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(54) Title: A REFRIGERATOR AND METHOD FOR CONTROLLING SAME

(57) Abstract: The present invention relates to a refrigerator. With the refrigerator according to the embodiment of the present invention, the receiving box is automatically drawn in and out together with the door only by the operation that the user operates an input unit inputting the door drawing in and out orders, thereby increasing the use convenience of children and old people.



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Description

Title of Invention: A REFRIGERATOR AND METHOD FOR CONTROLLING SAME

Technical Field

- [1] This relates to a refrigerator.

Background Art

- [2] Generally, a refrigerator stores items in a refrigerated or frozen state. Refrigerators may be classified as a top mount type refrigerator, a bottom freezer type refrigerator or a side by side type refrigerator, depending on the relative locations of a freezing chamber and a refrigerating chamber.

Disclosure of Invention

Technical Problem

- [3] In the bottom freezer type refrigerator, a freezing chamber is disposed below a refrigerating chamber, a refrigerating chamber door to open and close the refrigerating chamber is rotatably mounted on an edge of one side of a refrigerator main body, and a freezing chamber door to open and close the freezing chamber is disposed in such a way that it is drawn in and out together with a receiving box forward and backward.
- [4] Meanwhile, the freezing chamber is disposed a lower side of the refrigerator, and thus, when the user opens the freezing chamber, he/she should bend his/her waist to pull the door of the freezing chamber forward. As a result, since the user should put forth a higher strength than when pulling the freezing chamber door in a state where the user stands straight, this is inconvenient compared to opening the freezing chamber door.

Solution to Problem

- [5] The present invention proposes to overcome the above problems. It is an object of the present invention to a refrigerator capable of automatically drawing out the receiving box depending on the selection of a user.
- [6] It is an object of the present invention to provide a refrigerator capable of securing the volume of the inside of the refrigerator and preventing the degradation of heat shield performance while providing a function of automatically drawing in and out a receiving box.
- [7] It is an object of the present invention to provide a refrigerator capable securing a volume of the inside of the refrigerator even when a plurality of automatically drawing in and out receiving boxes are continuously formed.
- [8] It is an object of the present invention to provide a refrigerator capable of easily attaching and detaching a drawn in and out door together with a receiving box to the

refrigerator.

- [9] It is an object of the present invention to provide a refrigerator capable of automatically drawing in and out a receiving box and then conveniently receiving foods in an inner space of the receiving box.
- [10] In order to achieve the above objects, there is provided a refrigerator, comprising: a main body that has a storage space storing foods at low temperature; a compressor that is provided at one side of the main body to compress refrigerant; a condenser that condenses the refrigerant compressed in the compressor; an expanding unit that lowers the pressure of the refrigerant condensed in the condenser; an evaporator that exchanges heat between the refrigerant passing through the expanding unit and air to generate cool air; a door that selectively opens and closes the storage space; a receiving box that is provided in the rear of the door and is drawn in and out together with the door; a slide assembly that is provided at a side wall of the storage space so that at least its portion can be drawn out to guide a forward and backward movement of the door; a driving assembly that is mounted on the slide assembly to provide a driving force for allowing the door to move; and a rail connector that is fixed to a rear surface of the door and is connected detachably to the slide assembly, wherein the driving assembly is connected to the slide assembly to move together with the door.
- [11] There is provided a refrigerator, comprising: a main body whose front is opened; an evaporator that is provided at one side of the main body to generate cool air supplied to an inside of the main body; a slide assembly that is provided at an inner wall of the main body so that at least its moving part can be slidingly drawn out forward; a rail connector that is connected to the moving part to be drawn out forward together; a door that is connected to a front end of the rail connector and selectively opens and closes an opening portion of the main body; and a driving assembly that is mounted on the moving part to provide a driving force for allowing the moving part to be slid.

