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(54) **REFRIGERATOR**

(57) The present invention provides a refrigerator; the refrigerator comprises a refrigerator body, and a door body located on the 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 the outer side of the inner container; and the refrigerator further comprises a mounting box provided between the inner container and the housing, and a main control board provided in the mounting box, the mounting box being provided with an opening opened forwards to mount and disassemble the main control board. The present invention can greatly simplify the maintenance steps, shorten the maintenance time, and reduce the maintenance costs.

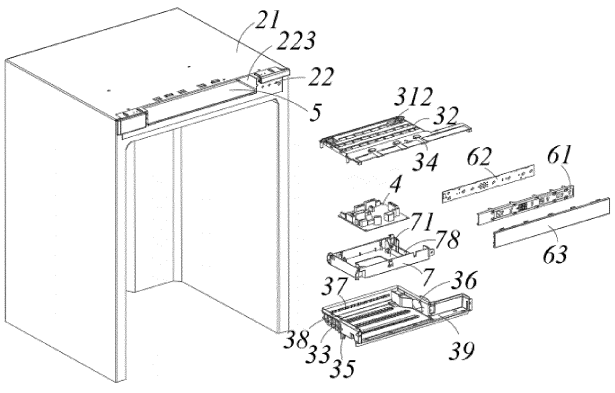


FIG.5

EP 4 283 231 A1

Description

TECHNICAL FIELD

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

BACKGROUND

[0002] A main control board of an existing refrigerator is generally placed in a compressor bin, the mounted refrigerator is required to be pulled out by a certain distance during repair, a cover plate of the compressor bin can be then conveniently detached, and the main control board is taken out for repair, thus adding great difficulty for repair of the refrigerator; in the process of pulling out the refrigerator, accidents are prone to occurrence to cause external impact or friction damage to the refrigerator, or even an injury of a repair person.

[0003] Especially, for an embedded refrigerator, since the embedded refrigerator is mounted in a cupboard, a fixing structure between the refrigerator and the cupboard is required to be released before the refrigerator is pulled out, and therefore, repair is more complicated and time-consuming.

[0004] In view of this, the existing refrigerator is necessary to be improved to solve the above-mentioned problem.

SUMMARY

[0005] An object of the present invention is to provide a refrigerator easy to repair.

[0006] 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 mounting box provided between the inner container and the housing, and a main control board provided in the mounting box, and the mounting box has an opening opened forwards for mounting and dismounting the main control board.

[0007] Further, the mounting box is provided adjacent to an inner wall of the housing.

[0008] Further, the housing has a top wall and two side walls, the mounting box is provided between the top wall and the inner container, and the refrigerator further has a heat insulating layer provided between the housing and the inner container adjacent to the mounting box.

[0009] Further, the refrigerator further comprises a prepositioning structure for assembling the mounting box and the housing to each other, the prepositioning structure is provided between the mounting box and the housing and located on a front side of the mounting box, and the prepositioning structure comprises a clamping structure provided on one of the mounting box and the housing and a fitting structure provided on the other of the mounting box and the housing.

[0010] Further, the fitting structure is provided on the housing and configured as a through hole, and the clamping structure comprises a first clamping portion fixed to the fitting structure, and a second clamping portion located on a front side of the first clamping portion and fixed to a front end wall of the housing.

[0011] Further, the mounting box further has supporting legs protruding downwards to be supported on the inner container.

[0012] Further, a notch opened forwards is provided at a position of the housing adjacent to the opening of the mounting box, and a part of the mounting box corresponding to the notch protrudes into the notch and covers an inner wall of the notch.

[0013] Further, the housing comprises a housing body and a reinforcing beam provided on a front side of the housing body, the reinforcing beam has a first wall extending in a front-rear direction, and a second wall formed by bending from the first wall towards the inner container, and the notch and the opening correspondingly penetrate through the first wall and the second wall respectively.

[0014] Further, the refrigerator further comprises a mounting base provided in the mounting box for mounting the main control board, and the mounting base has an inner mounting cavity for mounting the main control board.

[0015] Further, the mounting base further has a supporting portion protruding from an inner bottom wall of the inner mounting cavity to support the main control board.

[0016] Further, the mounting base further has a buckle protruding from an inner side wall of the inner mounting cavity, and the buckle is fitted with the supporting portion to fix the main control board.

[0017] Further, the mounting base further has a through hole which is through in an up-down direction to expose a bottom of the main control board.

[0018] Further, the mounting base further comprises an outer mounting cavity provided beside the inner mounting cavity to accommodate a wire harness, and a wire binding portion protruding from an inner wall of the outer mounting cavity.

[0019] Further, the mounting box has a passing hole for providing the wire harness, the outer mounting cavity near the passing hole side has a plurality of first wiring grooves, and the side wall of the inner mounting cavity has a plurality of second wiring grooves fitted with the first wiring grooves.

[0020] Further, a positioning structure for positioning the mounting base and the mounting box is further provided therebetween, the positioning structure comprises a first abutting portion and a second abutting portion protruding inwards from the mounting box and fixed to the mounting base, the first abutting portion is formed by protruding in the up-down direction, and the second abutting portion is formed by protruding in a transverse direction.

[0021] Further, the mounting base has a first elastic portion and a second elastic portion which abut against the first abutting portion and the second abutting portion respectively, and the first elastic portion and the second elastic portion are arranged on a rear side of the mounting base.

[0022] Further, a foaming cavity is formed between the housing and the inner container, and the mounting box has a ventilation hole for communicating the foaming cavity with the interior of the mounting box.

[0023] Further, the refrigerator further comprises a breathable film provided at the ventilation hole on an outer side of the mounting box.

[0024] The present invention has the following beneficial effects. In the refrigerator according to the present invention, a mounting box is provided between an inner container and a housing, a main control board is provided in the mounting box, and the mounting box has an opening opened forwards for mounting and dismounting the main control board. Therefore, during repair, a structure on a front side of the mounting box can be directly detached, and then, the main control board is pulled out forwards, which greatly simplifies repair steps, reduces a repair time, reduces a repair cost, and meanwhile is not prone to damage to the refrigerator or an object around the refrigerator, and improves user experiences.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025]

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 mounting 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 mounting box and a mounting base of FIG. 7.

FIG. 9 is a front exploded view after an inner container and a housing body are hidden.

FIG. 10 is a perspective exploded view of a mounting base and a display control assembly in a second embodiment of the present invention.

FIG. 11 is a schematic perspective diagram of FIG. 10 from another perspective.

DETAILED DESCRIPTION

[0026] 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.

[0027] Reference is made to FIGS. 1 to 11 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 1, the refrigerator further comprises a mounting box 3 provided between the inner container 1 and the housing 2, and a main control board 4 provided in the mounting box 3, and the mounting box 3 has an opening 31 opened forwards for mounting and dismounting the main control board 4.

[0028] 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.

[0029] In the present embodiment, the housing 2 has a top wall and two side walls, and the mounting box 3 is provided between the top wall and the inner container 1. On the one hand, since an area of the top wall is less than an area of the side wall, a foaming cavity 5 between the top wall and the inner container 1 can be easily thickened to prevent the mounting 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.

