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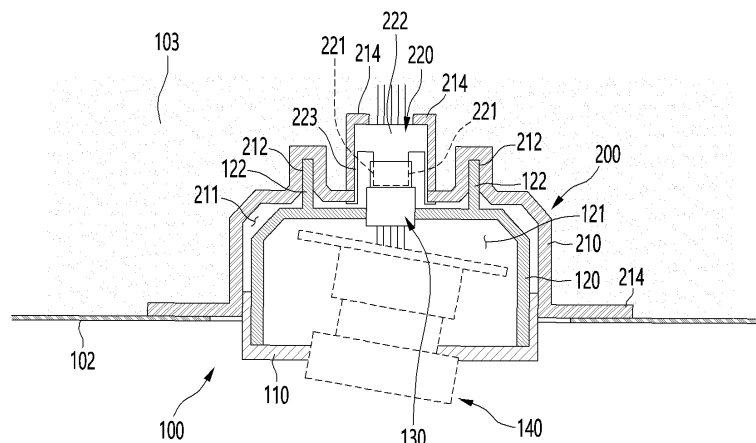
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(54) **REFRIGERATOR**

(57) A refrigerator according to an embodiment of the present invention comprises: a cabinet which forms a storage space; a door which opens/closes the storage space; an accommodation member which is provided in the storage space; and a device which is detachably mounted to the accommodation member and performs additional functions in a connected state, wherein: the

accommodation member includes a first connection part which is connected to a control unit for controlling the device; the device includes a second connection part; and when the device is mounted, the first connection part and the second connection part are connected to each other so that power can be supplied to the device and signals can be delivered from/to the control unit.

Figure 4



Description

Technical Field

[0001] The present disclosure relates to a refrigerator.

Background Art

[0002] In general, a refrigerator is a home appliance that allows food to be stored at low temperatures in an internal storage space that is shielded by a door. To this end, the refrigerator is configured to cool the inside of the storage space by using cold air generated through heat exchange with a refrigerant that circulates a refrigeration cycle, thereby allowing the stored food to be stored in an optimal condition.

[0003] Recently, refrigerators are becoming larger and more multifunctional in line with the changing eating habits and the trend toward more sophisticated products, and refrigerators equipped with various structures and convenient devices for the convenience of users and efficient use of internal space are being released.

[0004] For example, a deodorizing device for removing odors inside the refrigerator may be mounted inside the refrigerator. In addition, a camera may be mounted inside the refrigerator to check the food inside the refrigerator. In addition, various sensors may be provided to check the storage state of food stored inside the refrigerator.

[0005] Korean Patent Publication No. 10-2016-0089725 discloses a refrigerator that has a camera installed on the upper surface of the inner side of the refrigerator to photograph the space inside the refrigerator.

[0006] However, in refrigerators with this type of structure, there is a problem in that the camera is fixedly mounted on the refrigerator, so the camera cannot be placed in a desired location. In addition, there is a problem in that the camera is placed even when it is not necessary, which increases the product price, and there is a problem in that a diverse product lineup cannot be composed.

Disclosure

Technical Problem

[0007] An object of an embodiment of the present disclosure is to provide a refrigerator in which a user can additionally mount a desired device.

[0008] An object of an embodiment of the present disclosure is to provide a refrigerator in which a user can additionally mount devices at various locations within the refrigerator.

[0009] An object of an embodiment of the present disclosure is to provide a refrigerator whose performance can be upgraded through selective mounting of a device in a user's refrigerator.

Technical Solution

[0010] A refrigerator according to an embodiment of the present disclosure includes a cabinet forming a storage space; a door opening and closing the storage space; an accommodation member provided in the storage space; and a device detachably mounted on the accommodation member and performing an additional function in a connected state, in which the accommodation member may be provided with a first connection part connected to a control part for controlling the device, the device may be provided with a second connection part, and when the device is mounted, the first connection part and the second connection part may be connected to each other so as to supply power to the device and transmit signals to the control part.

[0011] The cabinet may include an outer case forming an outer appearance; an inner case forming the storage space; and an insulation material filled between the outer case and the inner case, and in which the accommodation member may be provided in the inner case and is embedded by the insulation material.

[0012] The accommodation member may form a recessed space to accommodate at least a part of the device, and the space may be recessed into the wall surface of the storage space.

[0013] An insulation member which is in contact with the insulation member and has a higher insulation coefficient than the insulation member MAY BE disposed on the outer surface of the accommodation member.

[0014] The first connection part may be provided in the space and protrudes toward the direction into which the device is inserted.

[0015] The accommodation member may include a case forming a space in which the device is received, and the first connection part may be provided at a position facing the second connection part and may be connected to the second connection part during the mounting process of the device.

[0016] A fitting part may be formed which is formed in a shape corresponding to each other around the case and the device, and when the device is mounted, comes into contact with each other to have a directionality.

[0017] The refrigerator may further include a guide projection protruding from the device and extending in the same direction as the second connection part; and a guide part recessed into the case facing the guide projection and formed on the same surface as the first connection part, in which while the guide projection is inserted into the guide part, the coupling the first connection part and the second connection part may be guided.

[0018] The guide protrusion may be formed symmetrically with respect to the second connection part.

[0019] The guide projection may be formed to protrude further than the second connection part.

[0020] The device may include a module connected to the second connection part and for driving the device, a

main body accommodating the module and through which the second connection part is exposed; and a device cover shielding the space and is exposed to the storage space.

[0021] The refrigerator may further include a cover detachably mounted on the accommodation member and shielding the first connection part when the device is not mounted.

[0022] The cover may form a part of the wall surface of the storage space while being mounted on the accommodation member.

[0023] A plurality of the accommodation members may be provided in the storage space, and the device may be mounted in at least one of the plurality of accommodation members.

[0024] The first connection part and the second connection part may be configured as USB terminals.

[0025] The control part may be configured to recognize the type of the device, and a corresponding program for driving the recognized device may be stored.

[0026] The device may be exposed to the inside of the storage space while mounted on the accommodation member.

[0027] The accommodation member may be provided in a door liner forming the rear surface of the door.

[0028] The refrigerator may further include a filler shielding between a pair of doors disposed in parallel, in which the accommodation member may be provided in the filler.

Advantageous Effect

[0029] The following effects can be expected from a refrigerator according to an embodiment of the proposed disclosure.

[0030] In a refrigerator according to an embodiment of the present disclosure, a device having a desired function can be selectively additionally mounted inside the storage space according to the user's needs. Accordingly, there is an advantage in that a product that meets the user's preference can be provided by allowing the user to add a desired function to a refrigerator having basic functions after it is sold.

[0031] In addition, additional functions or upgraded functions can be provided through the device even after the sale of the refrigerator, and users have the advantage of being able to improve the performance of the product by mounting the device without replacing the entire refrigerator system.

[0032] In addition, by disposing a plurality of accommodation members so that they can be mounted in various locations according to the type or number of the devices, there is an advantage in that various devices can be selectively mounted in desired locations according to the user's needs.

[0033] In addition, when mounting of the device is not required, the outer appearance of the storage space can be prevented from being disturbed by shielding the ac-

commodation member through the cover, and there is also an advantage in that the connection part of the accommodation member can be prevented from being contaminated or causing safety problems.

[0034] In addition, the device can be connected to the accommodation member by the first connection part and the second connection part so that power and signal transmission can be enabled, thereby facilitating installation of the device. In particular, the first connection part and the second connection part can have a standardized terminal structure so that various types of the device can have the same connecting structure, thereby allowing the device to have the same connecting structure regardless of the type of the device.

[0035] In addition, the device and the accommodation member are formed with a guide projection and a guide part so that the first connection part and the second connection part can be connected without a separate operation during the process of mounting the device on the accommodation member, thereby making mounting of the device easier. In addition, there is an advantage in that incorrect assembly of the device is prevented and mounting of the device is possible with accurate placement by the guide projection and the guide part.

Description of Drawings

[0036]

FIG. 1 is a perspective view illustrating a refrigerator of an embodiment of the present disclosure.

FIG. 2 is a partial perspective view illustrating a state where a door of the refrigerator is open.

FIG. 3 is a view illustrating a state where the device is not mounted in FIG. 2.

FIG. 4 is a cross-sectional view illustrating a state where a device is mounted according to an embodiment of the present disclosure.

FIG. 5 is a schematic view illustrating the coupled structure of an accommodation member and a device that are coupled to each other.

FIG. 6 is a cross-sectional view illustrating a state where the device is separated.

FIG. 7 is a cross-sectional view taken along line VII-VII' of FIG. 2.

FIG. 8 is an exploded perspective view illustrating the device.

FIG. 9 is a cross-sectional view taken along line IX-IX' of FIG. 3.

FIG. 10 is a perspective view illustrating a cover of an embodiment of the present disclosure.

FIG. 11 is a block diagram schematically illustrating the connection state of the main components of the refrigerator.

FIG. 12 is a flowchart sequentially illustrating the operation of the refrigerator according to the mounting of the device.

FIG. 13 is a partial perspective view illustrating the

mounting state of the device according to another embodiment of the present disclosure.

Fig. 14 is a partial perspective view illustrating the mounting state of the device according to another embodiment of the present disclosure.

Best Mode

[0037] Hereinafter, specific embodiments of the present disclosure will be described in detail with reference to the drawings. However, the present disclosure is not limited to the embodiments in which the idea of the present disclosure is presented, and other regressive disclosures or other embodiments included within the scope of the idea of the present disclosure can be easily proposed by adding, changing, deleting, or the like other components.

[0038] Before the explanation, the direction is defined. In the embodiment of the present disclosure, the direction in which the front surface of the door illustrated in FIG. 1 is facing may be defined to as a front direction, the direction toward the cabinet may be defined to as a rear direction based on the front surface of the door, the direction facing the floor where the refrigerator is installed may be defined to as a lower direction, and the direction away from the floor may be defined to as an upper direction.

[0039] FIG. 1 is a perspective view illustrating a refrigerator according to an embodiment of the present disclosure.

[0040] As illustrated in the drawing, a refrigerator 1 according to an embodiment of the present disclosure may have an outer appearance formed by a cabinet 10 forming a storage space and a door 20 for opening and closing the storage space.

[0041] The storage space inside the cabinet 10 can be partitioned vertically by partition walls 11, and a refrigerating compartment 12 can be formed in the upper part of the cabinet 10 and a freezing compartment 13 can be formed in the lower part of the cabinet 10.

[0042] In addition, a control part 14 for controlling the overall operation of the refrigerator 1 may be formed on the upper surface of the cabinet 10. The control part 14 may control the operation of the refrigerator 1 as well as the operation of the device 100 to be described below. In addition, an output part 141 is connected to the control part 14 to output the operation state of the refrigerator. The output part 141 may include a display that displays information on a screen or a speaker that displays information in voice. In addition, a manipulation part 17 is connected to the control part 14 to input a manipulation for the operation of the refrigerator 1. In addition to a physical input method such as a button, a switch, or a touch, the manipulation part 17 may include a microphone capable of inputting voice.

