

REFRIGERATOR

Technical Field

[0001] The present invention relates to a refrigerator mounting an automatic ice
5 making device and a water supply device to the automatic ice making device.

Background Art

[0002] In a conventional water supply device of an automatic ice making device
mounted on the refrigerator, for instance, a water supplying tank and the automatic ice
10 making device are respectively arranged at a refrigerating chamber and a freezing
chamber which are partitioned with a partitioning wall. A water supplying pump is
composed of a pump unit in which an impeller, arranged at the bottom part of the water
supplying tank, is capable to rotate by the magnetic attractive force, and a motor part
provided facing the pump unit outside of the water supplying tank and rotating the
15 impeller by the magnetic attractive force. A water supply route through which water is
supplied by the water supplying pump from the water supplying tank is provided at the
rear side of outside of the water supplying tank.

[0003] An ice making tray is provided in a freezing chamber, and water for making ice
fed through a water supplying pipe is supplied through an opening part of a heat
20 insulating partition wall. The ice making tray is provided with an ice removing
mechanism; when the ice making is completed, the ice making tray is reversely rotated
by the ice removing mechanism, and the ice making tray is further twisted to remove
the ice. Below the ice making tray, an ice storing case is provided, in which the fallen
ice is reserved.

25 [0004] The water supplying tank includes a vertical transparent container-type

tank and a tank lid which closes an opening part of the top surface of the tank; the tank lid is provided with an impeller part which rotates by the magnetic attractive force of a motor part, and a water supply piping which distributes the water for making ice pumped up from the impeller part is formed as one body.

- 5 The water for making ice discharged from the water supply piping is supplied to the ice making tray through the water supplying pipe.

[0005] In the above structure, by rotating the motor part for a predetermined time, the water necessary for making ice is supplied to the ice making tray, and when the ice making is completed, the ice formed in the ice making tray is fallen down by an ice
10 removing operation and reserved in the ice storing case. Thereafter, the operation being the same as the above is repeated to automatically carry out the ice making operation (for instance, refer to Patent Literature 1).

Citation List

- 15 Patent Literature

[0006] Patent Literature 1: JP3541147B

Summary of Invention

Technical Problem

- 20 [0007] However, the structure such as the conventional water supply device has the following troubles.

(1) First, the water supplying pipe to the ice making tray from the water supplying tank is provided fixedly, which is not a structure to be cleaned.

- (2) Further, since the water supply route is provided at the tank lid, in case of cleaning,
25 it is not easy to clean with general cleaning tools such as brushes, and contamination in

the water supply route cannot be cleaned completely.

(3) Further, in the structure of the conventional water supply device, the water supply route is long, and cleaning cannot be easily done.

[0008] The present invention is provided to solve the above problems; a refrigerator
5 having an automatic ice making device which will be shown in the following is provided:

(1) All the water supply route can be cleaned.

(2) A water supplying tank and a water supply route can be easily attached/detached.

(3) The water supply route is shortened, and thereby cleaning can be done more easily.

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Solution to Problem

[0009] According to the present invention, in a refrigerator provided with a water supply device at a refrigerating chamber and an automatic ice making device at an ice making chamber formed below the refrigerating chamber through a heat insulating
15 partition wall,

the water supply device includes:

(1) a water supplying tank reserving water;

(2) a water supplying pump unit provided inside of the water supplying tank,

having a water supply pump part and a water supplying pipe which is a passage of water
20 for making ice discharged from the water supply pump part;

(3) a driving part provided outside of the water supplying tank, and driving an impeller part of the water supply pump part without contact;

(4) a water supply piping provided inside of the water supplying tank, connecting the water supplying pipe, and as well having a discharge opening so as to

25 face a through hole formed on the heat insulating partition wall;

(5) a water receiving part receiving water from the water supply piping;

(6) a discharge pipe provided at an edge of the water receiving part, having a discharge opening of the water receiving part so as to face the automatic ice making device;

5 (7) a pipe packing sealing the water receiving part and the discharge pipe; and

(8) an electric component retaining member retaining the driving part, and as well retaining the water receiving part to which the discharge pipe is fitted through the pipe packing, and

the water supplying tank is detachably attached to the refrigerating chamber so
10 as to slide in a back and forth direction of the refrigerating chamber, and the water receiving part to which the discharge pipe is fitted through the pipe packing is detachably retained by the electric component retaining member.

Advantageous Effects of Invention

15 [0010] In the refrigerator according to the present invention, all components of the water supply device except the driving part are removable; they can be removed and cleaned, and thus a fear of hygiene of the user can be dispelled.