[0030] 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.

[0031] Certainly, in other embodiments, the mounting 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 freez-

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

[0032] In the present embodiment, the mounting box 3 is provided adjacent to an 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 a 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.

[0033] 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.

[0034] 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.

[0035] A notch 223 opened forwards is provided at a position of the housing 2 adjacent to the opening 31 of the mounting box 3, and in the present embodiment, the notch 223 is provided on the first wall 221 of the reinforcing beam 22 and is through in the up-down direction. That is, it can be understood that the notch 223 is formed by recessing a front end of the first wall 221 backwards. A part of the mounting box 3 corresponding to the notch 223 protrudes into the notch 223 and covers an inner wall of the notch 223. That is, the inner wall of the notch 223 is provided to be fitted with an outer wall of the mounting box 3. A position where the opening 31 of the mounting box 3 penetrates through the second wall 222 is communicated with the notch 223, such that an upper front end of the mounting box 3 is exposed outside.

[0036] Therefore, during repair, a repair person cannot touch the reinforcing beam 22, and even when the opening 31 of the mounting box 3 is not quite large, the repair person can only touch a plastic structure of the mounting 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 mounting box 3 may not protrude into the notch 223; that is, the outer wall of the mounting box 3 is provided to be attached to an inner wall surface of the first wall 221.

[0037] As shown in FIGS. 4 to 7, the mounting box 3 comprises an upper cover 32 and a lower cover 33 which are assembled to each other up and down, such that molding and assembly are simpler. Certainly, in other embodiments, the mounting box 3 can be integrally formed.

[0038] The refrigerator further comprises a prepositioning structure for assembling the mounting box 3 and the housing 2 to each other. The prepositioning structure is provided between the mounting box 3 and the housing 2 and located on a front side of the mounting box 3, and comprises a clamping structure 34 provided on one of the mounting box 3 and the housing 2 and a fitting structure 23 provided on the other of the mounting box 3 and the housing 2.

[0039] In the present embodiment, the fitting structure 23 is provided in a through hole of the housing 2, and the through hole penetrates through the housing body 21 and the first wall 221 of the reinforcing beam 22 in the up-down direction. The clamping structure 34 comprises a first clamping portion 341 fixed to the fitting structure 23, and a second clamping portion 342 located on a front side of the first clamping portion 341 and fixed to a front end wall of the housing 2 (i.e., a front end wall of the first wall 221 of the reinforcing beam 22). The prepositioning structure comprises a plurality of through holes provided in the transverse direction, the first clamping portion 341 and the second clamping portion 342.

[0040] The first clamping portion 341 and the second clamping portion 342 are provided on the upper cover 32, and clamping cavities of the first clamping portion 341 and the second clamping portion 342 are provided oppositely. During pre-fixation, the first clamping portion 341 is obliquely placed in the through hole from bottom to top and moved forwards, and then, the mounting box 3 is lifted and pushed backwards, such that the second clamping portion 342 is clamped on the front end wall of the housing 2 (i.e., the front end wall of the reinforcing beam 22).

[0041] By providing the first clamping portion 341 and the second clamping portion 342, on the one hand, a bearing capacity of the clamping structure 34 can be increased, and a risk of damage to the first clamping portion 341 and the second clamping portion 342 can be reduced. On the other hand, a screw fixing mode is avoided, screws penetrate through the upper cover 32 to damage the main control board 4 in the mounting box 3, and meanwhile, the repair person can be prevented from being scratched by the screws.

[0042] By providing the prepositioning structure, the mounting box 3 and the housing 2 can be fixed firstly, hole positions between the mounting box 3 and the housing 2 can be aligned, and then, fixation is further performed using screws at other positions, such that the mounting box 3 is not required to be held with the hand during fixation by the screws, thus improving an assembly efficiency.

[0043] 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.

[0044] The mounting box 3 has a passing hole 36 for providing a wire harness, and in the present embodiment, the 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 passing hole can be located on a rear side.

[0045] The mounting box 3 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.

[0046] In the present embodiment, the accommodating cavities comprise 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.

[0047] 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.

[0048] 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.

[0049] 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.

[0050] As shown in FIGS. 5 to 9, 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.

[0051] The wire passing hole 72 is located on a transverse side of the front wall of the mounting base 7, the

wire passing hole 72 and the 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 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.

[0052] 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.

[0053] The mounting base 7 further has limiting buckles 75 protruding from an inner wall of the inner mounting cavity 71, the limiting buckles 75 are oppositely provided on an upper side of the supporting portion 74, a fixing space is formed between the limiting buckles 75 and the supporting portion 74 to fix the main control board 4, and the limiting 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 limiting 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.

[0054] 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.

[0055] 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.

[0056] The mounting base 7 further comprises an outer mounting cavity 78 provided beside the inner mounting cavity 71 to accommodate the 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 surrounds left and right sides and a rear side of the inner mounting cavity 71, and is located on one side of the passing hole 36 of the mounting box 3. The outer mounting cavity 78 means a space formed by outermost side walls of the mounting base 7 in the 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.

[0057] The outer mounting cavity 78 near the 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.

[0058] 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 tidied by the wire binding portion 781, thus reducing a probability that the wire harness is separated from the wire binding portion 781.

[0059] A positioning structure for positioning the mounting base 7 and the mounting 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 mounting box 3 in the up-down direction, and a second elastic portion 721 elastically abutting against the mounting 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 mount-

ing box 3.

[0060] 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 mounting 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.

[0061] Specifically, the mounting 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 mounting box 3 and obliquely extend towards the interior of the mounting 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 mounting box 3 is large, thus facilitating mounting and dismounting; meanwhile, the large space facilitates heat dissipation.

[0062] In the present embodiment, the first abutting portion 312 and the second abutting portion 313 are provided at a rear end inside the mounting box 3, such that the movement space in the first half of the interior of the mounting 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.

[0063] 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 one side in the transverse direction.

[0064] A transverse protruding width of the second abutting portion 313 near the passing hole 36 side of the mounting box 3 is greater than a protruding width of the other second abutting portion 313, thereby ensuring that the mounting box 3 on the passing hole 36 side has a sufficient space to arrange the wire harness.

[0065] Certainly, in other embodiments, the mounting 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.

[0066] The mounting base 7 and the mounting 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.

[0067] 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.

[0068] Meanwhile, the passing hole 36 of the mounting 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.

[0069] The fixing portion 723 on the other side in the transverse direction is fitted with a protrusion 316 protruding from the mounting 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.

[0070] 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.

[0071] As shown in FIGS. 10 and 11 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.

[0072] 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.

[0073] 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.