[0043] In the embodiment of the present disclosure, the control part 14 is described as being placed on the upper surface of the cabinet 10, but the control part 14 may be provided at various locations in the refrigerator 1,

and a plurality of control parts may be provided and placed at different locations, respectively.

[0044] The door 20 may be composed of a refrigerating compartment door 21 and a freezing compartment door 22. The refrigerating compartment door 21 may be configured to open and close the open front surface of the refrigerating compartment 12 by rotating, and the freezing compartment door 22 may be configured to open and close the open front surface of the freezing compartment 13 by rotating. Meanwhile, the refrigerating compartment door 21 may be called an upper door because it is provided at the top, and the freezing compartment door 22 may be called a lower door because it is provided at the bottom.

[0045] In addition, a pair of the refrigerating compartment doors 21 may be provided in the left and right direction so that the refrigerating compartment 12 may be shielded by the pair of doors 21. In addition, a pair of freezing compartment doors 22 may be provided in the left and right direction so that the freezing compartment 13 may be opened and closed by the pair of doors. Of course, the freezing compartment door 22 may be configured to be capable of pulling out in a drawer-like manner as needed, and may be configured with one or more doors.

[0046] In the embodiment of the present disclosure, a refrigerator is described as an example in which a bottom freeze type refrigerator with a freezing compartment 13 provided at the bottom is applied with a French type door in which a pair of doors rotate to open and close each space, but the present disclosure can be applied to all types of refrigerators in which a camera module can be installed regardless of the shape of the refrigerator.

[0047] Meanwhile, at least one door 21 of the pair of refrigerating compartment doors 21 may be composed of a main door 40 and a sub door 30. The main door 40 is rotatably mounted on the cabinet 10 and may open and close the refrigerating compartment 12. In addition, an opening 41 (in FIG. 2) may be formed through the main door 40.

[0048] The sub-door 30 is provided in front of the main door 40 and can be rotatably mounted on the main door 40. In addition, the sub-door 30 can open and close the opening 41. In addition, a viewing part 31 that can view the inside of the opening 41 can be formed on the sub-door 30. The viewing part 31 can be composed of at least one transparent panel and can be selectively configured so that the inside of the opening 41 is visible. In addition, if necessary, the viewing part 31 can be composed of a display device such as an LCD capable of screen output or a transparent LCD.

[0049] Below, the structure inside the storage space of the refrigerator 1 will be examined with reference to the drawings.

[0050] FIG. 2 is a partial perspective view illustrating a state where a door of the refrigerator is open, and FIG. 3 is a view illustrating a state where the device is not mounted in FIG. 2.

[0051] As illustrated in the drawing, the cabinet 10 may include an inner case 102 forming an inner surface of the storage space, and an outer case 101 that is coupled with the inner case 102 and forming an outer appearance of the cabinet 10. In addition, an insulation material 103 formed by injecting a foaming agent may be filled between the inner case 102 and the outer case 101.

[0052] In the outer case 101 is formed of a metal material to form the outer shape of the cabinet 10, and in the inner case 102 is formed by vacuum forming with a relatively thin plastic material to form the inner shape of the storage space.

[0053] In the inner case 102 may form the upper and lower surfaces, left and right sides of the refrigerating compartment 12. In addition, if necessary, in inner case 102 may form at least a part of the rear surface of the refrigerating compartment 12. In addition, the rear surface of the refrigerating compartment 12 may be formed by the grill fan assembly 121. The grill fan assembly 121 may form a flow path for the flow of cold air inside the refrigerator.

[0054] Meanwhile, a device 100 may be mounted to the inner case 102. The device 100 may be selectively mounted on the refrigerator 1 to upgrade the function of the refrigerator 1 or provide an additional function. In addition, the device 100 may have an independent function added to the general cooling operation of the refrigerator 1. The device 100 may be referred to as a module device, a device module, a module device, an accessory, an additional device, or the like.

[0055] In order to mount the device 100, an accommodation member 200 is formed on the inner case 102, and the accommodation member 200 can be configured to allow a user to selectively mount the device 100. At this time, the accommodation member 200 is configured to enable power supply and signal processing when the device 100 is mounted, and can be configured to automatically recognize and operate when the device 100 is mounted.

[0056] Meanwhile, at least one of the accommodation members 200 may be provided inside the refrigerating compartment 12. Accordingly, the user may mount the device 100 in an appropriate location according to the type and function of the device 100.

[0057] For example, the accommodation member 200 may be provided on at least one of the upper surface and the left and right sides of the inner case 102. In addition to the inner case 102, the accommodation member 200 may also be placed in the component in the refrigerator such as the grill fan assembly 121. In addition, when the device 100 is not mounted on the accommodation member 200, a cover 190 may be mounted to shield the space formed by the accommodation member 200.

[0058] Meanwhile, looking at an example in which the device 100 is mounted with reference to FIG. 2, the device 100 may be provided at the center of the upper surface of the inner case 102. For example, the device 100 may be a camera device. Accordingly, the device 100

may photograph the inside of the storage space, i.e., the refrigerating compartment 12.

[0059] In addition to the camera device, the device 100 may use various devices such as a thermal imaging camera, an ion deodorizer, a carbon dioxide detector, a gas sensor, a reader for recognizing barcodes or QR codes, an additional cooling device composed of a thermoelectric element, a Wi-Fi dongle, or the like.

[0060] The device 100 may not be provided when purchasing a refrigerator 1, and may be additionally purchased by the user as needed, or may be additionally provided to upgrade the performance of the refrigerator 1.

[0061] The device 100 can be electrically connected to the controller 14, and thus the photographed image can be transmitted to the controller 14 and output on the display device or a remote device such as a mobile phone or PC. In addition, the image information acquired from the device 100 can be utilized as information for the operation of the refrigerator 1 through processing, or can be transmitted to the user.

[0062] In addition, the accommodation member 200 may be formed to have a sufficient size to enable mounting of various devices (100). In addition, as illustrated in FIG. 3, when the device 100 is not used, a cover may be mounted on the accommodation member 200 to shield the accommodation member 200. The cover 190 may be formed to have the same color or texture as the inner case 102, and may have a sense of unity with the inner case 102 when mounted on the accommodation member 200. In addition, the cover 190 may be formed so that the outer surface of the cover 190 is positioned on the same plane as the inner case 102 when mounted on the accommodation member 200.

[0063] In this way, the user can mount the device 100 in a suitable location among a plurality of accommodation members 200, and a cover 190 is mounted on an accommodation member 200 in which the device 100 is not mounted so that the interior of the accommodation member 200 is not exposed.

[0064] Below, the structure of the accommodation member and device will be examined in more detail with reference to the drawings.

[0065] FIG. 4 is a cross-sectional view illustrating a state where a device is mounted according to an embodiment of the present disclosure, FIG. 5 is a schematic view illustrating the coupled structure of an accommodation member and a device that are coupled to each other, and FIG. 6 is a cross-sectional view illustrating a state where the device is separated.

[0066] As illustrated, the accommodation member 200 can be mounted on the additional function performing part 102 in an inner connection state. The accommodation member 200 can be mounted so as to be exposed through an opening formed in the additional function performing part 102 in an inner connection state, and a portion of the accommodation member 200 can be embedded in the insulation material 103 so that the mount-

ing position can be firmly fixed.

[0067] The accommodation member 200 may include an case 210 that forms a recessed mounting space 211 in which the device 100 can be mounted. In addition, the case 210 may be opened toward the refrigerating compartment 12. A bent edge 214 may be formed around the circumference of the opened surface of the case 210. In addition, the edge 214 may be coupled with the inner case 102 to fix the accommodation member 200 and prevent leakage of the insulation material 103.

[0068] The mounting space 211 can form a space in which the main body 120 of the device 100 is accommodated. In addition, the mounting space 211 can be formed in a shape corresponding to the main body 120.

[0069] For example, as illustrated in (a) of Fig. 5, an additional function performing fitting part 213 in a connected state may be formed around the inner side of the case 210 in the connected state. The case fitting part 213 may be formed in a shape in which a part of the mounting space 211 is cut out.

[0070] In addition, as illustrated in (b) of Fig. 5, a main body-fitting part 123 may be formed around the outer surface of the main body 120. The main body-fitting part 123 may be formed at a position corresponding to the case fitting part 213.

[0071] Therefore, when the device 100 is mounted on the accommodation member 200, the main body 120 is inserted into the inside of the case 210, and at this time, the case fitting part 213 and the main body fitting part 123 can be mounted in a form in which they come into contact with each other. In other words, the device 100 can be mounted on the accommodation member 200 with directionality, and therefore, the device 100 can be mounted in an accurate disposition without being incorrectly mounted. In addition, the first connection part 220 of the accommodation member 200 and the second connection part 130 of the device 100 can be accurately connected by this mounting structure.

[0072] A mounting part 214 having the first connection part 220 may be formed on the inner surface of the case 210. The mounting part 214 may be further recessed into the mounting space 211, and the first connection part 220 may be mounted therein.

[0073] The mounting part 214 may extend in a direction opposite to the opening of the case 210, and may be configured such that the end thereof is bent to support the end part of the first connection part 220. Accordingly, even if the first connection part 220 is pressed when the device 100 is mounted, the first connection part 220 may be prevented from being separated. In addition, the mounting part 214 may communicate with the mounting space 211, and therefore, when an abnormality occurs in the first connection part 220, the first connection part 220 may be separated from the mounting part.

[0074] Meanwhile, the first connection part 220 may include a first body 222 that is fixed to the mounting part 214 and a first terminal 221 provided on the first body 222.

[0075] The first body 222 may be formed in a shape

corresponding to the mounting part 214 so that it can be inserted and fixed inside the mounting part 214. In addition, a body coupling part 223 may be formed at an end part of the first body 222 to be coupled with the opened circumference of the mounting part 214. In addition, the first body 222 may be formed in a recessed shape so that the second connection part 130 may be inserted.

[0076] The first terminal 221 is formed in the recessed center of the first body 222 and can protrude in the insertion direction of the second connection part 130. In addition, it can be electrically connected to the second terminal 131 of the second connection part 130 by coming into contact with each other. The first terminal 221 and the second terminal 131 can be formed in a male-female structure and connected to each other. For example, the first terminal 221 and the second terminal 131 can be formed like a standardized USB terminal structure. In addition, the first terminal 221 and the second terminal 131 can have another standardized terminal structure that can be electrically connected to each other.

[0077] A guide part 212 that guides the mounting of the device 100 may be formed on the accommodation member 200. The guide part 212 may be formed on one side of the case 210 that is the same as the surface on which the mounting part 214 is formed. In other words, the guide part 212 may be formed on the case 210, and the guide part 212 may be formed on both sides based on the mounting part 214.