[12]

Advantageous Effects of Invention

- [13] With the refrigerator and according to the embodiment of the present invention as described above, the receiving box is automatically drawn in and out together with the door only by the operation that the user operates an input unit inputting the door drawing in and out orders, thereby increasing the use convenience of children and old people.
- [14] In addition, since the receiving box is automatically drawn out, the receiving box can conveniently be drawn out regardless of the weight of foods received in the receiving box.
- [15] Further, since the driving motor for automatically drawing out the receiving box is

not fixedly mounted to the main body of the refrigerator and can be moved together with the receiving box, the volume of the inside of the refrigerator is removed.

[16] Also, since the driving motor is not fixedly mounted to the main body and can be moved together with the receiving box, the heat shield effect is reduced due to the reduction in the thickness of the heat shield layer of the main body.

[17] Also, when the receiving box can be automatically drawn in and out continuously, the driving motor is movably provided together with the receiving box, making it possible to sufficiently use the space between the continued receiving boxes.

[18] Moreover, the driving motor is not directly connected to the components that are connected to the door, making it possible to conveniently attach and detach the door if necessary.

[19] Further, the guide guiding the movement of the receiving box is formed to be sufficiently long in the front and rear direction of the main body to draw out the door and the receiving box, making it possible to conveniently receive foods in the inner space of the receiving box.

Brief Description of Drawings

[20] FIG. 1 is a diagram showing a refrigerator according to an embodiment of the present invention;

[21] FIG. 2 is a diagram showing a shape where an upper door of FIG. 1 is drawn out;

[22] FIG. 3 is an exploded perspective view of the upper door of FIG. 2; and

[23] FIG. 4 is an exploded perspective view showing in detail a shape where a door driving assembly of FIG. 2 is coupled to a slide assembly.

[24]

Mode for the Invention

[25] In the following detailed description of the preferred embodiments, reference is made to the accompanying drawings that form a part hereof, and in which is shown by way of illustration specific preferred embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is understood that other embodiments may be utilized and that logical structural, mechanical, electrical, and chemical changes may be made without departing from the spirit or scope of the invention. To avoid detail not necessary to enable those skilled in the art to practice the invention, the description may omit certain information known to those skilled in the art. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the appended claims.

[26] Hereinafter, a detailed embodiment for implementing the idea of the present invention will be described with reference to the accompanying drawings.

- [27] FIG. 1 is a diagram showing a refrigerator according to an exemplary embodiment of the present invention.
- [28] Referring to FIG. 1, an external appearance of a refrigerator 1 according to an embodiment of the present invention is formed by a main body 10 and the inside of the main body 10 is provided with a storage space storing foods at low temperature.
- [29] The storage space includes at least one of a refrigerating chamber 11 that stores foods at low temperature and a freezing chamber 12 that freezes and stores foods.
- [30] In the present embodiment, a refrigerator in a shape where the refrigerating chamber 11 is disposed on the upper side of the main body 10 and the freezing chamber 12 is disposed on the lower side of the main body 10 will be described as an example.
- [31] The refrigerating chamber 11 is selectively opened and closed by a refrigerating chamber door 15. The refrigerating chamber door 15 can be rotatably coupled to the front surface of the main body 10 and the front surface of the refrigerating chamber door can be formed with a handle 151 that can be held by a user.
- [32] The freezing chamber 12 is selectively opened and closed by freezing chamber doors 17 and 19. The freezing chamber 12 is partitioned into two spaces according to the user demand, which can be independently used. The present embodiment will describe this as an example. In this case, the refrigerating doors 17 and 19 includes the upper door 17 that opens and closes the upper space of the freezing chamber 12 and the lower door 19 that opens and closes the lower space.
- [33] At this time, the upper door 17 is formed to be slidably drawn in and out to open and close the upper space of the freezing chamber 12. On the rear side of the upper door 17, a receiving box 175 that can receive foods can be attached and detached to and from a slide assembly (30 of FIG. 2) that moves the upper door 17 forward and backward or a rail connector 34 that is coupled to the slide assembly 30 and the receiving box 175 is drawn in and out together with the upper door 17. Further, the front surface of the upper door 17 may be further formed with a handle 171 that can be held by the user and move the upper door 17.
- [34] The upper door 17 can be slidably drawn in and out manually by the operation that the user holds the handle 171 and pulls and pushes it and can be slidably drawn in and out automatically by the order of the user through a predetermined input unit.
- [35] The lower door 18 can be slidably moved likewise the upper door 17, making it possible to open and close the lower space of the freezing chamber 12. In addition, opening and closing the freezing chamber 12 by two doors is by way of example only and the freezing chamber 12 can be opened and closed by one upper door.
- [36] Meanwhile, one side of the refrigerating chamber door 15 may be provided with a dispenser 20. The dispenser 20 includes a dispensing unit 21 that can dispense water or ice and an operation unit 22 that is formed at one side of the dispensing unit 21. The