[0074] In conclusion, in the refrigerator according to the present invention, the mounting box 3 is provided between the inner container 1 and the housing 2, the main control board 4 is provided in the mounting box 3, and the mounting box 3 has the opening 31 opened forwards for mounting and dismounting the main control board 4. Therefore, during repair, the display control assembly 6 on the front side of the mounting box 3 can be directly detached, and then, the main control board 4 is pulled out forwards, which greatly simplifies repair steps, reduces a repair time, reduces a repair cost, and meanwhile is not prone to damage to the refrigerator or an object around the refrigerator, and improves user experiences.

[0075] 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.

[0076] 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 mounting box provided between the inner container and the housing, and a main control board provided in the mounting box, and the mounting box has an opening opened forwards for mounting and dismounting the main control board.

2. The refrigerator according to claim 1, wherein the mounting box is provided adjacent to an inner wall of the housing.

3. The refrigerator according to claim 2, wherein the housing has a top wall and two side walls, the mounting box is provided between the top wall and the inner container, and the refrigerator further has a heat insulating layer provided between the housing and the inner container adjacent to the mounting box.

4. The refrigerator according to claim 3, wherein the refrigerator further comprises a prepositioning structure for assembling the mounting box and the housing to each other, the prepositioning structure is provided between the mounting box and the housing and located on a front side of the mounting box, and the prepositioning structure comprises a clamping structure provided on one of the mounting box and the housing and a fitting structure provided on the other of the mounting box and the housing.

5. The refrigerator according to claim 4, wherein the fitting structure is provided on the housing and configured as a through hole, and the clamping structure comprises a first clamping portion fixed to the fitting structure, and a second clamping portion located on a front side of the first clamping portion and fixed to a front end wall of the housing.

6. The refrigerator according to claim 3, wherein the mounting box further has supporting legs protruding downwards to be supported on the inner container.

7. The refrigerator according to claim 2, wherein a notch opened forwards is provided at a position of the housing adjacent to the opening of the mounting box, and a part of the mounting box corresponding to the notch protrudes into the notch and covers an inner wall of the notch.

8. The refrigerator according to claim 7, wherein the housing comprises a housing body and a reinforcing beam provided on a front side of the housing body,

the reinforcing beam has a first wall extending in a front-rear direction, and a second wall formed by bending from the first wall towards the inner container, and the notch and the opening correspondingly penetrate through the first wall and the second wall respectively.

9. The refrigerator according to claim 1, wherein the refrigerator further comprises a mounting base provided in the mounting box for mounting the main control board, and the mounting base has an inner mounting cavity for mounting the main control board.

10. The refrigerator according to claim 9, wherein the mounting base further has a supporting portion protruding from an inner bottom wall of the inner mounting cavity to support the main control board.

11. The refrigerator according to claim 10, wherein the mounting base further has a buckle protruding from an inner side wall of the inner mounting cavity, and the buckle is fitted with the supporting portion to fix the main control board.

12. The refrigerator according to claim 9, wherein the mounting base further has a through hole which is through in an up-down direction to expose a bottom of the main control board.

13. The refrigerator according to claim 9, wherein the mounting base further comprises an outer mounting cavity provided beside the inner mounting cavity to accommodate a wire harness, and a wire binding portion protruding from an inner wall of the outer mounting cavity.

14. The refrigerator according to claim 13, wherein the mounting box has a passing hole for providing the wire harness, the outer mounting cavity near the passing hole side has a plurality of first wiring grooves, and the side wall of the inner mounting cavity has a plurality of second wiring grooves fitted with the first wiring grooves.

15. The refrigerator according to claim 9, wherein a positioning structure for positioning the mounting base and the mounting box is further provided therebetween, the positioning structure comprises a first abutting portion and a second abutting portion protruding inwards from the mounting box and fixed to the mounting base, the first abutting portion is formed by protruding in the up-down direction, and the second abutting portion is formed by protruding in a transverse direction.

16. The refrigerator according to claim 15, wherein the mounting base has a first elastic portion and a second elastic portion which abut against the first abutting portion and the second abutting portion respectively, and the first elastic portion and the second elastic portion are arranged on a rear side of the mounting base.

17. The refrigerator according to claim 1, wherein a foaming cavity is formed between the housing and the inner container, and the mounting box has a ventilation hole for communicating the foaming cavity with the interior of the mounting box.

18. The refrigerator according to claim 17, wherein the refrigerator further comprises a breathable film provided at the ventilation hole on an outer side of the mounting box.