[0078] The guide part 212 may be formed in a groove shape into which a guide projection 122 protruding from the device 100 is inserted. The guide part 212 may be formed in a size and shape corresponding to the guide projection 122. Accordingly, when the device 100 is mounted on the accommodation member 200, the guide projection 122 may be inserted into the guide part 212. In addition, when the guide projection 122 is inserted into the guide part 212, the mounting position of the device 100 may be guided, and the first connection part 220 and the second connection part 130 may be naturally coupled. In other words, when the device 100 is mounted so that the guide protrusion 122 is inserted into the guide part 212, the first connection part 220 and the second connection part 130 are connected to each other, so that the device 100 can be in an operable state. At this time, the guide protrusion 122 and the guide part 212 may be interlocked or pressed into each other, and the device 100 may be maintained in a state where it is mounted on the accommodation member 200.

[0079] The device 100 may include a main body 120 accommodated in the mounting space 211 and a device cover 110 that shields the mounting space 211.

[0080] The main body 120 may be formed in a shape corresponding to the mounting space 211 of the accommodation member 200. In addition, a main body fitting part 123 may be formed on one side of the circumference of the main body 120. The main body fitting part 123 may be formed in a shape corresponding to a position facing the case fitting part 213. Therefore, in the process of

inserting the main body 120 into the mounting space 211, the device 100 may be mounted while the mounting position is aligned.

[0081] An accommodation space 121 may be formed inside the main body 120 to accommodate a module 140 for the operation of the device 100. For example, if the device 100 is a camera device, the module 140 may be a camera module. The module 140 may include a substrate and may be placed inside the main body 120. In addition, the module 140 may be electrically connected to the second connection part.

[0082] The second connection part 130 may protrude from the main body 120 and may be formed at a position facing the first connection part 220. The second connection part 130 may include a second terminal 131. The second terminal 131 may be formed to accommodate the first terminal 221, and when the first connection part 220 and the second connection part 130 are coupled, the first terminal 221 and the second terminal 131 may be in contact with each other and electrically connected. In other words, power for the operation of the device 100 may be supplied through the connection between the first terminal 221 and the second terminal 131. In addition, the device 100 and the control part 14 can be connected to enable transmission of a signal through the connection between the first terminal 221 and the second terminal 131. Accordingly, the device 100 can perform a set operation and transmit information generated by the operation to the control part 14.

[0083] A guide protrusion 122 may be formed on the main body 120. The guide protrusion 122 may be formed on the same surface as the second connection part 130. In addition, the guide protrusion 122 may protrude from a surface facing the guide part 212.

[0084] A plurality of guide protrusions 122 may protrude from both sides of the second connection part 130. The guide protrusion 122 may protrude in the same protrusion direction as the second connection part 130. In addition, the protrusion height H2 of the guide protrusion 122 may be formed higher than the protrusion height H1 of the second connection part 130. In other words, the protruding end part of the guide protrusion 122 may protrude further than the protruding end part of the second connection part 130. Accordingly, even if the device 100 is dropped or collides with other components, it may be protected by the guide protrusion 122, and contact with the second connection part 130 may be prevented, thereby preventing the second connection part 130 from being damaged.

[0085] In addition, when the end part of the guide protrusion 122 is completely inserted into the guide part 212 and comes into contact with the bottom of the guide part 212, the first connection part 220 and the second connection part 130 can be completely coupled to each other. Therefore, the connection state of the first connection part 220 and the second connection part 130 can be confirmed and guaranteed by the coupling of the guide protrusion 122 and the guide part 212.

[0086] The device 100 may further include a device cover 110. The device cover 110 may form one surface of the main body 120 and may shield the opening of the accommodation member 200. The device cover 110 may extend outward along the circumference of the main body 120 and may shield the opening of the mounting space 211. Accordingly, when the device 100 is mounted on the accommodation member 200, the device cover 110 may be exposed to the storage space to form an exposed appearance of the device 100.

[0087] In addition, according to the type of the device 100, at least a part of the module 140 may be exposed by passing through the device cover 110. For example, if the device 100 is a camera device, a part of the camera device may be exposed by passing through the device cover 110 to photograph food inside the storage space.

[0088] Below, the device 100 will be examined in more detail with reference to the drawings in terms of its mounted and unmounted state.

[0089] FIG. 7 is a cross-sectional view taken along line VII-VII' of FIG. 2, and FIG. 8 is an exploded perspective view illustrating the device.

[0090] As illustrated, the accommodation member 200 is mounted on the inner case 102, and the mounting space 211 inside the accommodation member 200 can provide a space that is more recessed than the outer surface of the inner case 102.

[0091] Meanwhile, due to the installation of the accommodation member 200, the space between the inner case 102 and the outer case 101 is reduced, and an insulation member 104 can be further disposed in the accommodation member 200. Unlike the insulation material 103, the insulation member 104 can be mounted in a molded state, and can be formed in a plate or sheet shape covering the accommodation member 200. The insulation member 104 can be formed of a material having better insulation performance than the insulation material 103. In other words, the insulation member 104 can be formed of a material having a higher insulation coefficient than the insulation material 103. For example, the insulation member 104 can be formed of a vacuum insulation material. By disposing the insulation member 104 on the outer surface of the accommodation member 200, it is possible to prevent the insulation performance from being reduced at the location where the accommodation member 200 is mounted.

[0092] In addition, the device 100 may include the main body 120 and the device cover 110. The main body 120 may be formed to have an open bottom, and may be formed to accommodate the module 140 inside. In addition, an opening 123 may be formed on the upper surface of the main body 120 through which the first connection part 220 protrudes. In addition, the guide protrusions 122 may be formed on both sides of the opening 123.

[0093] The device cover 110 may include a plate part 111 that shields the opened lower surface of the main body 120 and a edge part 112 surrounding the plate part. Accordingly, the device cover 110 may be formed in a

shape in which the upper surface is open. In addition, the lower end of the cover main body 120 may be mounted so as to be in contact with the edge part 112.

[0094] Meanwhile, the module 140 may be fixedly mounted on the inside of the device cover 110. The module 140 may be mounted on the device cover 110 by a screw 115. Therefore, in order to service the module, the device cover 110 may be separated to access the module 140. In addition, a boss 113, 114 to which a screw 115 is fastened may be further formed on the device cover 110. A plurality of bosses 113 may be formed. The screw 115 passing through the boss 113 may be fastened to the inside of the main body 120. Therefore, the device cover 110 and the main body 120 may be maintained in a state of being firmly coupled by the screw 115. In addition, although not illustrated in detail, the space between the device cover 110 and the main body 120 may be sealed to prevent water or moisture from penetrating.

[0095] FIG. 9 is a cross-sectional view taken along line IX-IX' of FIG. 3, and FIG. 10 is a perspective view illustrating a cover according to an embodiment of the present disclosure.

[0096] As illustrated, when the device 100 is not mounted, the cover 190 can be mounted on the accommodation member 200 to shield the mounting space of the accommodation member 200. In addition, the exposure of the recessed space of the accommodation member 200 can be prevented, and a part of the inner surface of the storage space can be formed by the cover 190.

[0097] In addition, by mounting the cover 190, exposure of the second connection part 130 inside the mounting space 211 can be prevented, and thus damage to the second connection part 130 and safety accidents can be prevented.

[0098] The cover 190 may include a cover plate 191 of the plate shape and a cover edge 192 bent along the circumference of the cover plate 191. When the cover 190 is mounted on the accommodation member 200, the cover plate 191 may shield the mounting space 211, and the cover edge 192 may come into contact with the inner circumference of the mounting space 211.

[0099] Meanwhile, a plurality of cover fixing parts 193 may be formed on the inner side of the cover 190. The cover fixing parts 193 may extend upward from the cover plate 191 or the cover edge 192, and may be formed to be caught and restrained on the inner side of the case 210 when the cover 190 is mounted.

[0100] The cover fixing part 193 may be formed at opposite positions on both sides so that both sides of the cover 190 may be coupled to the accommodation member 200. In addition, the cover fixing part 193 may be formed to have elasticity, so that when the cover 190 is mounted or separated, the cover fixing part 193 may be elastically deformed and coupled to the case 210.

[0101] Meanwhile, the insulation member 104 is disposed on the outer surface of the accommodation member 200 so that the insulation performance can be maintained even when the mounting space 211 of the accom-

modation member 200 is empty.

[0102] Below, the operation of the refrigerator 1 will be described in detail with reference to the drawings.

[0103] FIG. 11 is a block diagram schematically illustrating the connection state of the main components of the refrigerator, and FIG. 12 is a flowchart sequentially illustrating the operation of the refrigerator according to the mounting of the device.

[0104] As illustrated in the drawing, when power is input to the refrigerator 1, the driving part 16 composed of components for cooling such as a compressor of the refrigerator 1 is driven, and the operation of the refrigerator 1 can start. At this time, the control part 14 controls the operation of the driving part 16 according to the manipulation input from the manipulation part 17. Then, the control part 14 controls the operation of the driving part 16 so that the temperature of the storage space detected by the temperature sensor 18 is maintained at a set temperature, and such normal operation can be referred to as a general operation. [S100]

[0105] When general operation is started, the user can mount the device 100 on the refrigerator 1 as needed. At this time, the location where the device 100 is mounted can be a set location among a plurality of accommodation members 200, such as the first accommodation member 200 and the second accommodation member 200, and the user can mount the device 100 at a location suitable for the operation of the device 100.

[0106] In order to mount the device 100, the user separates the cover 190 from the accommodation member 200 to expose the second connection part 130, and mounts the device 100 in the mounting space 211 where the second connection part 130 is exposed. [S210]

[0107] When the device 100 is mounted and the first connection part 220 and the second connection part 130 are connected to each other, the control part 14 can recognize the device 100.

[0108] By simply mounting the device 100 on the accommodation member 200, power is supplied to the device 100, and the device 100 and the control part 14 are connected in a communicable state, so that information of the device 100 can be recognized.

[0109] At this time, the control part 14 may store a program for driving the device 100. In addition, if the refrigerator 1 is equipped with a communication part 19 and has a structure capable of communicating with the outside, the program for driving the device 100 may be received and installed from a remote location. In addition, when the device 100 is released through periodic communication with a remote location, the program for operating the device 100 may be updated in the control part 14 regardless of whether the device 100 is mounted. Of course, the program for driving may be built into the device 100 and the program for driving may be installed in the control part 14 along with the mounting of the device 100. [S220]

[0110] When the mounting and recognition of the device 100 is completed, the control part 14 activates a

corresponding program for the operation of the device 100. In other words, among the programs of various devices 100 installed in the control part 14, the information of the actually mounted device 100 is recognized, and the corresponding program is activated accordingly. [S230]

[0111] After the mounting and recognition of the device 100 is completed and the corresponding program for driving the device 100 is activated, the normal recognition state of the additional device 100 can be guided.

[0112] For example, the output part 141 or the remote user terminal can be notified of the normal recognition completion of the device 100 and the standby state of the operation of the device 100. [S240]

[0113] Meanwhile, when normal mounting and recognition of the device 100 are completed, the device 100 can be operated according to the set corresponding program. Although it may vary according to the type of the device 100, if the corresponding program is normally activated, the device 100 performs the set operation along with recognition of the device 100.