Brief Description of Drawings

20 [0011] Fig. 1 shows the first embodiment, which is a front elevation view of the refrigerator 100.

Fig. 2 shows the first embodiment, which is a longitudinal sectional view of the refrigerator 100.

Fig. 3 shows the first embodiment, a partial transverse sectional view of a
25 refrigerating chamber, viewing around the water supply device 60 from the above.

Fig. 4 is an A-A cross-sectional view of Fig. 3.

Fig. 5 is a B-B cross-sectional view of Fig. 3.

Fig. 6 shows the first embodiment, which is a cross-sectional view of a water supplying tank 61 pulled out from the refrigerating chamber.

5 Fig. 7 shows the first embodiment and is an enlarged cross-sectional view around the first heat insulating partition wall 80a

Fig. 8 is an enlarged view of a part of C of Fig. 4.

Fig. 9 shows the first embodiment, which is an exploded view of a water receiving member receiving water from a water supply piping 61b.

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Description of Embodiments

[0012] Embodiment 1.

A refrigerator of the present embodiment is characterized to include a water supply device to supply water to an automatic ice making device like the following:

15 (1) a whole water supply route (a water supply route to an ice making tray from a water supplying tank) can be cleaned;

(2) the water supplying tank or the water supply route can be easily attached/detached; and

(3) by shortening the water supply route, cleaning the water supply route can
20 be done more easily.

Before explaining the water supply device of the subject, an example of the structure of the refrigerator will be explained first.

[0013] Figs. 1 and 2 show the first embodiment: Fig. 1 is a front elevation view of a refrigerator 100; and Fig. 2 is a longitudinal sectional view of the refrigerator 100.

25 With reference to Figs. 1 and 2, the structure of the refrigerator 100 will be explained.

[0014] As shown in Fig. 1, the refrigerator 100 has plural chambers; a refrigerating chamber, an ice making chamber and a switching chamber placed side-by-side, a freezing chamber, and a vegetable chamber are formed, in an order from the above. At a front opening part of the refrigerating chamber, a rotary refrigerating chamber door (left) 10a and a rotary refrigerating chamber door (right) 10b (what is called, side-by-side double doors) are provided so as to freely open/close. The horizontal width of the refrigerating chamber door (left) 10a is shorter than the one of the refrigerating chamber door (right) 10b. The horizontal width of the refrigerating chamber door (left) 10a is set to be almost the same as the horizontal width of an ice making chamber door 20, which will be discussed later. In this case, the horizontal width of the refrigerating chamber door (right) 10b is almost the same as the horizontal width of a switching chamber door 30, which will be discussed later.

[0015] A front opening part of the ice making chamber is covered by the ice making chamber door 20 which is a drawer type so as to freely open/close. To the drawer-type ice making chamber door 20, a frame 20b mounting an ice storing case 20a is fixed (refer to Fig. 2).

[0016] A front opening part of the switching chamber is covered by a drawer-type switching chamber door 30 so as to freely open/close. The inside of the drawer-type switching chamber door 30 is a storage chamber having an opening at the top surface.

[0017] A front opening part of the freezing chamber is covered by a drawer-type freezing chamber door 40 so as to freely open/close.

[0018] A front opening part of the vegetable chamber is covered by a drawer-type vegetable chamber door 50 so as to freely open/close.

[0019] As shown in Fig. 2, the refrigerator 100 is formed by an outer box made of steel plate and an inner box made of resin having heat insulating material filled in

between, including a box-like main body 101 (a heat insulated box body) having an opening part which opens at one surface (the front surface). The inside of the main body 101 is partitioned into plural chambers by the heat insulating partition wall which will be shown in the following.

5 [0020] The refrigerating chamber and the ice making and switching chambers are partitioned by a first heat insulating partition wall 80a having the heat insulating property. At the first heat insulating partition wall 80a, a through hole 80a-5 (refer to Fig. 4) is opened for placing a discharge pipe 94 (refer to Figs. 8 and 9) of a water supply device 60, which will be discussed later. Water fed from a water supplying
10 tank 61 (refer to Fig. 6) is supplied from the discharge pipe 94 to an automatic ice making device 70.

[0021] The ice making and switching chambers and the freezing chamber are partitioned by a second heat insulating partition wall 80b having the heat insulating property.

15 [0022] The freezing chamber and the vegetable chamber are partitioned by a third heat insulating partition wall 80c having the heat insulating property.

[0023] Plural shelves are provided inside of the refrigerating chamber so as to store foods at multiple stages. At the upper part of the ice making chamber, an ice making tray and an ice removing mechanism which form an automatic ice making device 70 are
20 provided. Water is supplied to the ice making tray through the through hole 80a-5 (refer to Fig. 4, an opening part for water supply) opened at the first heat insulating partition wall 80a from the water supply device 60, which will be discussed later.

