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United States Patent Application Publication	20250257933
Kind Code	A1
Publication Date	August 14, 2025
Inventor(s)	CHEON; Sanghyun et al.

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### REFRIGERATOR

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#### Abstract

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.

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<b>Inventors:</b>	<b>CHEON; Sanghyun (Seoul, KR), LEE; Ikkyu (Seoul, KR), CHO; Yonghyun (Seoul, KR)</b>
<b>Applicant:</b>	<b>LG ELECTRONICS INC. (Seoul, KR)</b>
<b>Family ID:</b>	<b>88835495</b>
<b>Appl. No.:</b>	<b>18/867093</b>
<b>Filed (or PCT Filed):</b>	<b>April 18, 2023</b>
<b>PCT No.:</b>	<b>PCT/KR2023/005197</b>

#### Foreign Application Priority Data

KR	10-2022-0061636	May. 19, 2022
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#### Publication Classification

**Int. Cl.:** F25D23/06 (20060101)

**U.S. Cl.:**

## Background/Summary

### 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 accommodation 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.

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## Description

### DESCRIPTION OF DRAWINGS

[0036] FIG. 1 is a perspective view illustrating a refrigerator according to an embodiment of the present disclosure.

[0037] FIG. 2 is a partial perspective view illustrating a state where a door of the refrigerator is open.

[0038] FIG. 3 is a view illustrating a state where the device is not mounted in FIG. 2.

[0039] FIG. 4 is a cross-sectional view illustrating a state where a device is mounted according to an embodiment of the present disclosure.

[0040] FIG. 5 (a) and (b) are schematic views illustrating the coupled structure of an accommodation member and a device that are coupled to each other.

[0041] FIG. 6 is a cross-sectional view illustrating a state where the device is separated.

[0042] FIG. 7 is a cross-sectional view taken along line VII-VII' of FIG. 2.

[0043] FIG. 8 is an exploded perspective view illustrating the device.

[0044] FIG. 9 is a cross-sectional view taken along line IX-IX' of FIG. 3.

[0045] FIG. 10 is a perspective view illustrating a cover according to an embodiment of the present disclosure.

[0046] FIG. 11 is a block diagram schematically illustrating the connection state of the main components of the refrigerator.

[0047] FIG. 12 is a flowchart sequentially illustrating the operation of the refrigerator according to the mounting of the device.

[0048] FIG. 13 (a) and (b) are partial perspective views illustrating the mounting state of the device according to another embodiment of the present disclosure.

[0049] FIG. 14 (a) and (b) are partial perspective views illustrating the mounting state of the device

according to another embodiment of the present disclosure.

## BEST MODE

[0050] 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.

[0051] 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.

[0052] FIG. **1** is a perspective view illustrating a refrigerator according to an embodiment of the present disclosure.

[0053] 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.

[0054] 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**.

[0055] 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.

[0056] 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 part may be provided and placed at different locations, respectively.

[0057] 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.

[0058] 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.

[0059] 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.

[0060] 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**.

[0061] 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.

[0062] Below, the structure inside the storage space of the refrigerator **1** will be examined with reference to the drawings.

[0063] 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.

[0064] 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**.

[0065] 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.

[0066] 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.

[0067] 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.

[0068] 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.

[0069] 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**.

[0070] 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**.

[0071] 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**.

[0072] 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.

[0073] 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**.

[0074] 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.

[0075] 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**.

[0076] 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.

[0077] Below, the structure of the accommodation member and device will be examined in more detail with reference to the drawings.

[0078] 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.

[0079] 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 mounting position can be firmly fixed.

[0080] 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**.

[0081] 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**.

[0082] 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.

[0083] 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**.

[0084] 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.

[0085] 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.

[0086] 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.

[0087] 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**.

[0088] 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.

[0089] 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.

[0090] 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**.

[0091] 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**.

[0092] 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**.

[0093] 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.

[0094] 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.

[0095] 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**.

[0096] 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**.

[0097] 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.

[0098] 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**.

[0099] 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**.

[0100] 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.

[0101] Below, the device **100** will be examined in more detail with reference to the drawings in terms of its mounted and unmounted state.

[0102] 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.

[0103] 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**.

[0104] 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.

[0105] 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**.

[0106] 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**.

[0107] 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.

[0108] 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.

[0109] 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**.

[0110] 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.

[0111] 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**. [0112] 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.

[0113] 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**.

[0114] 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 accommodation member **200** is empty.

[0115] Below, the operation of the refrigerator **1** will be described in detail with reference to the drawings.

[0116] 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.

[0117] 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]

[0118] 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**.

[0119] 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]

[0120] 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**.

[0121] 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.

[0122] 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]

[0123] 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]

[0124] 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.

[0125] 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]

[0126] 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**.

[0127] 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]

[0128] 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]

[0129] 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.

[0130] 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.

[0131] 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**.

[0132] 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.

[0133] The present disclosure may have various other embodiments in addition to the embodiments described above.

[0134] Unlike the above-described embodiment 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.

[0135] 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.

[0136] FIG. **13** is a partial perspective view illustrating the mounting state of the device according to another embodiment of the present disclosure.

[0137] 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**.

[0138] 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**.

[0139] 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'**.

[0140] 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.

[0141] 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**.

[0142] 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**.

[0143] 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.

[0144] FIG. **14** is a partial perspective view illustrating the mounting state of the device according to another embodiment of the present disclosure.

[0145] 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.

[0146] 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**.

[0147] 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.

[0148] 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.

[0149] 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''**.

[0150] 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.

[0151] 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 compartment **12**.  
[0152] 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**.

[0153] 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

[0154] 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 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 accommodation 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 material and has a higher insulation coefficient than the insulation material is disposed on the outer surface of the accommodation member.
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.
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.
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.
8. The refrigerator of claim 6, further comprising: 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.
9. The refrigerator of claim 8, wherein the guide protrusion is formed symmetrically with respect to

the second connection part.

- 10.** The refrigerator of claim 8, wherein the guide projection is formed to protrude further than the second connection part.
  - 11.** The refrigerator of claim 6, wherein the device includes: 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 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.
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