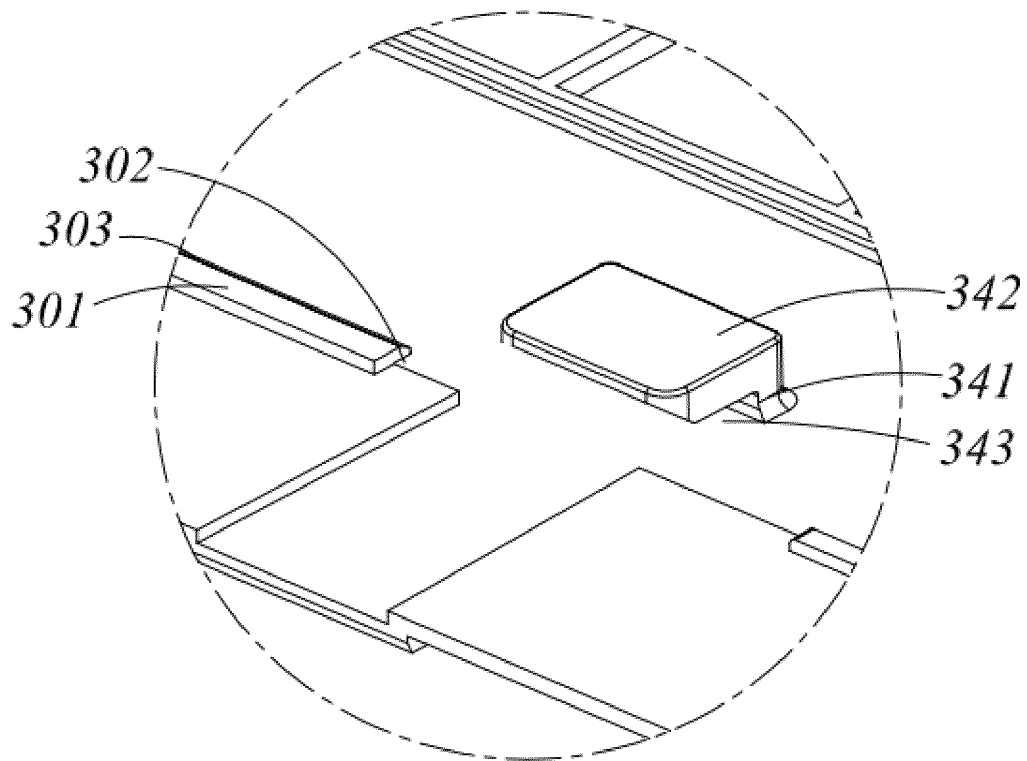


FIG. 9

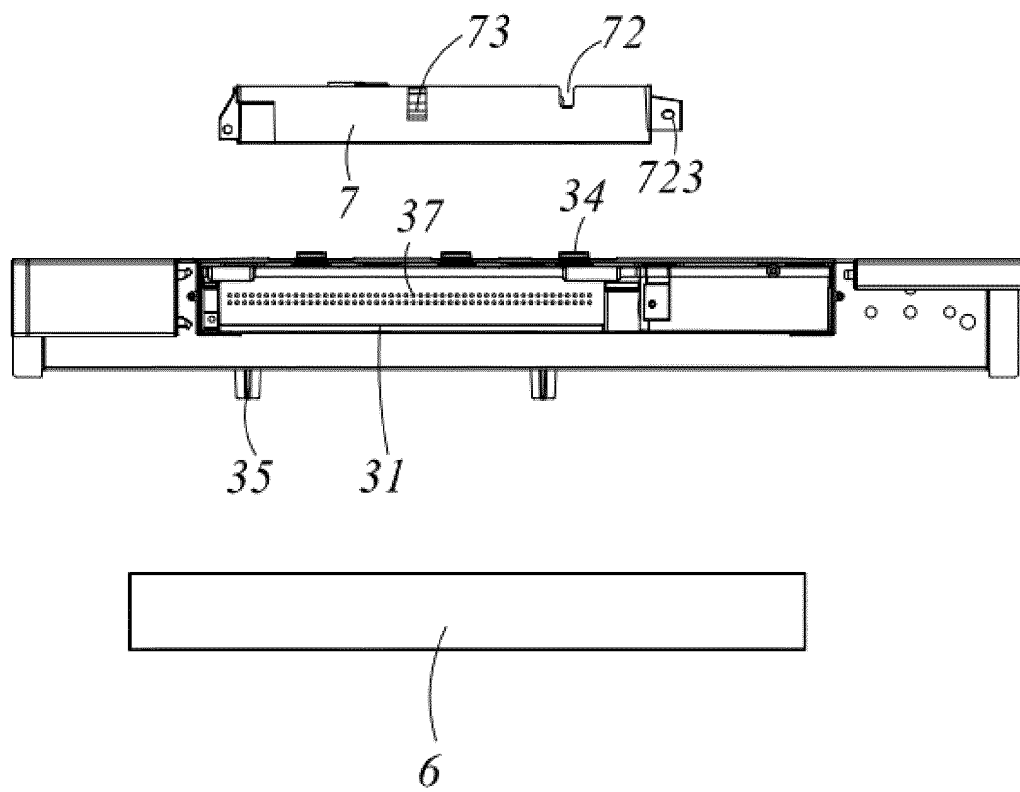


FIG. 10

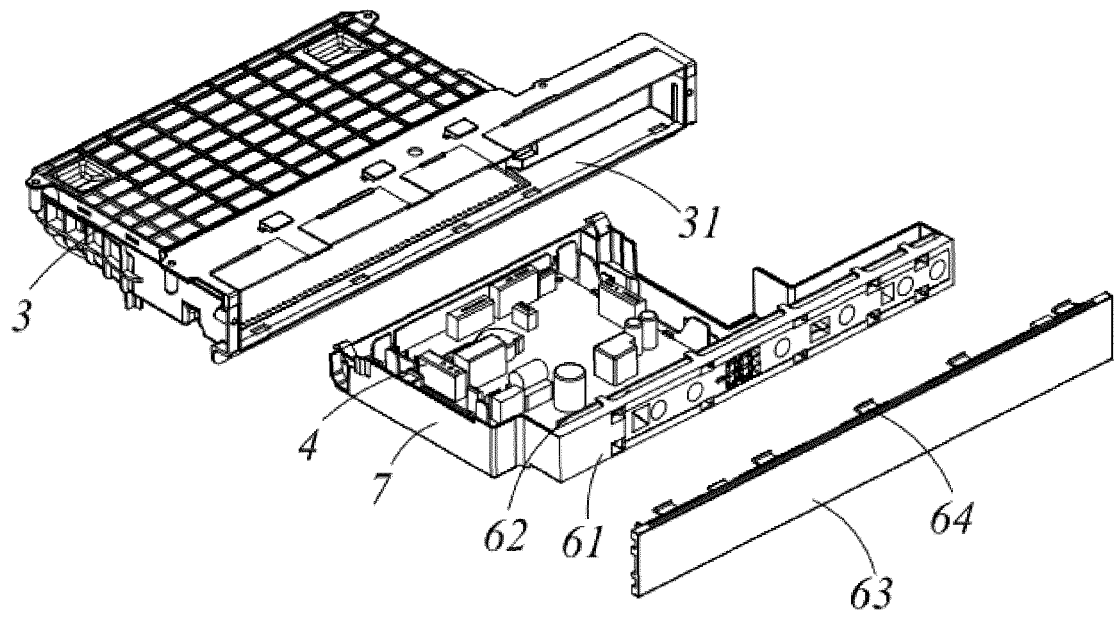


FIG.11

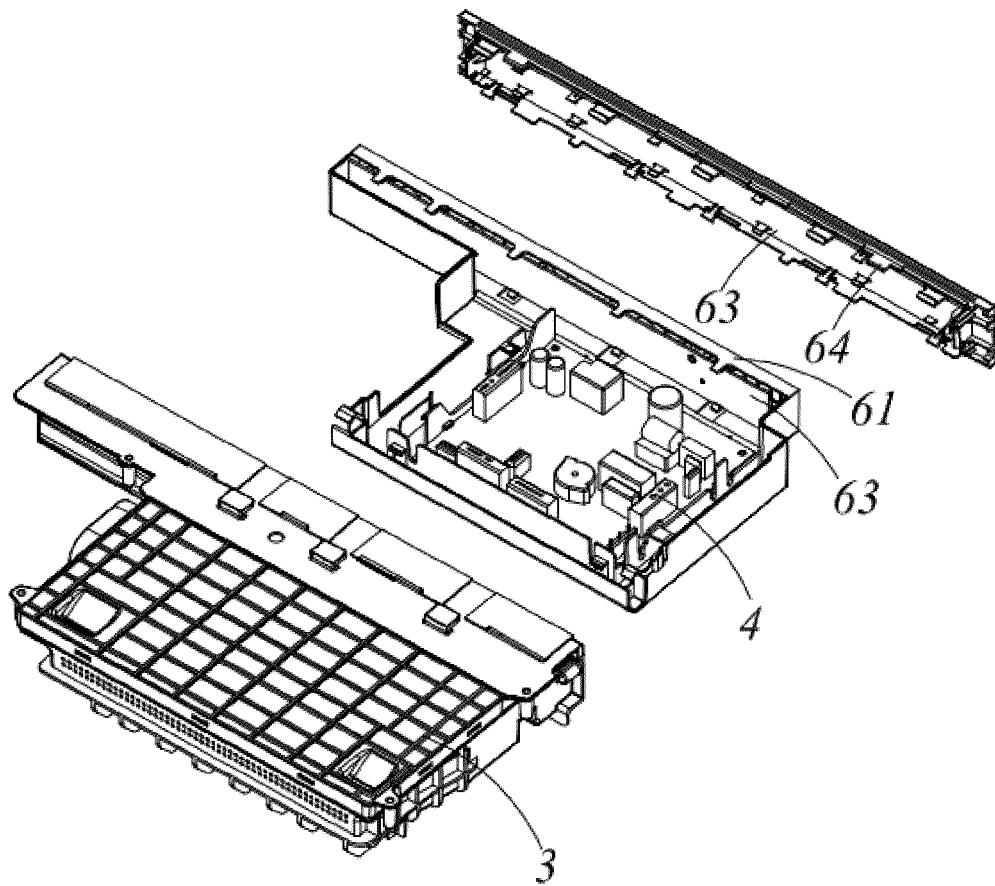


FIG.12

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2021/135911

A. CLASSIFICATION OF SUBJECT MATTER

F25D 23/00(2006.01)i; F25D 29/00(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)

F25D11 F25D23 F25D29

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, CNTXT, CNKI, DWPI: 主控板 控制板 电路板PCB 盒 容纳 孔 槽 control+ circuit board box container case hole aperture orifice slot groove

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 214537040 U (QINDAO HAIER REFRIGERATOR CO., LTD. et al.) 29 October 2021 (2021-10-29) description paragraphs [0034]- [0084] and figures 1-11	1-10
PX	CN 214537039 U (QINDAO HAIER REFRIGERATOR CO., LTD. et al.) 29 October 2021 (2021-10-29) description, paragraphs [0032]-[0082] and figures 1-11	1-10
Y	CN 111649517 A (HISENSE RONSHEN (GUANGDONG) REFRIGERATORS CO., LTD.) 11 September 2020 (2020-09-11) description paragraphs [0040]- [0088] and figures 1-11	1-4, 7-10
Y	CN 106766663 A (HEFEI HUALING CO., LTD. et al.) 31 May 2017 (2017-05-31) description, paragraphs [0071]-[0072] and figures 1-9	1-4, 7-10
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A	CN 102937368 A (HEFEI MIDEA ROYALSTAR REFRIGERATOR CO., LTD.) 20 February 2013 (2013-02-20) entire document	1-10

☒ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

24 February 2022

Date of mailing of the international search report

02 March 2022

Name and mailing address of the ISA/CN

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Authorized officer

Facsimile No. (86-10)62019451

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/135911

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2021/135911

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