operation unit 22 may include a display device 221 that can display the operation state of the dispenser 20 or the refrigerator 1 and a plurality of buttons that can control the operations of the dispenser 20, the refrigerator 1, etc.

[37] The operation unit 22 further includes an input unit 222 that can input the sliding drawing in and out order of the upper door 17. The input unit 222 may be provided in various types, such as a capacitance switch that uses a change in capacitance, a generally widely used tact switch, a toggle switch, etc. and may be provided as a user voice recognizing device, a sound recognizing device, a light sensing device, etc.

[38] In addition, the input unit 222 may be provided at the dispenser 20 or the operation unit 22, but is not limited thereto. The input unit 222 can be independently provided at the front surfaces or side surfaces of the doors 15, 17, and 19.

[39] As one example, the input unit 222 is provided at one side of the front surface of the door that will be automatically opened and may be a vibration sensing switch that is operated to sense vibration transferred to the door that will be automatically opened.

[40] In other words, when applying a weak impact to the door using the user's foot in the state where the user cannot use his/her both hands, the vibration sensing unit senses vibration transferred from the impact, such that the door can be slidably drawn in and out.

[41] Moreover, the input unit 222 is provided in a single button so that it can be provided to receive all the drawing in and out order of the upper door 17 and a button receiving the drawing out order and a button receiving the drawing in order can be independently provided. For example, in the case where the input unit 222 is provided in a single button, the input unit 222 may be configured so that the button is pressed when the upper door 17 is drawn in, it is determined to be the drawing out order and the button is pressed when the upper door 17 is drawn out, it is determined to be the drawing in order.

[42] In this case, if the button is pressed during the movement of the upper door 17 or the button is continuously pressed for a predetermined time, it may be determined to be a stop order. In other words, it can be determined what order the user inputs by the pressing frequency and pressing time of the input unit 222.

[43] Meanwhile, a machine room (not shown) components that are partitioned from the storage space and generate cool air supplied to the storage space is provided at one side of the main body. The machine room may include a compressor that compresses refrigerant at high temperature and high pressure, a condenser that condenses the refrigerant supplied from the compressor, an expanding unit that expands the refrigerant supplied from the condenser to lower the pressure. The refrigerant passing through the expanding unit is supplied to an evaporator that is provided at one side of the storage space, which exchanges heat with air circulating the storage space. In other words, the

air circulating the storage space is deprived of heat to the refrigerant passing through the evaporator and becomes cool air in a low temperature state.

[44] Hereinafter, a detailed configuration that slidably draws in and out the upper door 17 will be described with reference to the drawings.

[45] FIG. 2 is a diagram showing a shape where the upper door of FIG. 1 is drawn out, FIG. 3 is an exploded perspective view of the upper door of FIG. 2, and FIG. 4 is an exploded perspective view showing in detail a shape where a door driving assembly of FIG. 2 is a slide assembly.

[46] Referring to FIGS. 2 to 4, the upper door 17 is configured to connect to a slide assembly 30 and open and close the upper side space of the freezing chamber 12.