When the fact that the water reserved in the ice making tray is frozen is detected, the ice removing mechanism carries out an ice removing operation by twisting the ice making
25 tray so as to turn upside down, and thereby the ice falls down and is reserved in an ice

storing case 20a.

[0024] At the lower part of the refrigerating chamber, the water supply device 60 (a detail will be discussed later) is provided. Further, the ice making chamber is provided with an automatic ice making device 70 to which water is supplied from the water

5 supply device 60 for ice making. The present embodiment is characterized in the structure of the water supply device 60. Although a detail will be discussed later, the user can pull the water supplying tank 61 (refer to Fig. 6) which forms the water supply device 60 to the outside, and can wash the tank. Further, a water receiving part 92 and the discharge pipe 94 (refer to Figs. 8 and 9, for both) which are placed farer from the
10 water supplying tank 61 can also be removed easily and can be washed.

[0025] Since the other structure is the same as a general refrigerator, only an outline will be explained. Cold air is generated by the refrigeration cycle using a compressor (for instance, a reciprocating compressor) for compressing the refrigerant, and each storage chamber is cooled down by the cold air. The compressor is provided at the
15 machine chamber (outside of the main body 101) around the bottom part of the refrigerator 100. The high-temperature and high-pressure refrigerant gas compressed by the compressor is cooled down by the condenser to become high-pressure liquid refrigerant, and further, is depressurized by a pressure reducing device (normally, a capillary tube) to become low-pressure two-phase refrigerant. The low-pressure
20 two-phase refrigerant cools down each storage chamber of the refrigerator 100 using an evaporator (a cooler), thereby becoming low-pressure gas refrigerant, and returning to the compressor. This cycle is repeated.

[0026] The refrigerator 100 is provided with a cooling chamber having at least a cooler and an air blower at, for instance, the back surface of the freezing chamber. By
25 the air blower, cold air generated by the cooler is fed to each storage chamber. The

temperature of each storage chamber is adjusted to the preset temperature by controlling the volume of cold air with a damper.

[0027] Figs. 3 to 7 show the first embodiment: Fig. 3 is a partial transverse sectional view around the water supply device 60 of the refrigerating chamber viewing from the
5 above; Fig. 4 is an A-A cross-sectional view of Fig. 3; Fig. 5 is a B-B cross-sectional view of Fig. 3; Fig. 6 is a cross-sectional view of the water supplying tank 61 pulled out from the refrigerating chamber; Fig. 7 is an enlarged cross-sectional view around the first heat insulating partition wall 80a.

[0028] Fig. 3 shows only the left side part of the refrigerating chamber where the
10 water supply device 60 is provided. The water supply device 60 is provided around the left end part of the refrigerating chamber, facing a goods containing pocket 10a-1 of the refrigerating chamber door (left) 10a.

[0029] The water supply device 60 is provided with, though a detail will be discussed later, in a water supplying tank main body 61a, a water supplying pump unit 64 having a
15 water supply pump part 62 and a water supplying pipe 63 which is a passage of water for making ice discharged from the water supply pump part 62, and a water receiving part 92 to which a discharge hole of a water supply piping 61b (refer to Fig. 4), to which the water supplying pipe 63 is connected, is faced, and so on. The water receiving part 92 is provided at an almost intermediate position in the depth direction of the
20 refrigerating chamber. Therefore, in case of detaching the water receiving part 92 for cleaning, hands of the user can easily reach.

[0030] The structure around the water supply device 60 of the refrigerating chamber will be explained with reference to Figs. 4 and 5. The water supply device 60 includes at least the components which will be shown in the following:

25 (1) the water supplying tank 61 to reserve water;

(2) the water supplying pump unit 64 provided in the water supplying tank 61 and having the water supply pump part 62 and the water supplying pipe 63 (silicon rubber) which is the passage of the water for making ice discharged from the water supply pump part 62;

5 (3) a motor part 96 (a driving part) provided outside of the water supplying tank 61 which drives without contact an impeller part 62a (refer to Fig. 6) of the water supply pump part 62;

(4) the water supply piping 61b provided in the water supplying tank 61, to which the water supplying pipe 63 is connected, and as well provided so that the discharge hole
10 faces the through hole 80a-5 formed at the first heat insulating partition wall 80a (an example of the heat insulating partition wall);

(5) the water receiving part 92 (refer to Figs. 8 and 9) which receives the water from the water supply piping 61b;

(6) a tank packing 91(refer to Figs. 8 and 9) which seals the water supply piping 61b
15 and the water receiving part 92;

(7) the discharge pipe 94 (refer to Figs. 8 and 9) provided at the end of the water receiving part 92 so that the tip (the discharge hole) faces the automatic ice making device 70;

(8) a pipe packing 93 (refer to Figs. 8 and 9) which seals the water receiving part 92 and
20 the discharge pipe 94; and

(9) an electric component retaining member 97 (a partitioning plate) retaining the motor part 96 (the driving part) and an antifreeze heater (not shown, provided at an outer circumference of the discharge pipe 94), etc. and the water receiving part 92 to which the discharge pipe 94 is fitted through the pipe packing 93.