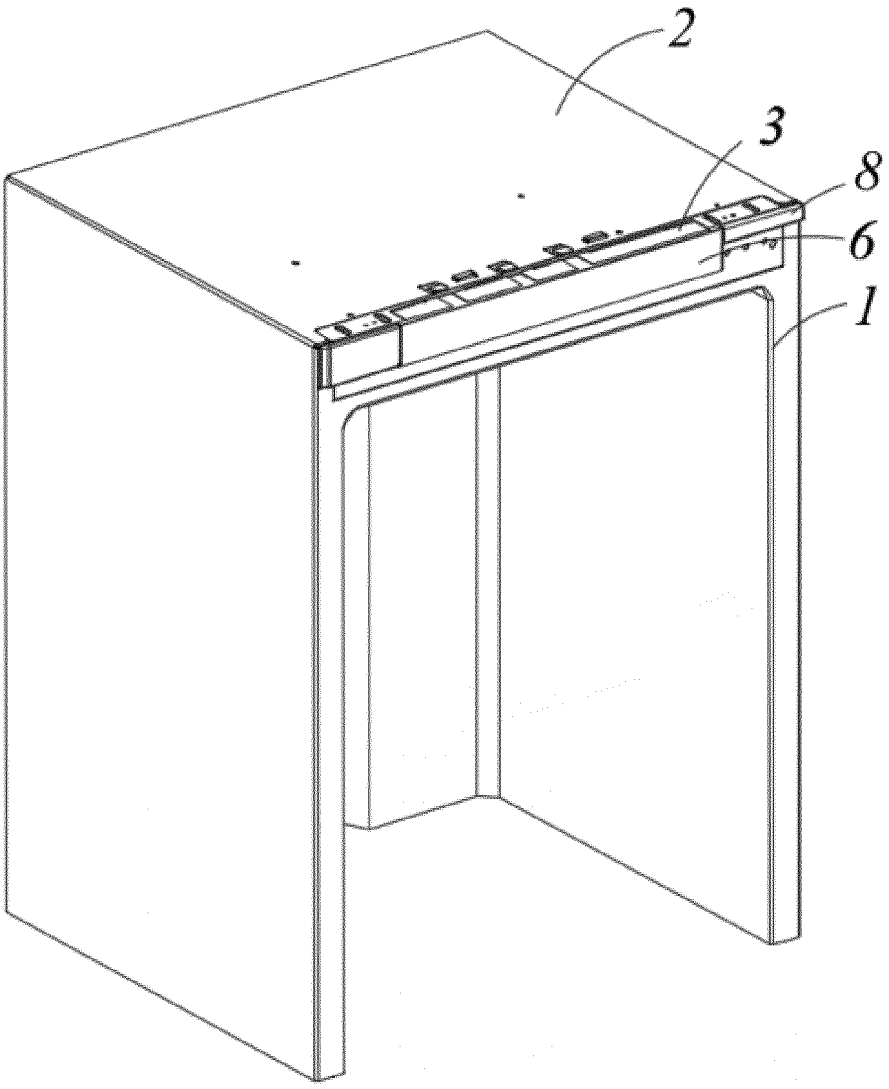


FIG.1

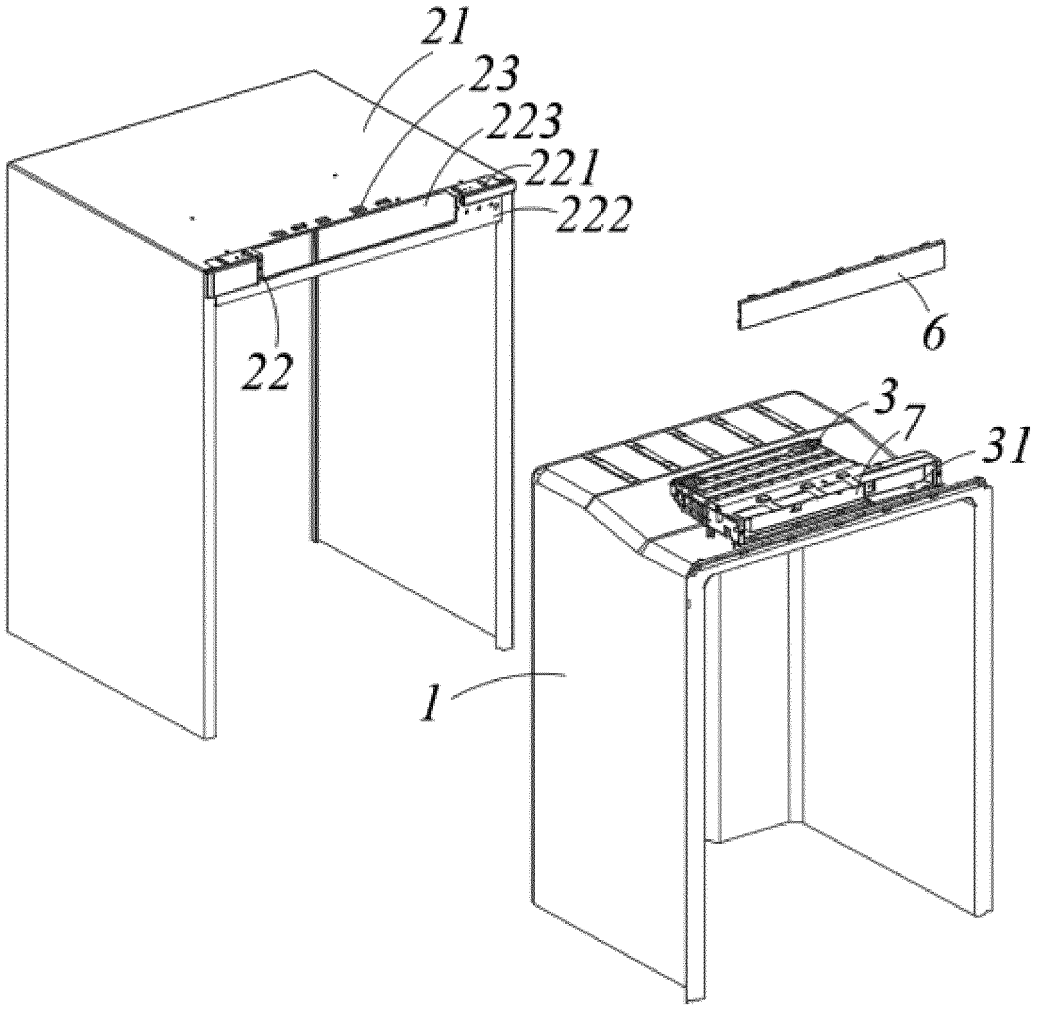


FIG.2