[0114] Of course, the user may set and manipulate the operation of the device 100, and when the corresponding program is activated, the user may set the operation of the device 100 through the manipulation of the manipulation part 17 or the user terminal. [S250]

[0115] While the operation of the device 100 is performed by the response program, the control part 14 controls the driving part 16 to continuously perform the general operation. Of course, according to the type and operation of the device 100, other operations that are dependent on or changed by the device 100 other than the general operation may be performed. [S120]

[0116] Meanwhile, in the process of mounting the device 100, if the device 100 is not mounted normally in the accommodation member 200 or the device 100 is not recognized normally due to another problem, the non-recognition state of the additional device 100 is notified.

[0117] In other words, the control part 14 can inform the user that there is a problem with the mounting or recognition of the device 100 through the output part 141 or the user terminal. At this time, the control part 14 can analyze which part of the mounting or recognition of the device 100 caused the problem and inform the user of the problem, so that the user can take appropriate measures to solve the problem.

[0118] In addition, the user may be able to mount a plurality of devices 100, and the plurality of devices 100 may be selectively mounted at appropriate locations in a plurality of accommodation members 200, such as the first accommodation member 201 and the second accommodation member 202.

[0119] In addition, the recognition and activation of the device 100 may be performed by sequentially repeating the above-described process, and when the plurality of devices 100 are mounted at the same time, the plurality of devices 100 may be recognized simultaneously.

[0120] The present disclosure may have various other

embodiments in addition to the embodiments described above.

[0121] Unlike the above-described embodiment according to another embodiment of the present disclosure, the device may be placed on the door side rather than the cabinet inside the storage space. Of course, the device may be mounted in a combination of the mounting positions of the above-described embodiment as well as the mounting positions of other embodiments described below.

[0122] Hereinafter, the device according to another embodiment of the present disclosure will be described with reference to the drawings. The basic structure of the device and the accommodation member is the same, and since there is only a difference in the disposition positions of the device and the accommodation member, detailed descriptions and drawings of the same components will be omitted and the same drawing symbols will be used for description.

[0123] FIG. 13 is a partial perspective view illustrating the mounting state of the device according to another embodiment of the present disclosure.

[0124] A refrigerator 1 according to another embodiment of the present disclosure may be provided with a plurality of doors 20 for opening and closing the storage space of the cabinet 10. In addition, the refrigerating compartment door 21 for opening and closing the refrigerating compartment 12 may include the main door 40 and the sub door 30.

[0125] In addition, a viewing part 31 may be formed in the sub-door 30 to allow viewing of the opening 41 of the main door 40.

[0126] Meanwhile, the rear surface of the sub-door 30 may be formed by a door liner 33. In addition, a device 100' may be provided on one side of the door liner 33 corresponding to the inner side of the opening 41. For example, the device 100' may be a camera device, and the food stored in the opening 41 or a space communicating with the opening 41 may be photographed and analyzed by the device 100'.

[0127] The door liner 33 may be provided with an accommodation member 200', and the device 100' may be detachably mounted on the accommodation member 200'. In addition, a plurality of accommodation members 200' may be provided on the door liner 33. Accordingly, the device 100' may be mounted by the user according to the user's needs.

[0128] In detail, as illustrated in (a) of FIG. 13, when the device 100' is mounted on the accommodation member 200', the accommodation member 200' can be shielded by the device cover 110' of the device 100', and the module 140' can be exposed through the device cover 33 to photograph the inside of the opening 41.

[0129] Meanwhile, as illustrated in (b) of Fig. 13, when the use of the device 100' is not required, the cover 190' may be mounted on the accommodation member 200' instead of the device 100'. The cover 190' shields the accommodation member 200' so that the mounting

space 211 is not exposed, and the cover 190' forms a part of the outer appearance of the rear surface of the sub-door 30.

[0130] In this way, the device 100' may be mounted on the rear surface of the sub-door 30, and although not illustrated in detail, it may be positioned on the rear surface of the door 20, 40 in the same manner.

[0131] Fig. 14 is a partial perspective view illustrating the mounting state of the device according to another embodiment of the present disclosure.

[0132] According to another embodiment of the present disclosure, the refrigerator may be provided with a plurality of doors for opening and closing the storage space of the cabinet. In addition, the doors may include a refrigerating compartment door and a freezing compartment door.

[0133] The refrigerating compartment door 21 may be configured as a pair of French type doors arranged side by side. In addition, the pair of refrigerating compartment doors 21 may be rotated to partially or completely open and close the refrigerating compartment 12.

[0134] In addition, a filler 203 may be provided at the end part of one of the pair of refrigerating compartment doors 21. The filler 203 serves to shield the space between the pair of refrigerating compartment doors 21, and may be extended vertically along the end part of the refrigerating compartment door 21 and may be rotatably mounted.

[0135] The filler 203 may be rotatably mounted on an end part of one side of the refrigerating compartment door 21, that is, an end part adjacent to the other refrigerating compartment door 22. The filler 203 may be mounted on a door liner 202 forming the rear surface of the refrigerating compartment door 21. Then, when the refrigerating compartment door 21 is open, the filler maintains a state where the side end of the refrigerating compartment door 21 is bent, and when the refrigerating compartment door 21 is closed, the filler unfolds and blocks the space between the pair of refrigerating compartment doors 21 by rotating.

[0136] Meanwhile, a device 100" may be provided on one side of the filler 203. For example, the device 100" may be a camera device, and food stored inside the refrigerating compartment 12 may be photographed and analyzed by the device 100".

[0137] The filler 203 may be provided with an accommodation member 200", and the device 100" may be detachably mounted on the accommodation member 200". In addition, a plurality of accommodation members 200" may be provided on the filler 203. Accordingly, the device 100" may be mounted by the user according to the user's needs.

[0138] In detail, as illustrated in (a) of FIG. 14, when the device 100" is mounted on the accommodation member 200", the accommodation member 200" can be shielded by the device cover 110" of the device 100", and the module 140" can be exposed through the device cover 110" to photograph the inside of the refrigerating com-

partment 12.

[0139] Meanwhile, as illustrated in (b) of Fig. 14, when the use of the device 100" is not required, the cover 190" may be mounted on the accommodation member 200" instead of the device 100". The cover 190" shields the accommodation member 200" so that the mounting space 211 is not exposed, and the cover 190" forms a part of the outer appearance of the rear surface of the filler 203.

[0140] In this way, the device 100" may be mounted on the filler 203 provided on the refrigerating compartment door 21, and although not illustrated in detail, the filler 203 on which the device 100" is mounted may be provided on the freezing compartment door 22.

INDUSTRIAL APPLICABILITY

[0141] The refrigerator according to an embodiment of the present disclosure has high industrial applicability because it can provide a product that suits the user's taste by mounting additional devices inside the refrigerator.

Claims

1. A refrigerator comprising:

a cabinet (10) forming a storage space;
a door opening and closing the storage space;
an accommodation member provided in the storage space; and
a device detachably mounted on the accommodation member and performing an additional function in a connected state,
wherein the accommodation member is provided with a first connection part connected to a control part for controlling the device,
wherein the device is provided with a second connection part, and
wherein when the device is mounted, the first connection part and the second connection part are connected to each other so as to supply power to the device and transmit signals to the control part.

2. The refrigerator of claim 1, wherein the cabinet includes:

an outer case forming an outer appearance;
an inner case forming the storage space; and
an insulation material filled between the outer case and the inner case, and
wherein the accommodation member is provided in the inner case and is embedded by the insulation material..

3. The refrigerator of claim 2, wherein the accommoda-

tion member forms a recessed space to accommodate at least a part of the device, and wherein the space is recessed into the wall surface of the storage space.

4. The refrigerator of claim 3, wherein an insulation member which is in contact with the insulation member and has a higher insulation coefficient than the insulation member is disposed on the outer surface of the accommodation member. 5
5. The refrigerator of claim 3, wherein the first connection part is provided in the space and protrudes toward the direction into which the device is inserted. 10
6. The refrigerator of claim 1, wherein the accommodation member includes a case forming a mounting space in which the device is received, and wherein the first connection part is provided at a position facing the second connection part and is connected to the second connection part during the mounting process of the device. 15
7. The refrigerator of claim 6, wherein a fitting part is formed which is formed in a shape corresponding to each other around the case and the device, and when the device is mounted, comes into contact with each other to have a directionality. 20
8. The refrigerator of claim 6, further comprising: 25
 - a guide projection protruding from the device and extending in the same direction as the second connection part; and
 - a guide part recessed into the case facing the guide projection and formed on the same surface as the first connection part, wherein while the guide projection is inserted into the guide part, the coupling the first connection part and the second connection part are guided. 30
9. The refrigerator of claim 8, wherein the guide protrusion is formed symmetrically with respect to the second connection part. 35
10. The refrigerator of claim 8, wherein the guide projection is formed to protrude further than the second connection part. 40
11. The refrigerator of claim 6, wherein the device includes: 45
 - a module connected to the second connection part and for driving the device, 50
 - a main body accommodating the module and through which the second connection part is exposed; and 55

a device cover shielding the mounting space and is exposed to the storage space.

12. The refrigerator of claim 1, further comprising a cover detachably mounted on the accommodation member and shielding the first connection part when the device is not mounted.
13. The refrigerator of claim 12, wherein the cover forms a part of the wall surface of the storage space while being mounted on the accommodation member.
14. The refrigerator of claim 1, wherein a plurality of the accommodation members are provided in the storage space, and wherein the device is mounted in at least one of the plurality of accommodation members.
15. The refrigerator of claim 1, wherein the first connection part and the second connection part are configured as USB terminals.
16. The refrigerator of claim 1, wherein the control part is configured to recognize the type of the device, and wherein a corresponding program for driving the recognized device is stored.
17. The refrigerator of claim 1, wherein the device is exposed to the inside of the storage space while mounted on the accommodation member.
18. The refrigerator of claim 1, wherein the accommodation member is provided in a door liner forming the rear surface of the door.
19. The refrigerator of claim 1, further comprising a filler shielding between a pair of doors disposed in parallel, wherein the accommodation member is provided in the filler.
20. The refrigerator of claim 1, wherein the control part is provided in the cabinet and controls the operation of the refrigerator and the device.