25 [0031] The water supplying tank 61 holds the water supplying tank main body 61a

which is a transparent made-of-PS (polystyrene resin) vertical container type and the tank lid 61c which is detachable so as to close the opening part of the top surface of the water supplying tank main body 61a. At the outer circumferential part of the tank lid 61c, a packing 65 is attached, so that the opening part of the water supplying tank main body 61a can be closed firmly by the packing 65.

[0032] The water supplying tank main body 61a of the water supplying tank 61 has a convex shape 61a-1 which is projected downwardly to the bottom part of the rear side (the right side in Fig. 6) of the refrigerating chamber, and the electric component retaining member 97 (the partitioning plate) is provided with a concave section part 97a (refer to Fig. 7, a concave part) which matches the convex shape 61a-1 (refer to Fig. 6) at the position storing the water supplying tank 61.

[0033] As shown in Fig. 6, on the near side of the convex shape 61a-1 in the water supplying tank 61, the convex shape 61a-1 is connected to a bottom part 61a-3 with a gentle slope 61a-2. On the near side of the bottom part 61a-3, a foot part 61d is formed as one body, and in stored status and in pulled-out status, the foot part 61d and the convex shape 61a-1 are at almost the same height, so that the water supplying tank 61 is balanced.

[0034] On the near side of the concave section part 97a of the electric component retaining member 97 (the partitioning plate), a slope 97c which is gently ascending along the slope 61a-2 of the water supplying tank 61 is provided, and as well, on the near side of the slope 97c, a slope 97d which is more gently descending is provided to connect to a flat surface part 97e of the electric component retaining member 97 (the partitioning plate). This flat surface part 97e is formed to have the same height as the concave section part 97a. A part which is projected upwardly to have a peak at a position where the ascending slope 97c is intersected with the descending slope 97d is

defined as a convex section part 97b.

[0035] Further, the water supplying pump unit 64 is fixed to the rear side of the bottom part (the part of the convex shape 61a-1) of the water supplying tank 61. The water supplying pump unit 64 is formed by the water supply pump part 62 and the water
 5 supplying pipe 63 (silicon rubber) which is the passage of the water for making ice discharged from the water supply pump part 62.

[0036] The water supply pump part 62 contains the impeller part 62a to which a disk-shaped magnet is fixed, the impeller is rotated by the motor part 96 (the driving part) provided outside so as to face the impeller part 62a with the magnetic attractive
 10 force. A suction opening 62b is provided at the front surface (the left side in Fig. 6) of the water supply pump part 62. Water of the water supplying tank 61 is sucked from the suction opening 62b and discharged to the side of the water supply piping 61b provided at the water supplying tank 61.

[0037] The water supply piping 61b is formed as one body with the water supplying
 15 tank main body 61a, and has opening parts at the up and down sides. The water supplying pipe 63 is connected to the upper opening part so as to let the water supplied from the water supplying pipe 63 run to the lower opening part. The lower opening part of the water supply piping 61b is provided so as to face the opening part of the top surface of the water receiving part 92.

[0038] Here, the water supply piping 61b can be formed as a separate component from the water supplying tank main body 61a. In case of forming the water supply piping 61b and the water supplying tank main body 61a as one body, since the water supplying tank main body 61a has a complicated shape, the mold for formation should have a complicated structure. However, if the water supply piping 61b is formed as a separate
 20 component from the water supplying tank main body 61a, there is an advantage that the
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mold for forming the water supplying tank main body 61a can be made to have a simpler structure.

[0039] The motor part 96 (the driving part) is provided with a rotation shaft (not shown) in a horizontal direction at the rear side through the partitioning plate (the electric component retaining member 97), and as well a rotating part (not shown) is provided so as to face the impeller part 62a of the water supply pump part 62 of the water supplying tank 61. A magnetic plate is fixed to the rotating part, and the impeller part 62a of the water supply pump part 62 is rotated through the partitioning plate (the electric component retaining member 97) and the wall surface of the water supplying tank 61 using the magnetic attractive force.