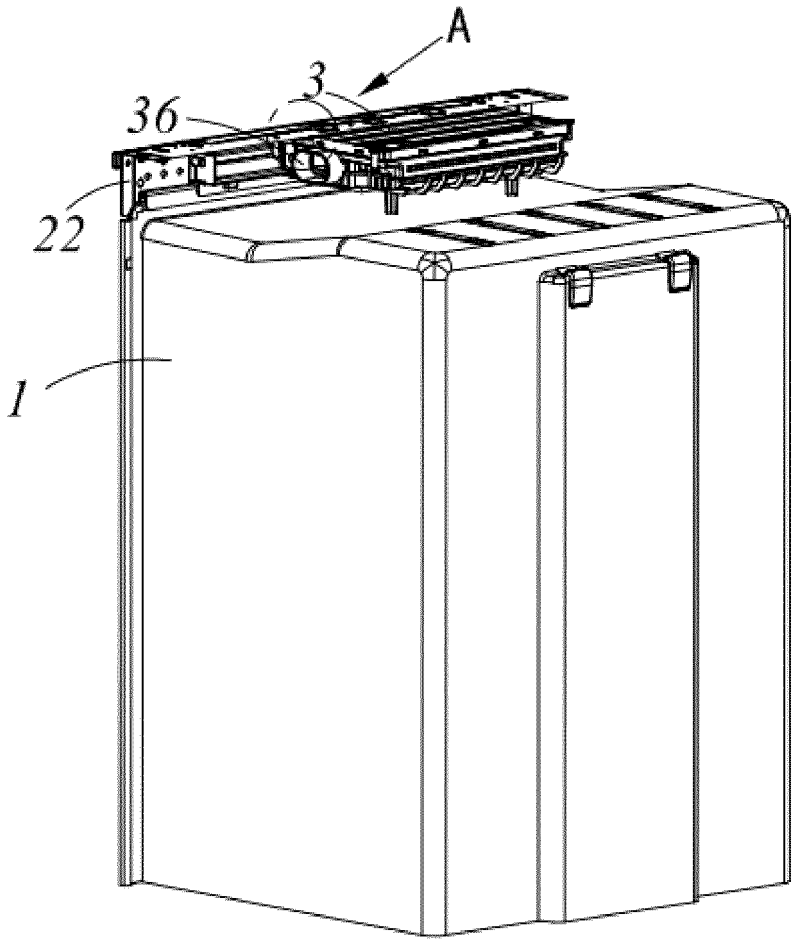


FIG.3

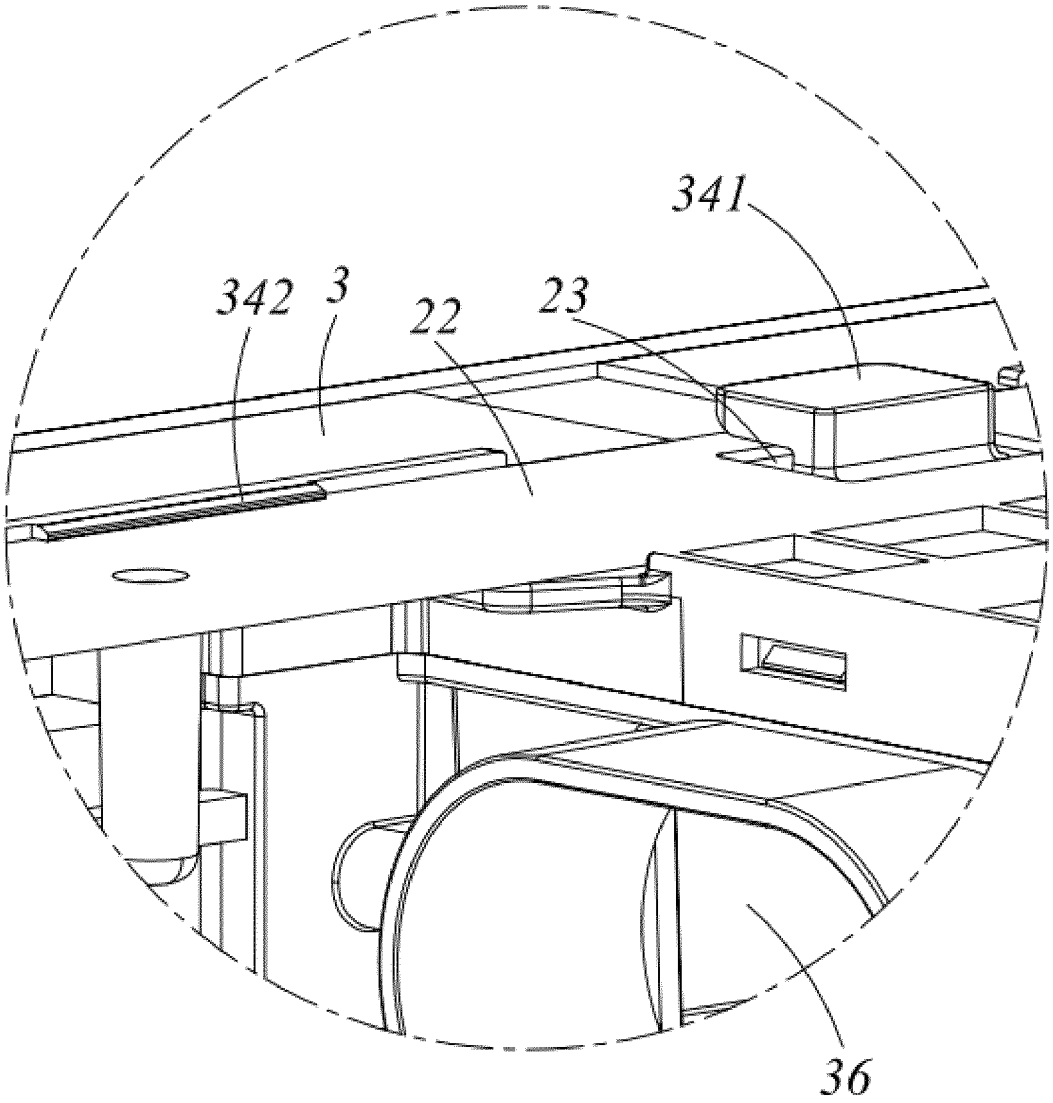
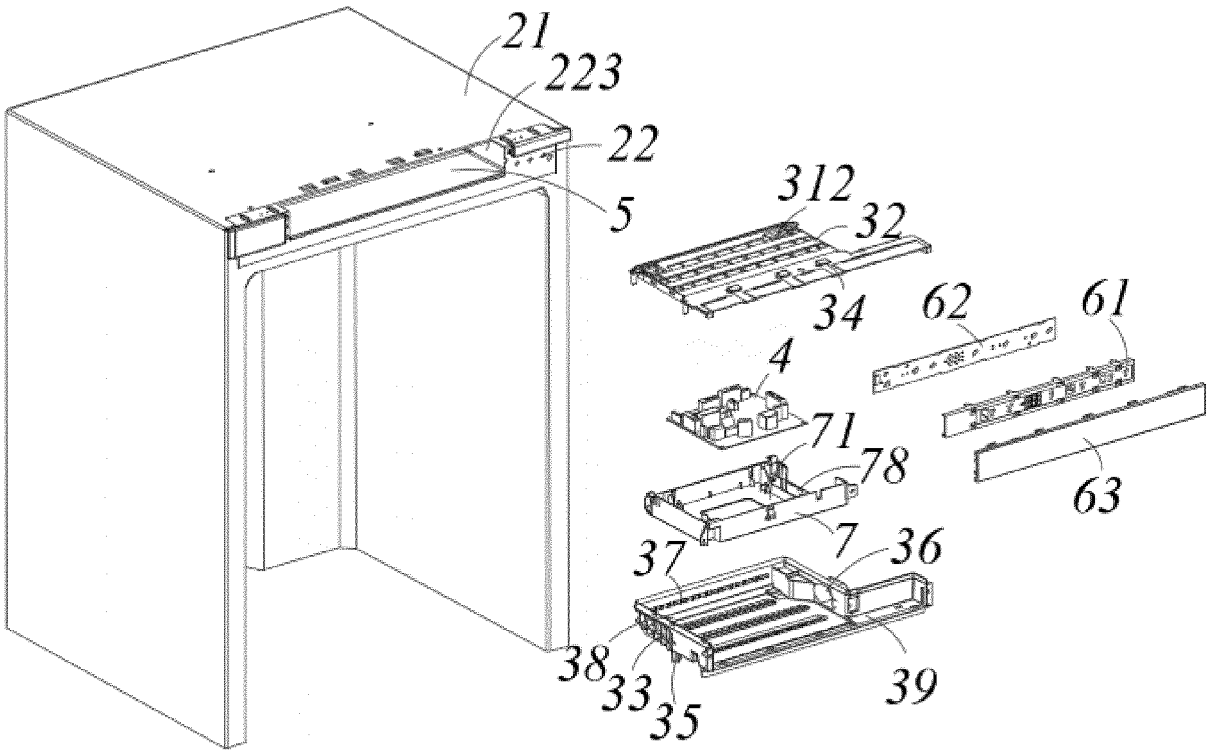