Figure 1

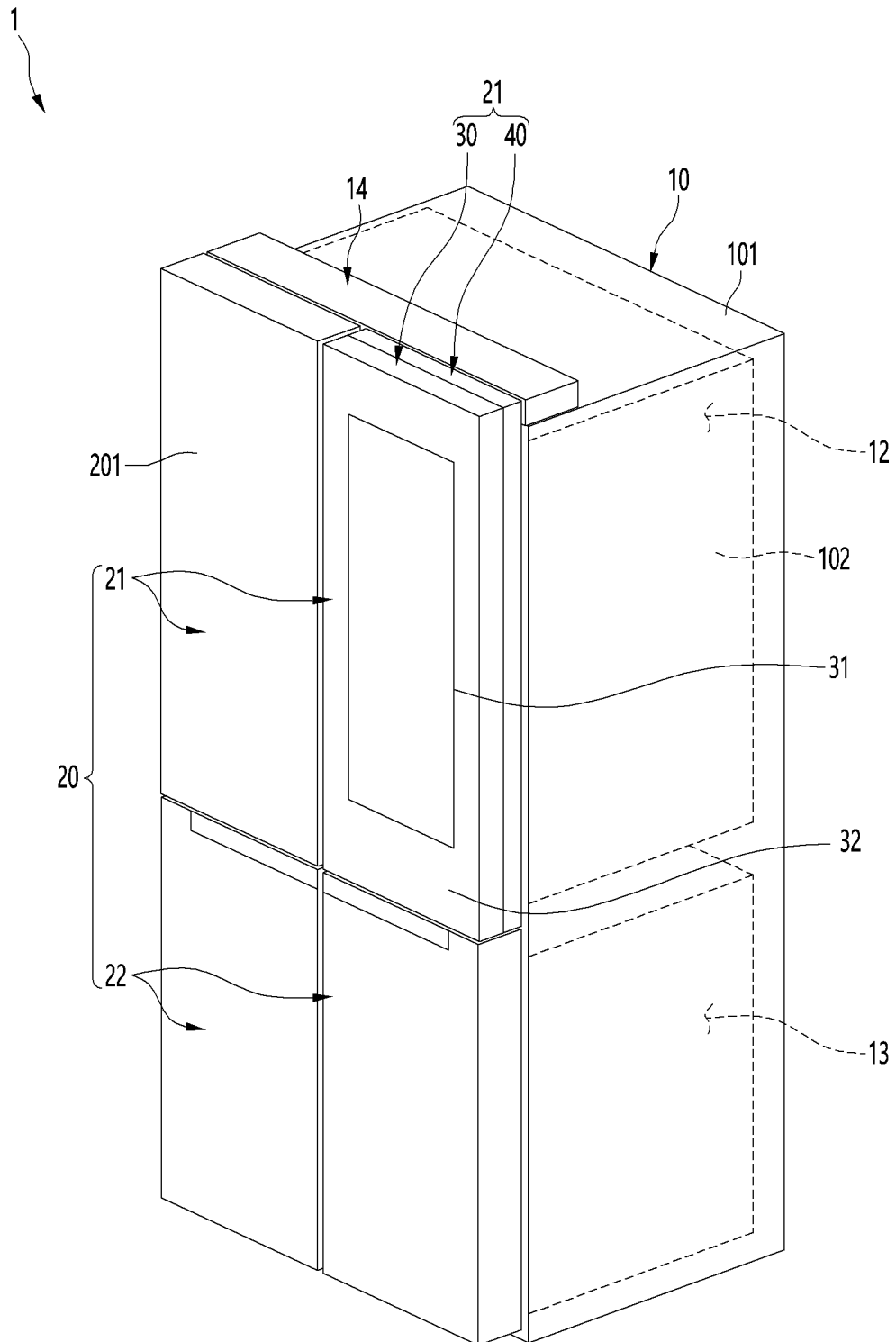


Figure 2

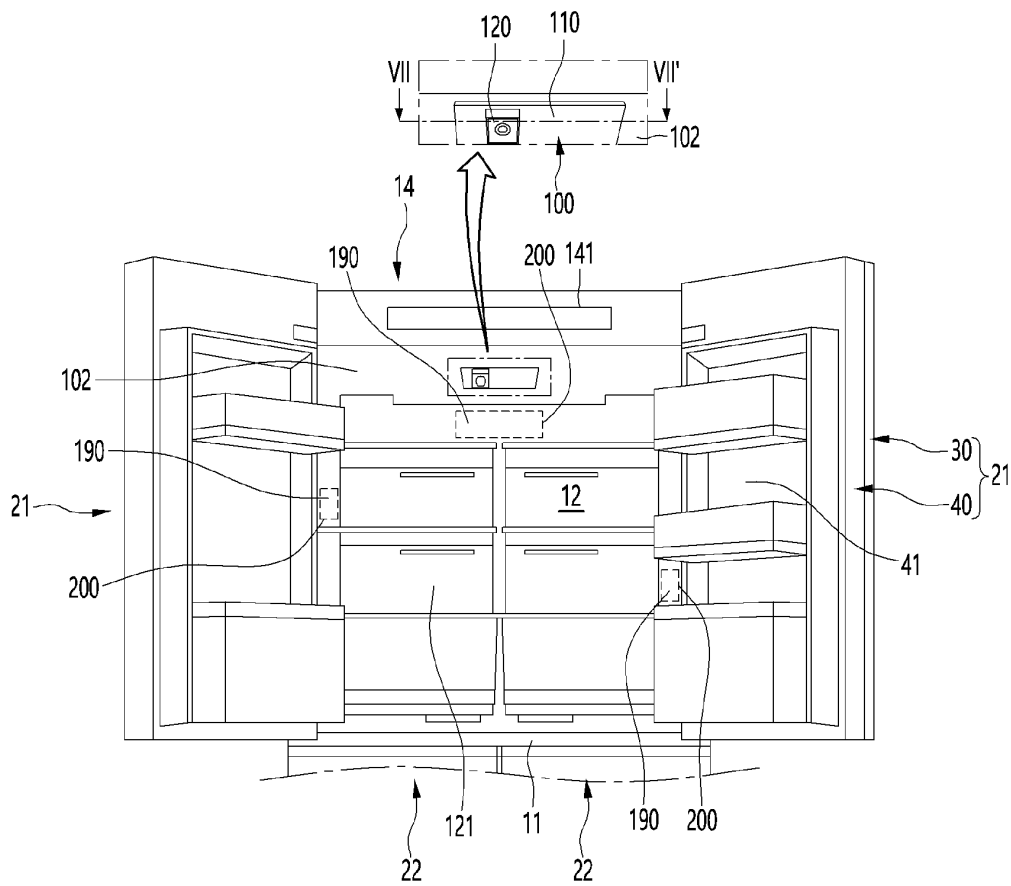


Figure 3

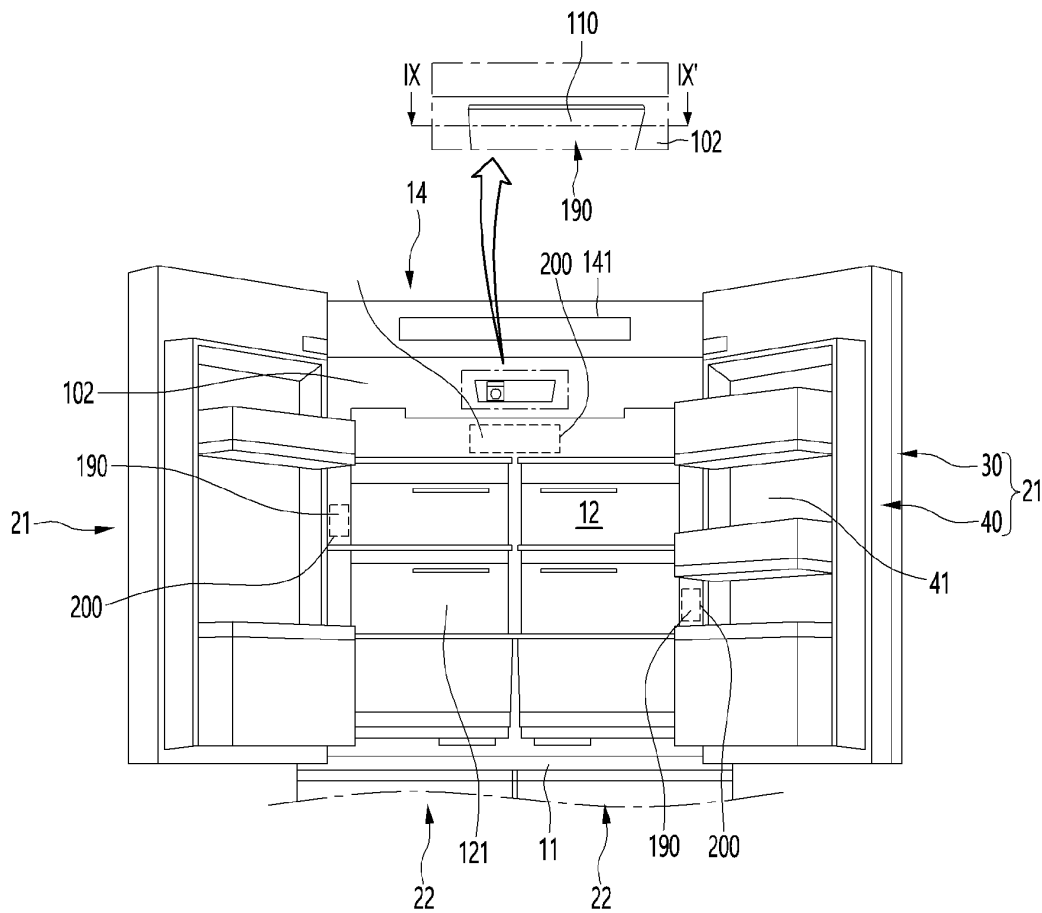


Figure 4

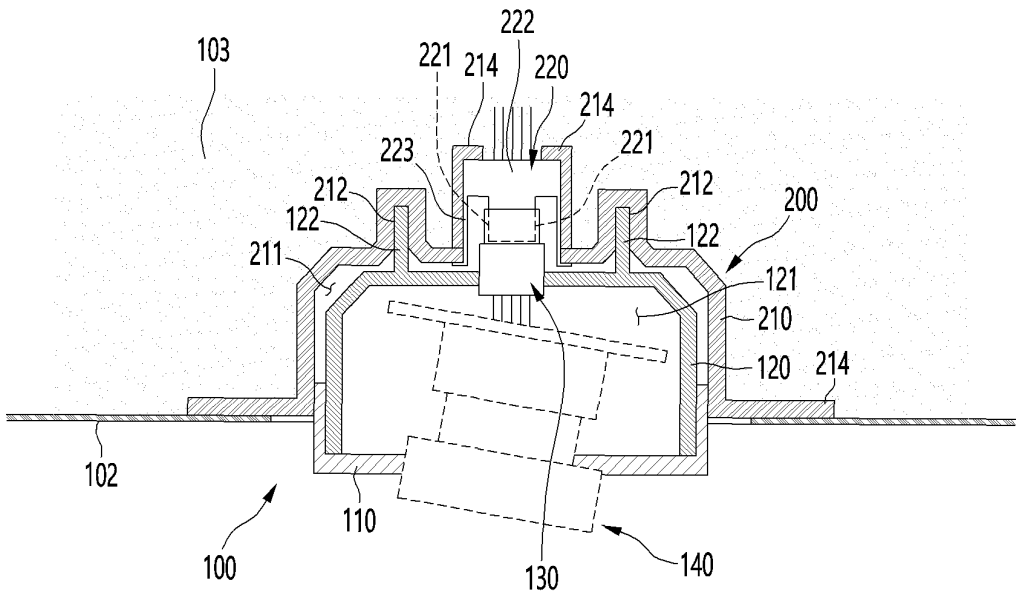


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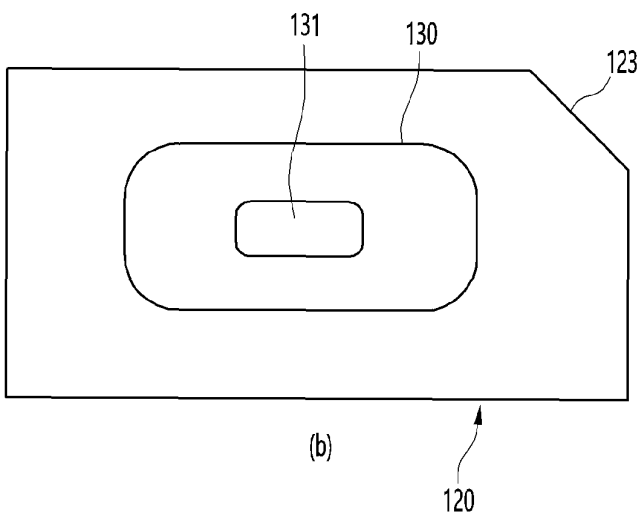
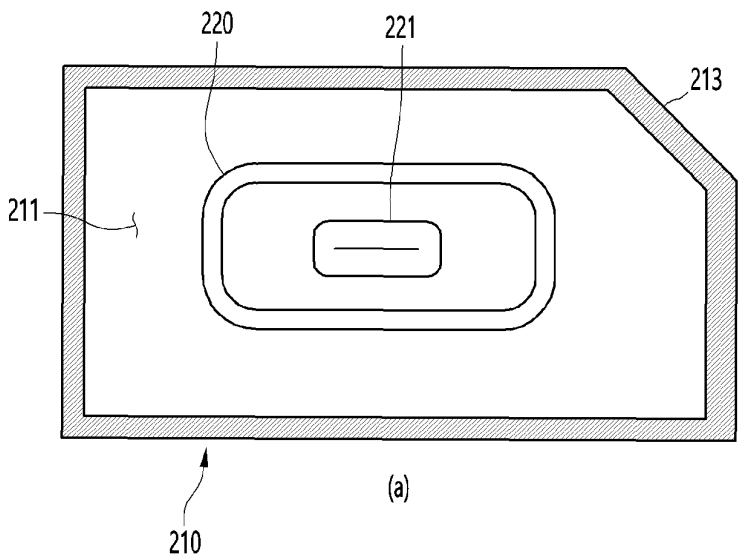