[47] In detail, the slide assembly 30 is fixed to a side wall of the freezing chamber 12 and the slide assembly 30 is connected with the rail connector 34 that is fixed to the upper door 17.

[48] Therefore, the upper door 17 moves forward and backward according to the sliding movement of the slide assembly 30.

[49] The receiving box 175 can removably coupled to the slide assembly 30 or the rail connector 34.

[50] In the present embodiment, an example that the receiving box 175 is connected to the rail connector 34 will be described.

[51] In detail, the slide assembly 30 includes a rail guide 31 that is fixedly mounted on the inner wall of the freezing chamber 12, a fixing rail 32 that is coupled to the rail guide 31, and a moving rail 33 that is slidably coupled to the fixing rail 32. The moving rail 33 is coupled to the rail connector 34 that is coupled to the rear surface of the upper door 17.

[52] The rail guide 31 is provided at both side walls of the freezing chamber 12, respectively, and is formed to be extended in a direction where the upper door 17 is drawn in and out. In other words, the rail guide 31 is formed to be extended in the front and rear direction of the refrigerator 1. The rail guide 31 can be firmly coupled to the inner side wall of the freezing chamber 12 by a bolt, etc., so that upper door 17 can be stably drawn in and out.

[53] A rack 315 that guides the movement of a pinion 52 to be described below is formed at a lower end of the rail guide 31.

[54] The rack 315 can be formed to be protruded by a predetermined length from the lower end of the rail guide 31 so that the pinion can be seated. In addition, the rack 315 can be straightly formed so that the central portion of the pinion 52 can be straightly moved and the rack 315 can be extended from the rear end of the freezing chamber 12 to the front end thereof. In addition, the upper end of the rail guide is curved in the inner direction of the freezing chamber 12 and forms a supporting part 311 that

supports the seating part 341 of the rail connector 34.

- [55] The fixing rail 32 is coupled to the space between the rack 315 and the supporting unit 311. The fixing rail 32 is formed with a guide part 323 to guide the sliding movement of the moving rail 33. The guide part 323 is configured of an upper side guide and a lower side guide that are protrudably formed to be spaced by a length corresponding to an upper and lower width of the moving rail 33 and the guides are curved facing each other and can be extended by a predetermined length so that the moving rail 33 is not separated during the sliding movement. In other words, the guides can be formed to perform a role of holding the upper side and lower side of the moving rail 33, respectively. In addition, the guide part 323 can be formed in parallel with the rack 315 so that the moving rail 33 is smoothly moved linearly. In addition, the fixing rail 32 can also be firmly coupled to the guide rail 31 by a bolt, etc., so that upper door 17 can be stably drawn in and out.
- [56] The moving rail 33 is slidably connected to the fixing rail 32. The moving rail 33 is formed to correspond to the upper and lower widths of the guide part 323 and is formed in a long plate shape in a front and rear direction. The upper end and lower end of the moving rail 33 are formed to correspond to the shape of the guide part 323 and is seated to the guide part 323 to be slid forward and backward so that they can be smoothly slid. The moving rail 33 is formed with an insertion part 333 in which a hooking ring 345 to be described below is inserted. The inserting part 333 is formed to be protruded by a predetermined length in an inner direction of the freezing chamber 12 to form a groove in which the hooking ring 345 can be inserted.
- [57] In addition, the rear end of the moving rail 33 is provided with a bracket 56 on which a driving motor 51 to be described below is fixedly mounted. The bracket 56 is formed at a point that is spaced by a predetermined distance in a rear direction from the inserting part 333. In other words, the bracket 56 is provided at a further rear side than the inserting part 333. The bracket 56 may be formed with a plurality of bolting holes 561 to engage the driving motor 51 and the bracket 56 is fixedly mounted on the moving rail 33 by a rivet, a bolt, etc.
- [58] A pinion supporting part to which the pinion 52 is coupled may also be provided at the moving rail 335. The pinion supporting part 335 is formed at one side of the bracket 56 and is provided to be spaced by a predetermined distance from the bracket 56 so that it can be communicated with the driving motor 51. Of course, the pinion supporting unit 335 may be formed integrally with the bracket 56. In the present embodiment, an example that the pinion supporting part 335 is provided at a rear side of the bracket 56 will be described. The pinion supporting part 335 can be provided with predetermined grooves in which the pinion 52 can be inserted to be rotated.
- [59] The moving rail 335 as described above is the configuration that substantially moves

in the slide assembly 30 so that it may also be referred to as a moving part.