FIG.4



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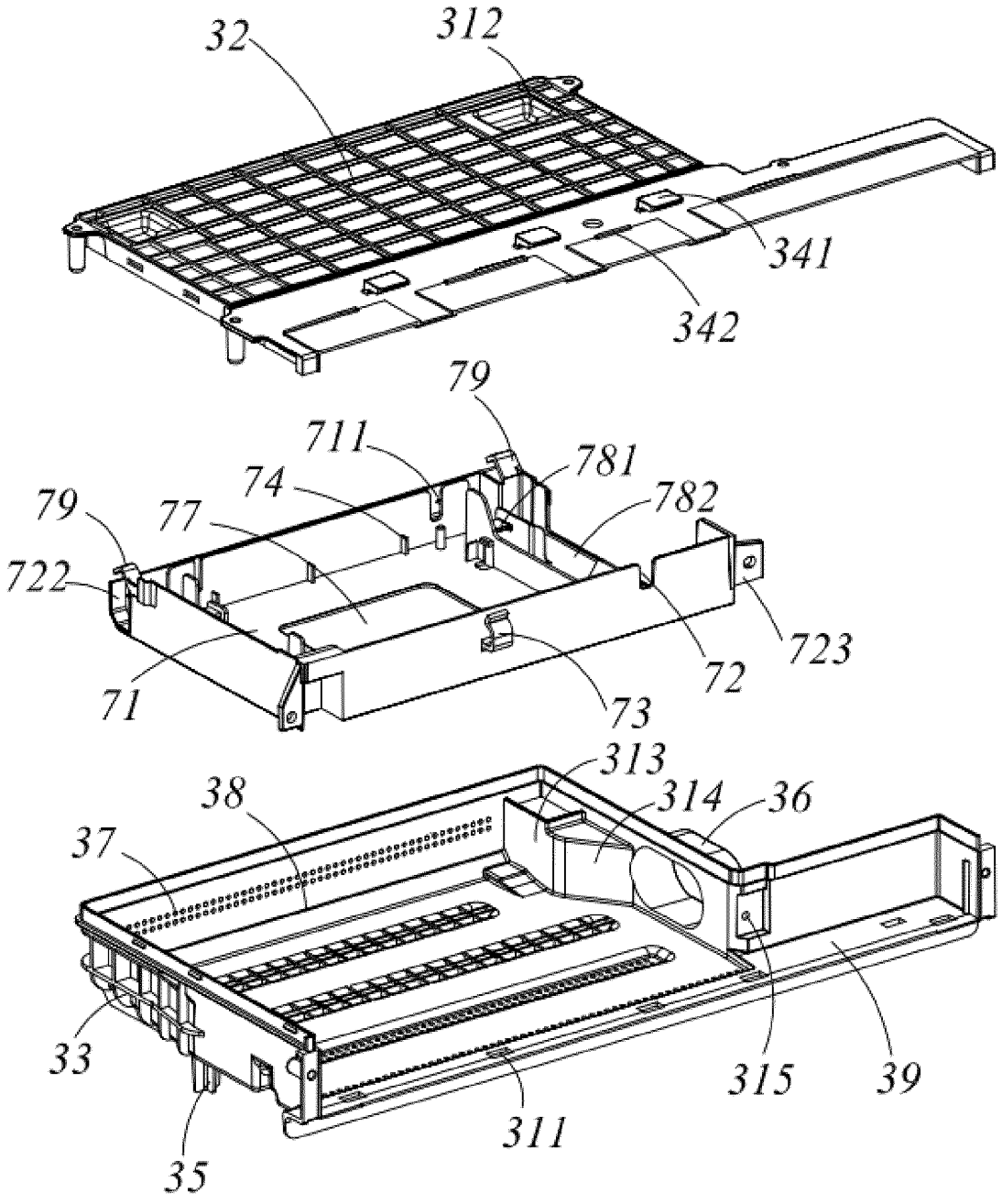
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FIG.6