Figure 6

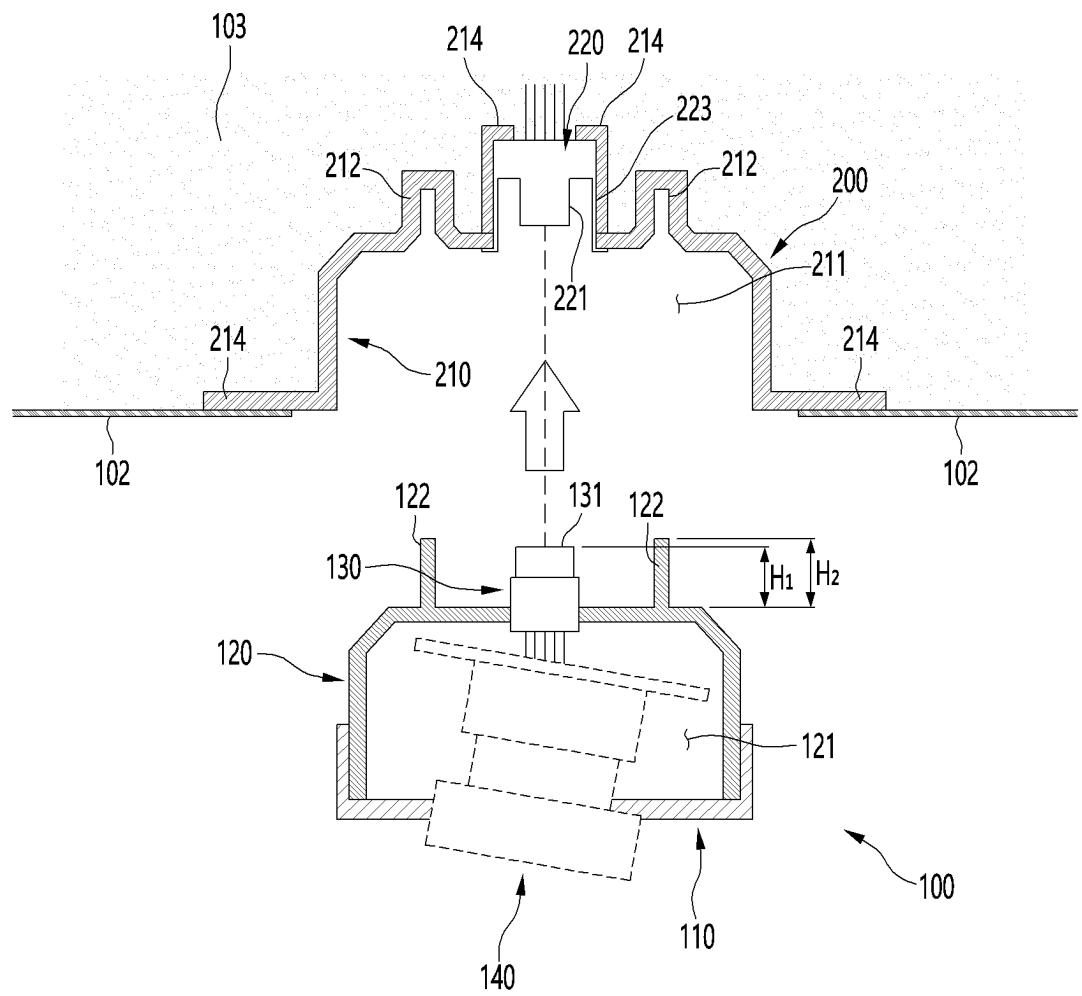


Figure 7

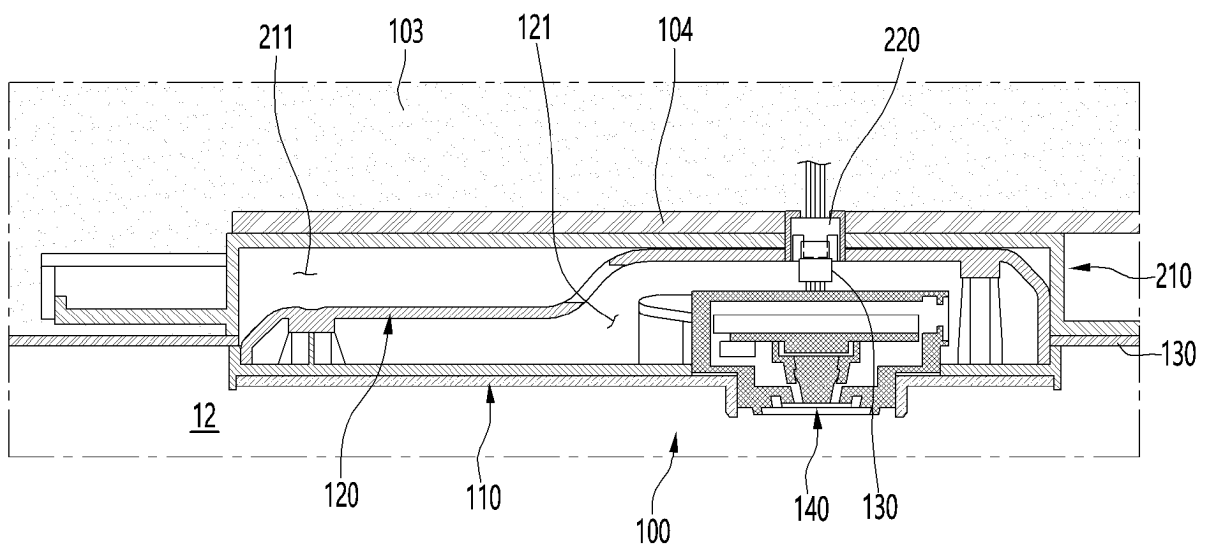


Figure 8

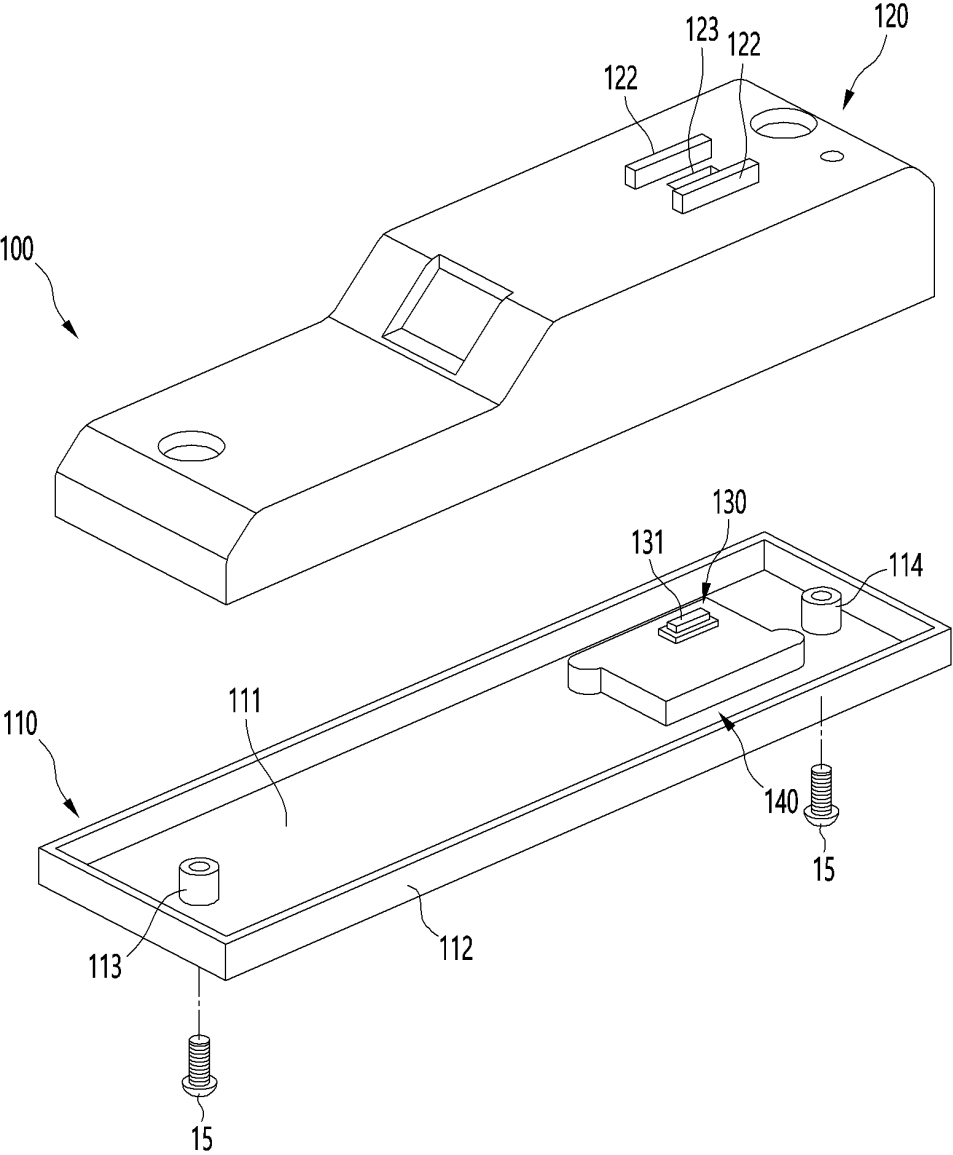


Figure 9

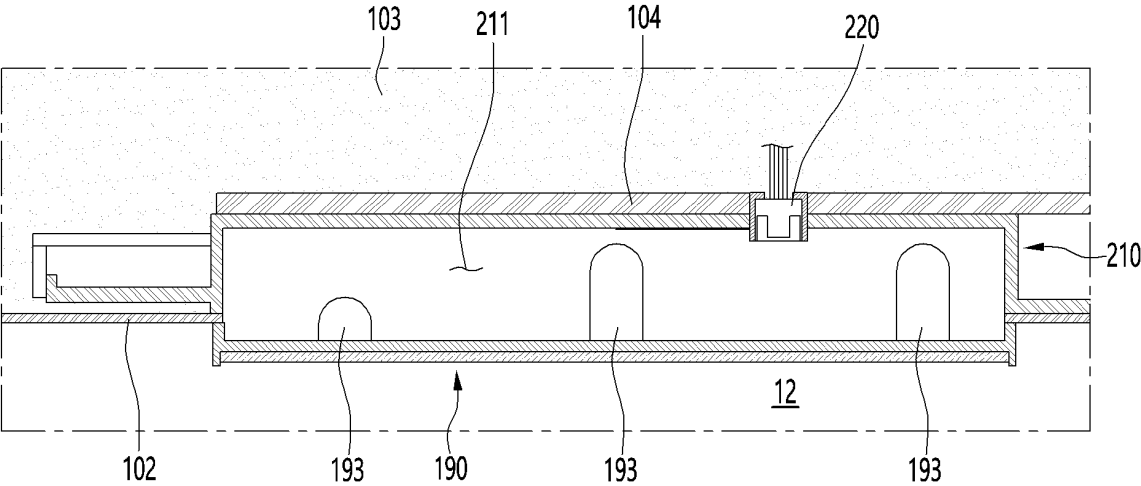


Figure 10

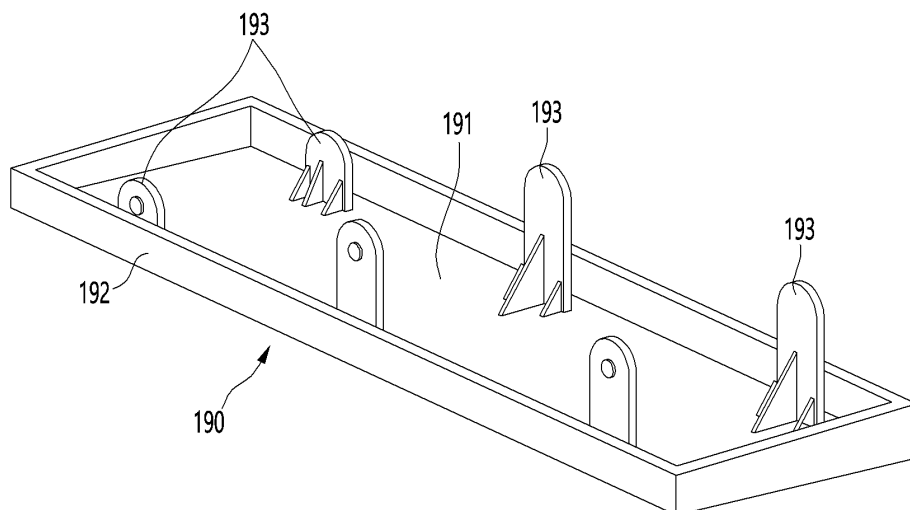


Figure 11

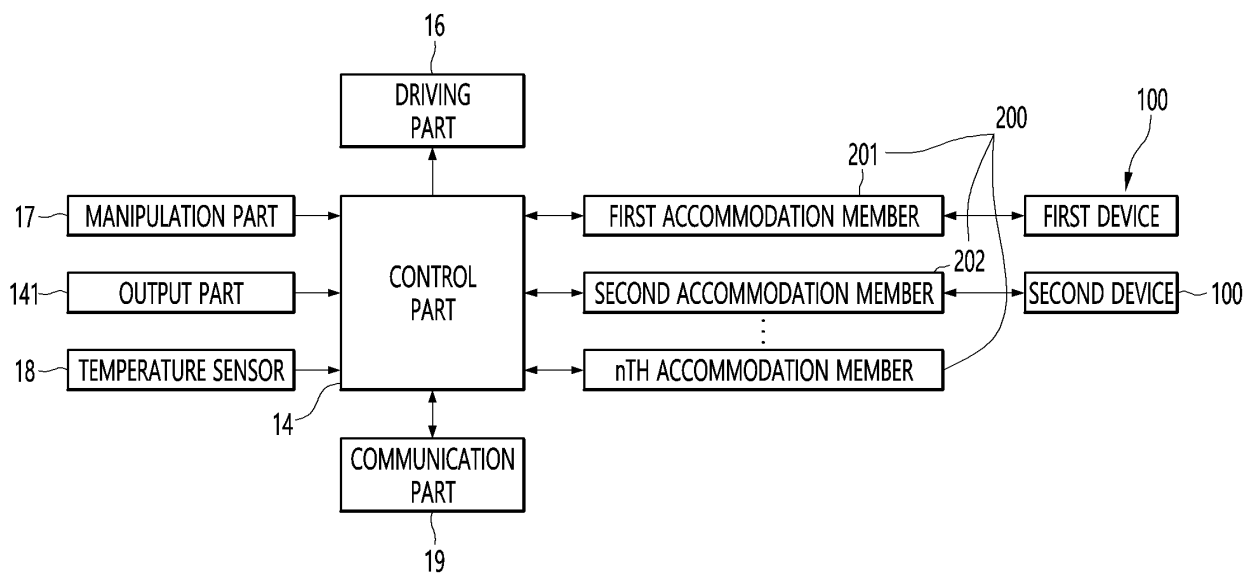


Figure 12

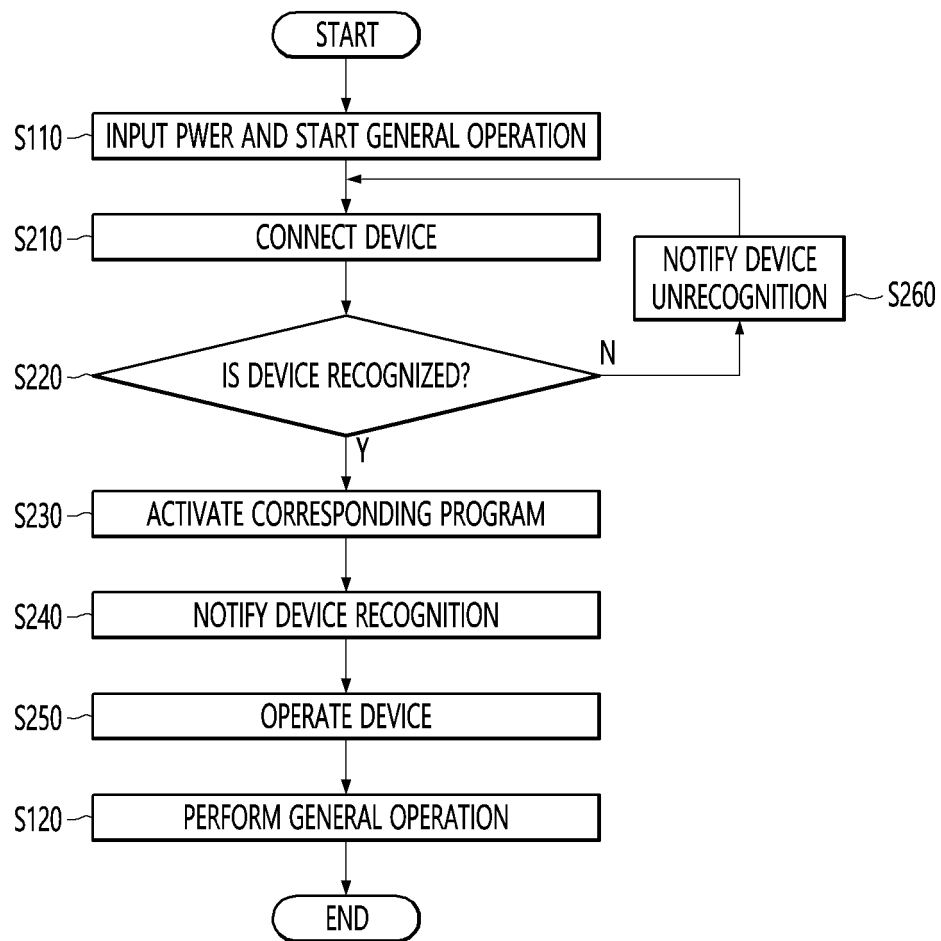


Figure 13

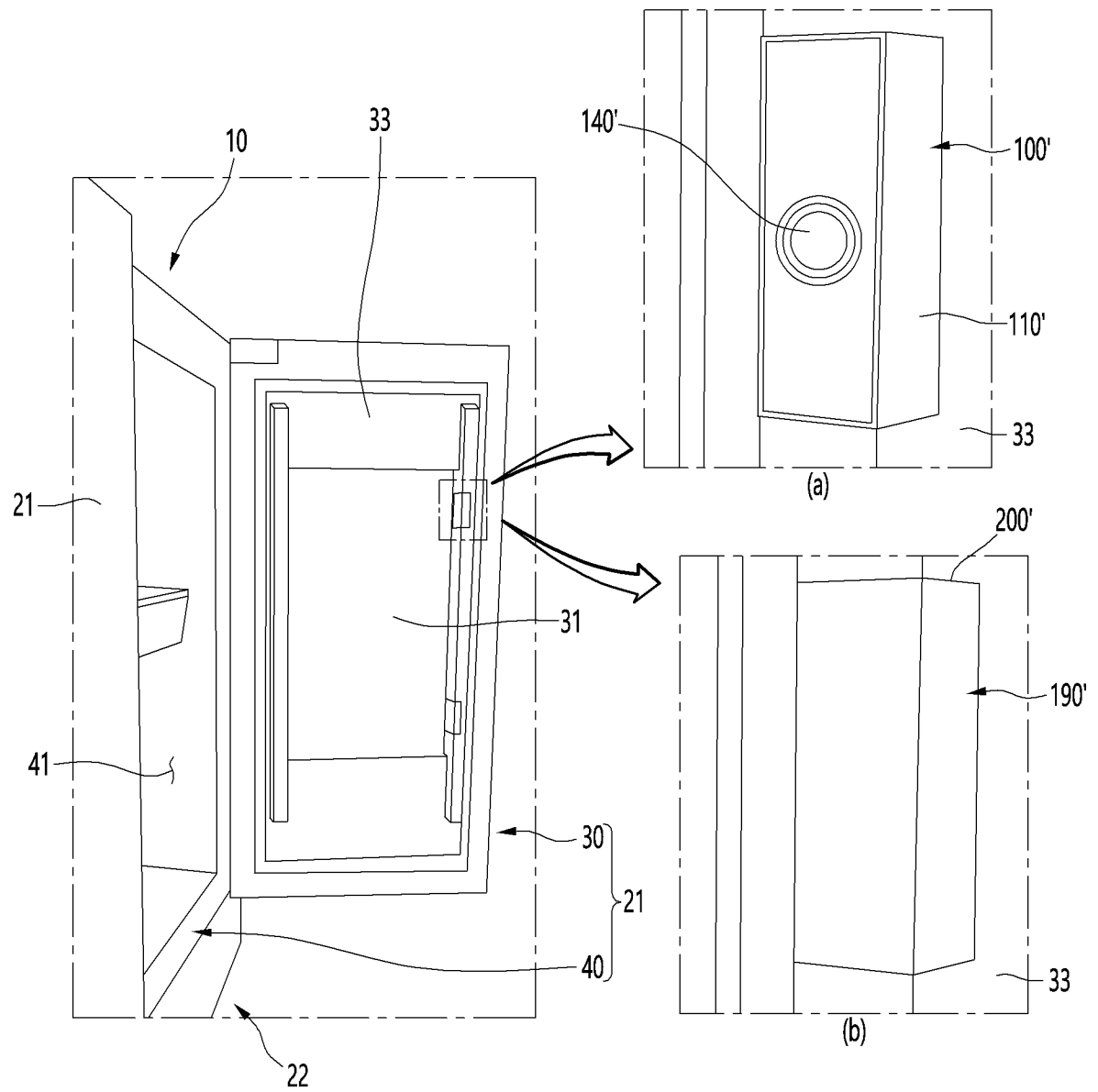
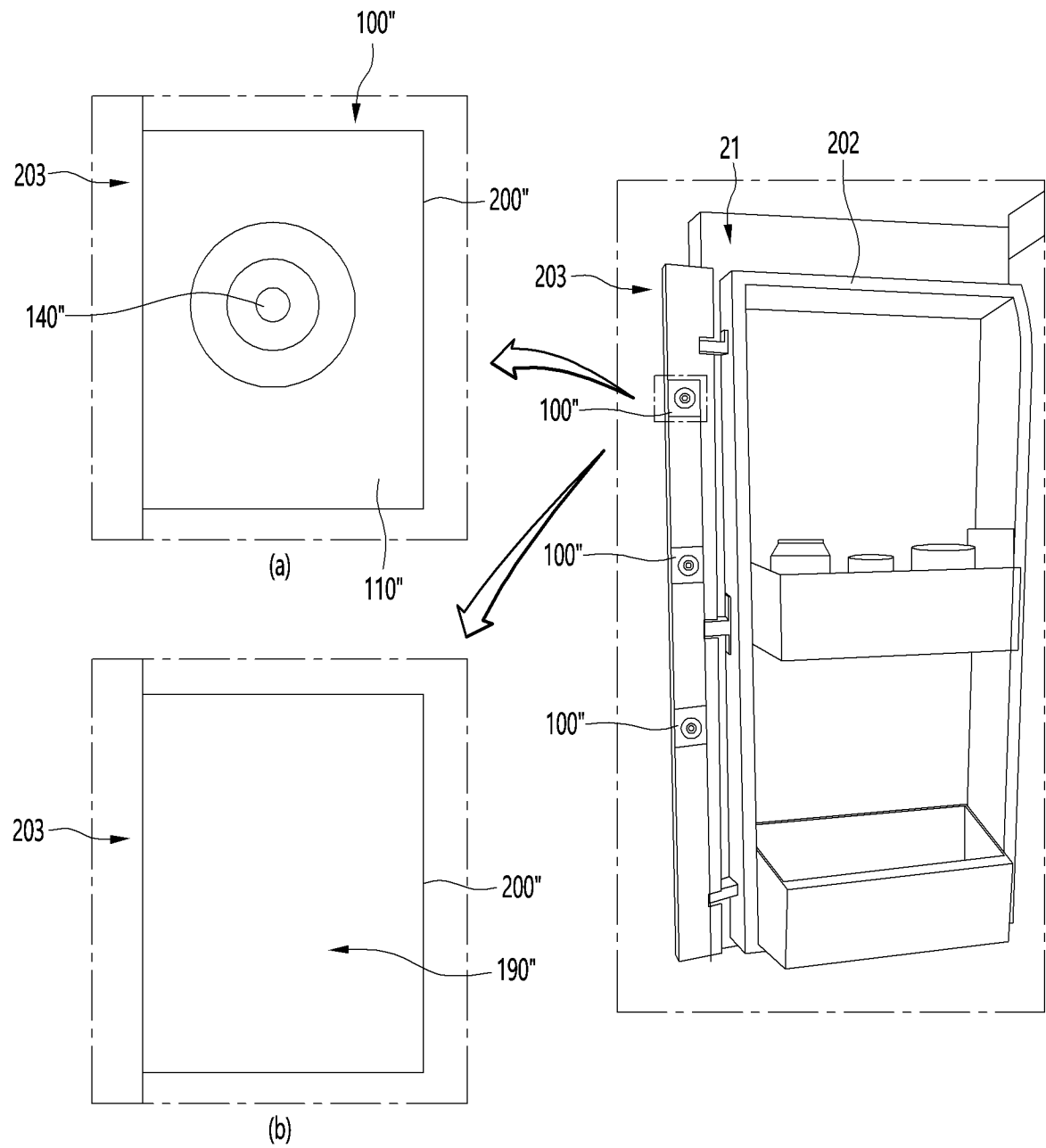


Figure 14



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2023/005197

A. CLASSIFICATION OF SUBJECT MATTER F25D 23/06(2006.01)i; F25D 29/00(2006.01)i; F25D 23/02(2006.01)i According to International Patent Classification (IPC) or to both national classification and IPC	B. FIELDS SEARCHED																		
Minimum documentation searched (classification system followed by classification symbols) F25D 23/06(2006.01); F25D 11/02(2006.01); F25D 17/06(2006.01); F25D 23/00(2006.01); F25D 23/02(2006.01); F25D 27/00(2006.01); F25D 29/00(2006.01)	Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Korean utility models and applications for utility models: IPC as above Japanese utility models and applications for utility models: IPC as above																		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) eKOMPASS (KIPO internal) & keywords: 냉장고(refrigerator), 수용부재(accommodating member), 디바이스(device), 카메라(camera), 연결부(connector), 함몰(recess), 돌기(projection), 커버(cover)	C. DOCUMENTS CONSIDERED TO BE RELEVANT																		
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>KR 10-2022-0030128 A (LG ELECTRONICS INC.) 10 March 2022 (2022-03-10) See paragraphs [0049], [0058], [0062], [0089], [0119]-[0130], [0137] and [0147]-[0151], claim 1 and figures 1-2 and 5-11.