- [60] At this time, the fixing rail 32 can be slidably formed like the moving rail 33. In other words, the rail guide 31 is provided with a guide part for moving the fixing rail 32 and the fixing rail can be slidably coupled to the guide part. In other words, the upper door 17 may be provided in a multi-stage drawing out structure.
- [61] The moving rail 33 is coupled with the rail connector 34. The front end of the rail connector 34 is curved in a direction parallel with the rear surface of the upper door 17 so that it is coupled with the rear surface of the upper door 17. At this time, a door liner 172 that is protrudably formed along an edge of the upper door 17 is provided at the rear surface of the upper door 17 and the rail connector 34 can be coupled to the inner side of the door liner 172. Therefore, when the moving rail 33 is slid, the upper door 17 is also slid and the upper side space of the freezing chamber 12 can be selectively opened and closed. The upper end of the rail connector 34 is curved in the inner side direction of the freezing chamber 12 to form a seating part 341 that seats the supporting part 311. The seating part 341 is seated to the supporting part 311 and moved, so that the weight of foods stored in the receiving box 175 is dispersed, making it possible to more stably operate the slide assembly 30.
- [62] The hooking ring 345 is provided at one side of the lower end of the rail connector 34. The hooking ring 345 is formed at a position corresponding to the inserting part 333 and is formed in a hook shape, so that it is inserted into the groove of the inserting part 333. Further, other side of the lower end of the rail connector 34 can be coupled to the moving rail 33 by a bolt. Therefore, when the refrigerator 1 needs to separate the upper door 17 such as passing through a narrow door, the bolt coupling of the rail connector 34 and the moving rail 33 is released and both the upper door 17 and the rail connector 34 can be separated from the refrigerator only by the operation of releasing the hooking ring 345 inserted into the inserting part 333.
- [63] Further, the seating part 341 can be formed with a receiving box fixing groove 347 that removably fixes the receiving box 175. The receiving box 175 can be directly inserted in the receiving box fixing groove 347 and can be inserted in the fixing groove 347 through separate fixing member.
- [64] Meanwhile, a gasket 177 surrounds the outside of the door liner 172. The gasket 177 is close adhered to the main body 10 to block the communication between the inside and outside of the freezing chamber 12 when the upper door 17 is closed. The gasket 177 completely seals the inside of the freezing chamber 12 and is formed of soft materials such as silicon, rubber, etc., to absorb impact when the upper door 17 is closed.
- [65] The structure of the above slide assembly 30 can be identically applied to both sides of the freezing chamber 12 so that the upper door 17 can be smoothly drawn in and out

and the bracket 56 can be provided only to any one moving rail 33. In other words, the driving motor 51 can be coupled to only any one slide assembly.