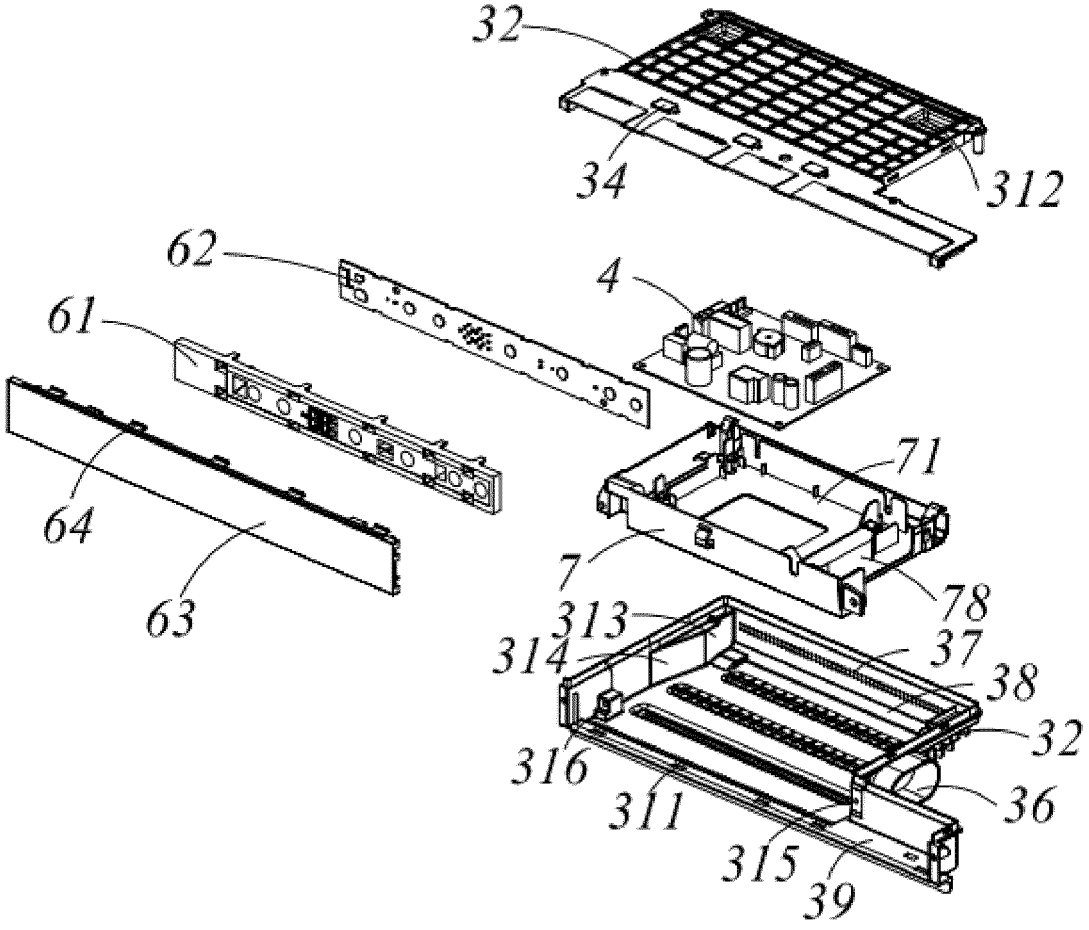

FIG.7

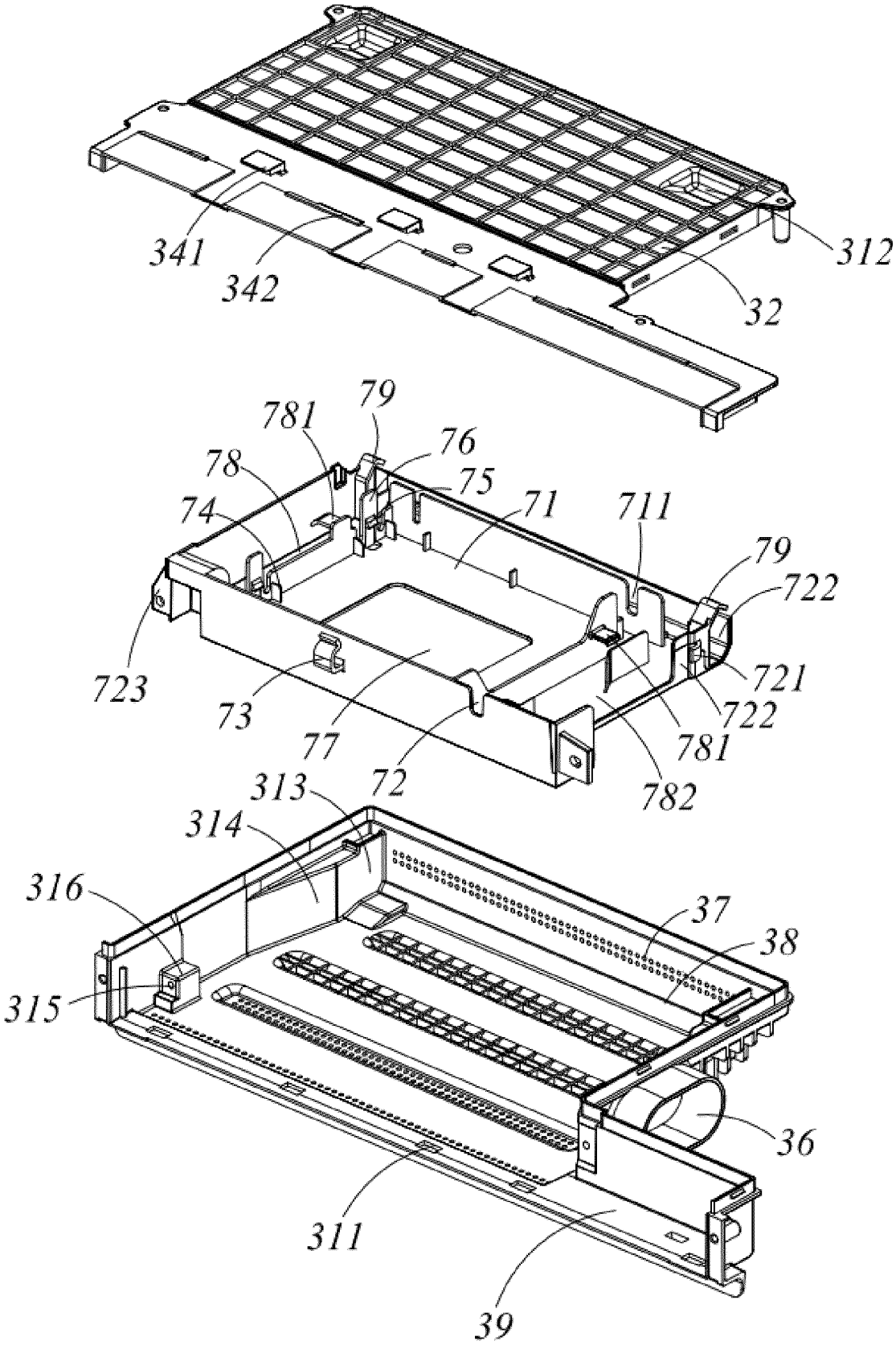
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FIG.8