</td> <td>1-20</td> </tr> <tr> <td>A</td> <td>KR 20-0158630 Y1 (SAMSUNG ELECTRONICS CO., LTD.) 15 October 1999 (1999-10-15) See paragraphs [0019]-[0024] and figure 3.</td> <td>1-20</td> </tr> <tr> <td>A</td> <td>JP 2015-111025 A (TOSHIBA CORP. et al.) 18 June 2015 (2015-06-18) See paragraphs [0097]-[0101] and figures 26-30.</td> <td>1-20</td> </tr> <tr> <td>A</td> <td>KR 20-0218552 Y1 (DAEWOO ELECTRONICS CO., LTD.) 02 April 2001 (2001-04-02) See paragraphs [0014]-[0018] and figures 2-3.</td> <td>1-20</td> </tr> <tr> <td>A</td> <td>US 2019-0170429 A1 (SAMSUNG ELECTRONICS CO., LTD.) 06 June 2019 (2019-06-06) See paragraphs [0074]-[0087] and figures 6-7.</td> <td>1-20</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	KR 10-2022-0030128 A (LG ELECTRONICS INC.) 10 March 2022 (2022-03-10) See paragraphs [0049], [0058], [0062], [0089], [0119]-[0130], [0137] and [0147]-[0151], claim 1 and figures 1-2 and 5-11.	1-20	A	KR 20-0158630 Y1 (SAMSUNG ELECTRONICS CO., LTD.) 15 October 1999 (1999-10-15) See paragraphs [0019]-[0024] and figure 3.	1-20	A	JP 2015-111025 A (TOSHIBA CORP. et al.) 18 June 2015 (2015-06-18) See paragraphs [0097]-[0101] and figures 26-30.	1-20	A	KR 20-0218552 Y1 (DAEWOO ELECTRONICS CO., LTD.) 02 April 2001 (2001-04-02) See paragraphs [0014]-[0018] and figures 2-3.	1-20	A	US 2019-0170429 A1 (SAMSUNG ELECTRONICS CO., LTD.) 06 June 2019 (2019-06-06) See paragraphs [0074]-[0087] and figures 6-7.	1-20	☐ Further documents are listed in the continuation of Box C.
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																	
X	KR 10-2022-0030128 A (LG ELECTRONICS INC.) 10 March 2022 (2022-03-10) See paragraphs [0049], [0058], [0062], [0089], [0119]-[0130], [0137] and [0147]-[0151], claim 1 and figures 1-2 and 5-11.	1-20																	
A	KR 20-0158630 Y1 (SAMSUNG ELECTRONICS CO., LTD.) 15 October 1999 (1999-10-15) See paragraphs [0019]-[0024] and figure 3.	1-20																	