- [66] Meanwhile, the driving motor 51 that provides driving force moving the moving rail 33 forward and backward is coupled to the bracket 56. In other words, the driving motor 51 moves together with the moving rail 33 forward and backward. The driving motor 51 is surrounded by a motor housing 511 and a first rotational shaft 513a and a second rotational shaft 513b are each protruded to both sides of the housing 511. The first rotational shaft 513a is connected to the connection part 55 to be described below and the second rotational shaft 513b is connected to the pinion 52. At this time, the rotational shafts 513a and 513b are positioned on the same line. The driving motor 51 can be operated so that the rotational shafts 513a and 513b can be rotated at the same time and the rotational shafts 513a and 513b can be configured of a single shaft.
- [67] The motor housing 511 is provided with a flange 515 that fixes the driving motor 51 to the moving rail 33. The flange 515 is fixed to the bracket 56 by a bolt, etc. To this end, the flange 515 can be formed with a plurality of bolting holes. Further, the flange 515 is formed so that the pinion 52 inserted in the second rotational shaft 513b can be connected to the pinion supporting part 335. In other words, the flange 515 is extended by a predetermined length from the housing 511 so that when it is fixed to the bracket 56, the center of the pinion 52 is formed to be rotatably connected to the pinion supporting part 335. Therefore, when the driving motor 51 is coupled to the bracket 56, the center of the pinion supporting part 335, the center of the pinion 52, and the first rotational shaft 513a are disposed on the same axis. Herein, the driving motor 51 is fixed to the moving rail 33 by the coupling of the flange 515 and the bracket 56, such that the pinion supporting part 335 may be removed.
- [68] In addition, when the pinion 52 is inserted into the pinion supporting part 335, it is formed at a size where it can be communicated with the rack 315. In other words, the pinion 52 moves along the rack 315. Herein, since the pinion 52 transfers the rotational force of the driving motor 51, it may be referred to as a rotational force transferring member and since the rack 315 guides the movement of the rotational force transferring member, it may be referred to as a guide member.
- [69] The rotational shaft 513a is connected to a shaft 54 through the connection part 55. In detail, one side of the connection part 55 is formed with grooves corresponding to the shape of the first rotational shaft 513a and other side thereof is formed with grooves corresponding to the shape of the shaft 54. One side of the connection part 55 is inserted with the first rotational shaft 513a and other side thereof is inserted with the shaft 54, so that the rotation of the rotational shaft 513a is transferred to the shaft 54. The shaft 54 can be fixed to the connection part 55 by a bolt, etc.
- [70] The shaft 54 is formed to be traverse the freezing chamber 12 and one side thereof is

connected to the connection part 55 and other side thereof is directly connected to the pinion 53. The pinion 53 is connected to the pinion supporting part of the slide assembly on a side on which the pinion 53 is provided, such that it can be rotated. Therefore, when the rotational shafts 513 and 513b are rotated by the driving motor 51, such that the pinions 52 and 53 on both sides are rotated at the same rotational speed.

[71] At this time, the driving motor 51, the shaft 54, and the pinions 52 and 53 are a driving unit that slidably moves the slide assembly 30 or the upper door 17 and may be referred to a door driving assembly. Herein, the door driving assembly should include at least the driving motor 51 and the pinion 52.

[72] Meanwhile, the driving motor 51 is provided at the rear end of the moving rail 33, such that it can be interfered at the rear wall surface of the freezing chamber 12 in the state where the upper door 17 is completely closed. In order to prevent this, the driving motor may be inclinedly formed to correspond to the shape of the rear wall of the freezing chamber.

[73] Hereinafter, the operation of the refrigerator 1 according to the embodiment of the present invention having the above configuration will be described.

[74] If the user inputs the drawing in or out order of the upper door through the input unit 222, power is applied to the driving motor 51, such that the rotational shafts 513a and 513b are rotated.

[75] If the drawing out order is input by the input unit 222, power is applied to the driving motor 51 so that the rotational shafts 513a and 513b is rotated forward (clockwise direction in FIG. 3). As a result, the pinions 52 and 53 are rotated clockwise and moved along the rack 315 forward. Therefore, the moving rail 33 to which the driving motor 51 is coupled moves forward. At this time, the moving rail 33 is slidably moved according to the guide of the guide part 323. The rail connector 34 is fixed to the moving rail 33, such that receiving box 175 and the upper door 17 move together. In other words, the upper side space of the freezing chamber 12 is opened and the user can receive foods in the receiving box 175.