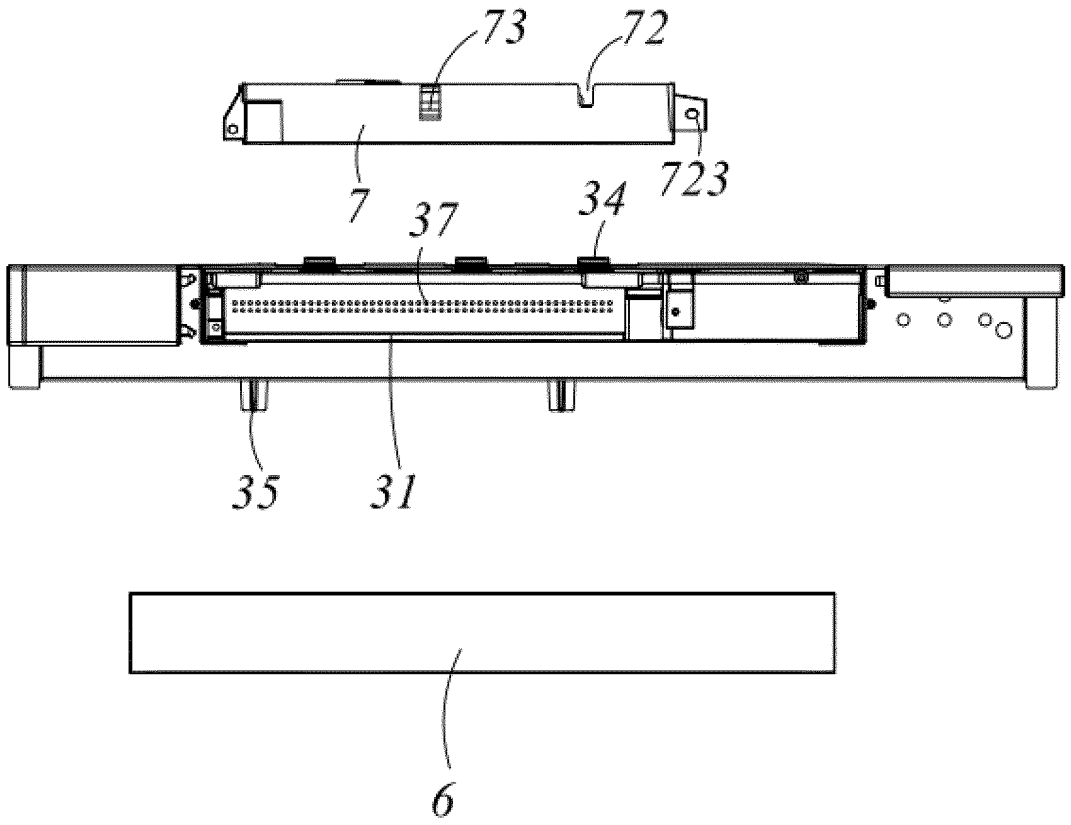

FIG.9

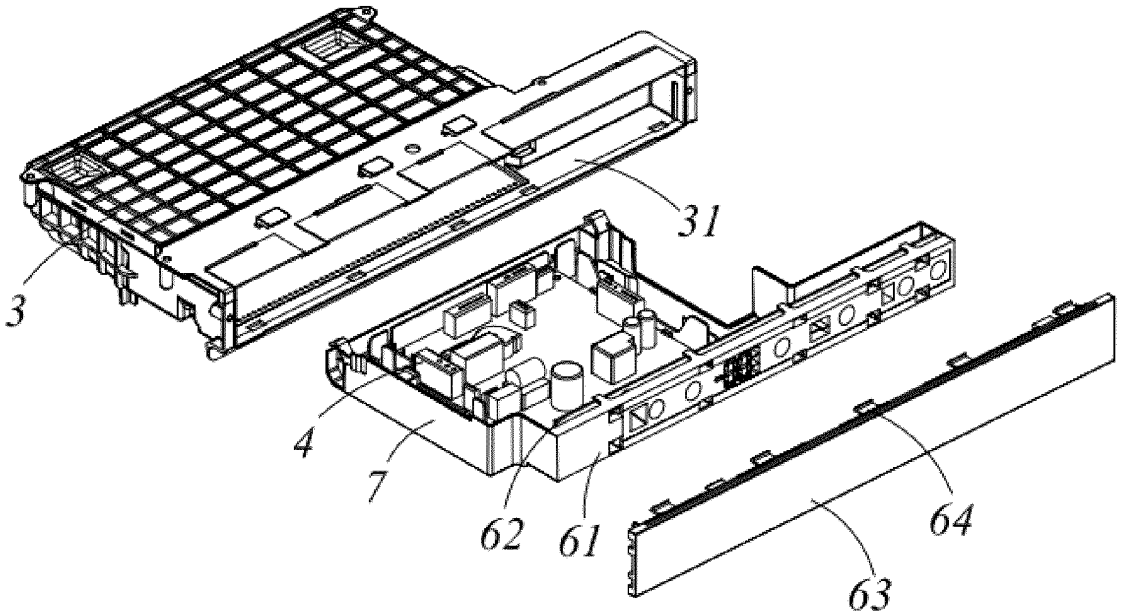

FIG.10

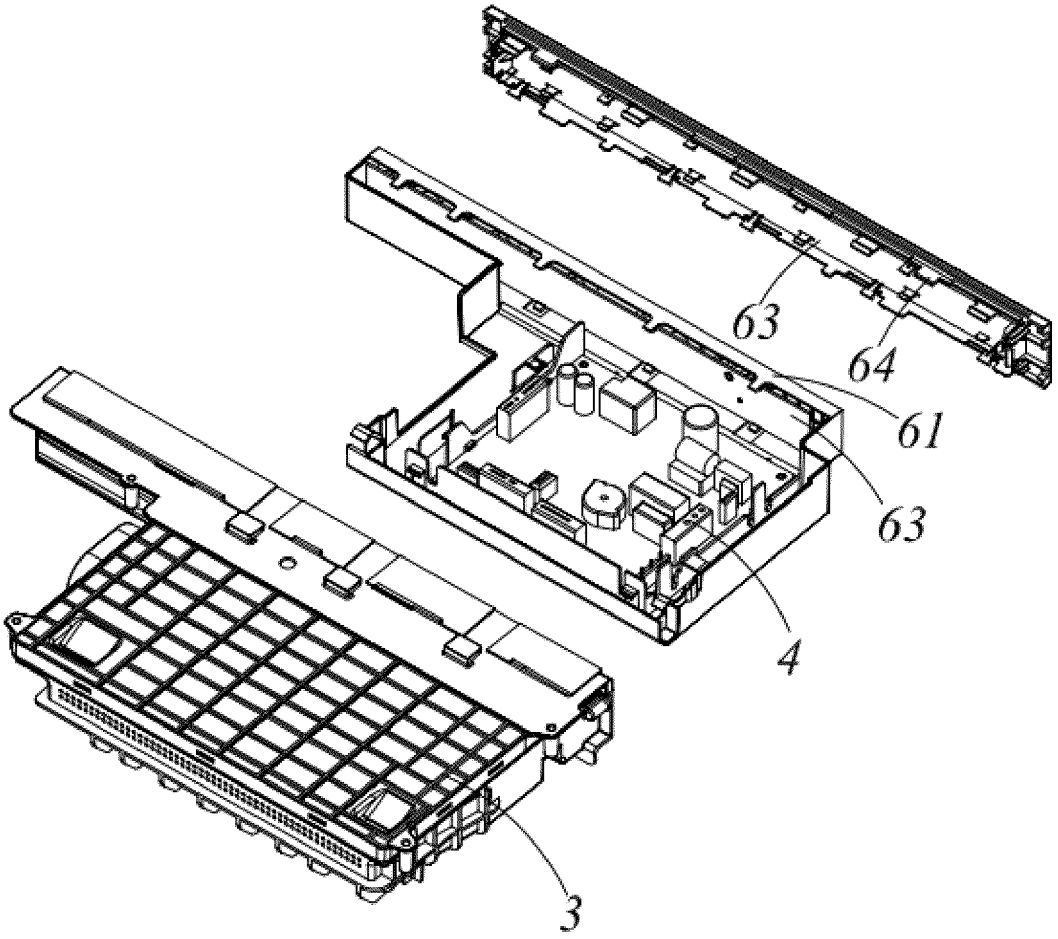

FIG.11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/135914

A. CLASSIFICATION OF SUBJECT MATTER

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

F25D

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)

CNTXT; CNABS; CNKI; DWPI; VEN: 嵌入式, 冰箱, 内胆, 安装盒, 主控板, 向前, 朝前, 开口, 安装座, built-in, refrigerator, liner, box, assemble, mounting, control, board, panel, front, opening, base

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 214537039 U (QINGDAO HAIER REFRIGERATOR CO., LTD. et al.) 29 October 2021 (2021-10-29) description, specific embodiments and figures	1-18
PX	CN 214537040 U (QINGDAO HAIER REFRIGERATOR CO., LTD. et al.) 29 October 2021 (2021-10-29) description, specific embodiments and figures	1-18
X	CN 111649517 A (HISENSE RONSHEN (GUANGDONG) REFRIGERATORS CO., LTD.) 11 September 2020 (2020-09-11) description, paragraphs [0041]-[0057], and figures 1-9	1-8
A	CN 210688881 U (HEFEI MEIKE REFRIGERATION TECHNOLOGY CO., LTD.) 05 June 2020 (2020-06-05) entire document	1-18
A	CN 206572845 U (HOMA APPLIANCES CO., LTD.) 20 October 2017 (2017-10-20) entire document	1-18
A	CN 207674803 U (QINGDAO HAIER CO., LTD.) 31 July 2018 (2018-07-31) entire document	1-18

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

* Special categories of cited documents:
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"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)
"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
"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
"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
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 February 2022	**03 March 2022**
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** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/135914

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A	CN 203274413 U (HEFEI HUALING CO., LTD.) 06 November 2013 (2013-11-06) entire document	1-18
A	CN 108173187 A (HEFEI HUALING CO., LTD. et al.) 15 June 2018 (2018-06-15) entire document	1-18
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Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2021/135914

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CN 214537039 U	29 October 2021	None	
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CN 111649517 A	11 September 2020	None	
CN 210688881 U	05 June 2020	None	
CN 206572845 U	20 October 2017	None	
CN 207674803 U	31 July 2018	None	
CN 102937368 A	20 February 2013	None	
CN 203274413 U	06 November 2013	None	
CN 108173187 A	15 June 2018	None	
CN 1548896 A	24 November 2004	None	

Form PCT/ISA/210 (patent family annex) (January 2015)