A	JP 2015-111025 A (TOSHIBA CORP. et al.) 18 June 2015 (2015-06-18) See paragraphs [0097]-[0101] and figures 26-30.	1-20																	
A	KR 20-0218552 Y1 (DAEWOO ELECTRONICS CO., LTD.) 02 April 2001 (2001-04-02) See paragraphs [0014]-[0018] and figures 2-3.	1-20																	
A	US 2019-0170429 A1 (SAMSUNG ELECTRONICS CO., LTD.) 06 June 2019 (2019-06-06) See paragraphs [0074]-[0087] and figures 6-7.	1-20																	
☒ See patent family annex.	* Special categories of cited documents: “A” document defining the general state of the art which is not considered to be of particular relevance “D” document cited by the applicant in the international application “E” earlier application or patent but published on or after the international filing date “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 “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 “&” document member of the same patent family	Date of the actual completion of the international search 20 July 2023																		
Date of mailing of the international search report 20 July 2023	Name and mailing address of the ISA/KR Korean Intellectual Property Office Government Complex-Daejeon Building 4, 189 Cheongsaro, Seo-gu, Daejeon 35208																		
Authorized officer	Facsimile No. +82-42-481-8578																		
Telephone No.	Form PCT/ISA/210 (second sheet) (July 2022)																		

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Information on patent family members

International application No.

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Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
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PCT/KR2023/005197

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