[76] If the drawing in order is input by the input unit 222, power is applied to the driving motor 51 so that the rotational shafts 513a and 513b is rotated reversely (anticlockwise direction in FIG. 2). As a result, the pinions 52 and 53 are rotated anticlockwise and moved along the rack 315 backward. Therefore, the moving rail moves backward and the upper door 17 closes the upper side space of the freezing chamber 12.

[77] As described above, with the refrigerator 1 according to the embodiment of the present invention, the receiving box 175 is automatically drawn in and out together with the upper door 17 by operating only the input unit 222 that inputs the door drawing in and out order by the user. The use convenience of old people or children is improved.

- [78] In addition, since the receiving box is automatically drawn out, the receiving box can conveniently be drawn out regardless of the weight of foods received in the receiving box 175.
- [79] In addition, the driving motor 51 is not fixedly mounted on the main body 10 and is movably provided together with the receiving box 175, such that the disadvantage of the reduction in the volume of the inside of the refrigerator is removed.
- [80] In addition, the driving motor 51 is not fixedly mounted on the main body 10 and is movably provided together with the receiving box 175, such that the disadvantage of the reduction in the heat shield effect due to the reduction in the heat shield layer of the main body 10 is removed.
- [81] Moreover, when the receiving box 175 can automatically be drawn in and out continuously, the driving motor 51 is movably provided together with the receiving box 175, making it possible to sufficiently use the space between continued receiving boxes.
- [82] Further, the driving motor 51 is not directly connected to the component directly connected to the upper door 17, that is, to the rail connector 34 and indirectly connected through the moving rail 33, making it possible to conveniently attach and detach the upper door 17 if necessary.
- [83] Further, the guide that guides the movement of the receiving box 175 is not subjected to the restriction of the machine room and can be formed to be sufficiently long in the front and rear direction of the main body and the upper door 17 and the receiving box 175 can be sufficiently drawn out, such that the user can conveniently receive foods in the inner space of the receiving box 175.
- [84] The scope of the present invention is not limited to the embodiment set forth herein, but modification, adding and removing can be made in the present invention without departing from the spirit and scope of the invention.

Claims

- [Claim 1] A refrigerator, comprising:
a main body that has a storage space storing foods at low temperature;
a compressor that is provided at one side of the main body to compress refrigerant;
a condenser that condenses the refrigerant compressed in the compressor;
an expanding unit that lowers the pressure of the refrigerant condensed in the condenser;
an evaporator that exchanges heat between the refrigerant passing through the expanding unit and air to generate cool air;
a door that selectively opens and closes the storage space;
a receiving box that is provided in the rear of the door and is drawn in and out together with the door;
a slide assembly that is provided at a side wall of the storage space so that at least its portion can be drawn out to guide a forward and backward movement of the door;
a driving assembly that is mounted on the slide assembly to provide a driving force for allowing the door to move; and
a rail connector that is fixed to a rear surface of the door and is connected detachably to the slide assembly,
wherein the driving assembly is connected to the slide assembly to move together with the door.
- [Claim 2] The refrigerator according to claim 1, wherein the slide assembly includes:
a rail guide that is fixed to the side wall of the storage space; and
a moving rail that is movable along the rail guide and has the rail connector connected thereto, the driving assembly being connected to the moving rail.
- [Claim 3] The refrigerator according to claim 2, wherein the moving rail is provided with a bracket to which the driving assembly is fixedly mounted and a flange coupled to the bracket is extended in the driving assembly.
- [Claim 4] The refrigerator according to claim 3, wherein the rail connector is coupled to the moving rail in front of the bracket.
- [Claim 5] The refrigerator according to claim 1, wherein the slide assembly includes a guide member that is extended forward and backward, and

the driving assembly includes a driving motor and a rotational force transferring member that is connected to the driving motor, the rotational force transferring member being contacted to the guide member to move.

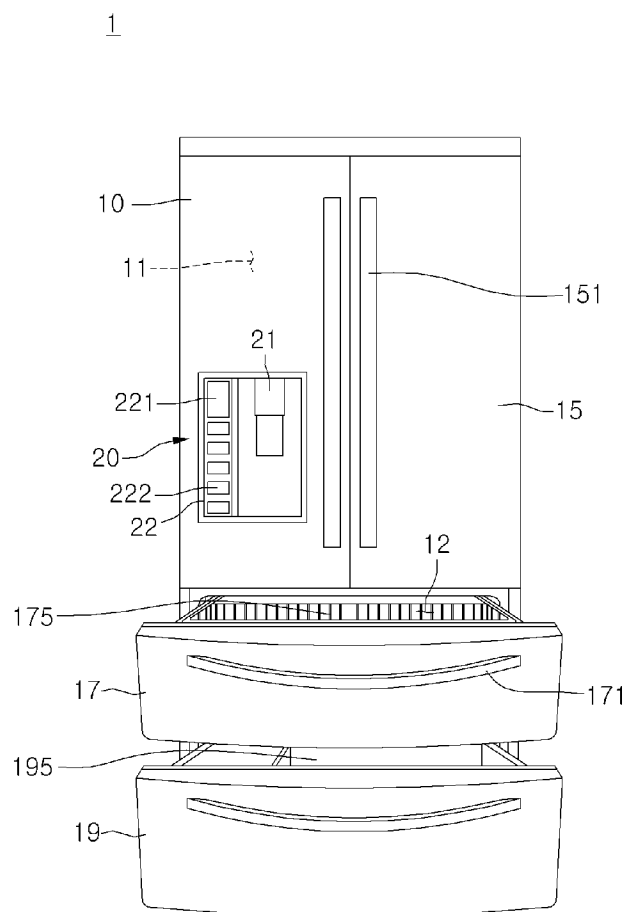
- [Claim 6] The refrigerator according to claim 5, wherein one side of the rotational force transferring member is supported by a rear end of the slide assembly.
- [Claim 7] The refrigerator according to claim 5, wherein the rotational force transferring member is a pinion and the guide member is a rack.
- [Claim 8] The refrigerator according to claim 7, wherein the rack and the pinion are provided at both side walls of the storage space, respectively, the pinions that are provided on both side walls are connected to shafts to be rotated at the same speed.
- [Claim 9] The refrigerator according to claim 1, wherein the receiving box is connected detachably to the rail connector.
- [Claim 10] The refrigerator according to claim 1, further comprising:
an input unit that is provided on the main body or the door to receive at least one order of a drawing in and out orders of the door.
- [Claim 11] The refrigerator according to claim 10, wherein the input unit is provided in a single button that a drawing in or out order is determined depending on press frequency or press time.
- [Claim 12] The refrigerator according to claim 10, wherein the input unit is provided in any one of a capacitance switch, a tact switch, a toggle switch, a user voice recognizing device, a sound recognizing device, and a light sensing device.
- [Claim 13] A refrigerator, comprising:
a main body whose front is opened;
an evaporator that is provided at one side of the main body to generate cool air supplied to an inside of the main body;
a slide assembly that is provided at an inner wall of the main body so that at least its moving part can be slidingly drawn out forward;
a rail connector that is connected to the moving part to be drawn out forward together;
a door that is connected to a front end of the rail connector and selectively opens and closes an opening portion of the main body; and
a driving assembly that is mounted on the moving part to provide a driving force for allowing the moving part to be slid.
- [Claim 14] The refrigerator according to claim 13, wherein the moving part is

provided with a bracket into which the rail connector is detachably inserted and mounted, and the driving assembly is coupled to a rear side of the bracket.

[Claim 15] The refrigerator according to claim 13, wherein the slide assemblies are provided on both sides of the main body and the driving assembly is provided on only any one of the slide assemblies on both sides.

[Claim 16] The refrigerator according to claim 15, wherein a rotating body that is connected to the driving assembly and is rotated together with a rotational force transferring member that is provided to the driving assembly is connected to the other of the slide assemblies.

[Fig. 1]



[Fig. 2]