[0040] Figs. 8 and 9 show the first embodiment: Fig. 8 is an enlarged view of the C part of Fig. 4; and Fig. 9 is an exploded view of the water receiving member receiving water from the water supply piping 61b.

[0041] When the water supplying tank 61 is placed at a normal position, the lower opening part of the water supply piping 61b of the water supplying tank main body 61a is mounted on the top surface of the water receiving part 92 through a tank packing 91. The tank packing 91 suppresses water leakage from the water supply piping 61b to the inside of the refrigerating chamber.

[0042] The water receiving part 92 has a funnel shape in which the top surface is opened, and the tubular discharge pipe 94 made of aluminum is connected to the lower part. A pipe packing 93 is attached to the connection part of the water receiving part 92 and the discharge pipe 94 so as to firmly close the water receiving part 92 and the discharge pipe 94 to prevent water leakage.

[0043] Since the edge of the discharge pipe 94 faces the ice making chamber, the cold air of the ice making chamber flows from the discharge pipe 94 to the side of the water

supplying tank 61. Therefore, a heater, not shown, is provided around the electric component retaining member 97 covering the outer circumference of the discharge pipe 94 to prevent freezing of the inside of the discharge pipe 94.

[0044] Further, the pipe packing 93 provided at the connection part of the water

5 receiving part 92 and the discharge pipe 94 prevents the leakage of the cold air of the ice making chamber, which flows from the discharge pipe 94 to the side of the water supplying tank 61, to the refrigerating chamber.

[0045] There is little fear that the cold air of the ice making chamber which flows from the discharge pipe 94 to the side of the water supplying tank 61 intrudes to the inside of

10 the water supplying tank 61. It is because water is always reserved around the water supply pump part 62, which shuts off the cold air of the ice making chamber here. It is further because the detachable tank lid 61c is attached so as to close the opening part of the top surface of the water supplying tank main body 61a, the packing 65 is attached to the outer circumferential part of the tank lid 61c, and the opening part of the water
15 supplying tank main body 61a is firmly closed by the packing 65.

[0046] The water receiving part 92 is provided with a handle 92a, and it is structured to easily remove from the near side in case of, for instance, cleaning the water receiving part 92.

[0047] Next, the water supply operation will be discussed. In the automatic ice

20 making operation, when the motor part 96 is driven, the impeller part 62a of the water supply pump part 62 is rotated. Then, the water for making ice inside of the water supplying tank 61 is sucked from the suction opening 62b of the water supply pump part 62, the water for making ice passes through the water supplying pipe 63, runs through the water supply piping 61b, and the water is supplied from the water receiving part 92
25 to the ice making tray through the discharge pipe 94.

[0048] Driving the motor part 96 for the predetermined time causes to supply the predetermined water for making ice to the ice making tray. Thereafter, when the ice making is detected inside of the ice making chamber, the ice removing operation is done by the ice removing mechanism, the ice of the ice making tray falls, and is reserved in the ice storing case 20a (refer to Fig. 2). Hereinafter, the above water supply operation is done.

[0049] Next, a case of cleaning (washing) the water supply device 60 will be explained. When the water supplying tank 61 is cleaned, the water supplying tank 61 is pulled out from the refrigerating chamber using the handle 61e. At this time, in the status as shown in Fig. 6, the water supplying tank 61 is pulled out with the tank packing 91 attached. As for cleaning, the tank lid 61c is removed, the water supplying pump unit 64 (the water supply pump part 62, the water supplying pipe 63) are removed, and cleaning can be done.

[0050] Further, in case of cleaning the discharge pipe 94, by holding and lifting upwardly the handle 92a of the water receiving part 92, the discharge pipe 94 and the water receiving part 92 can be pulled out from the refrigerating chamber at the same time (the water receiving part 92 and the discharge pipe 94 are fixed by the pipe packing 93). By this operation, the discharge pipe 94 and the water receiving part 92 can be cleaned easily.

[0051] At the time of attachment, by holding the handle 92a of the water receiving part 92, the discharge pipe 94 is dropped down so as to insert to the predetermined position (an inserting part of the discharge pipe 94 of the electric component retaining member 97), and the positioning is done at the predetermined position (the through hole 80a-5) of the first heat insulating partition wall 80a.

[0052] As discussed above, since all components of the water supply route (from the

water supplying tank 61 to the discharge pipe 94) can be removed easily, the whole water supply route can be cleaned, and thus it is possible to maintain the hygiene of the water supply device 60.

5 Reference Signs List

[0053] 10a: a refrigerating chamber door (left); 10a-1: a goods storing pocket; 10b: a refrigerating chamber door (right); 20: an ice making chamber door; 20a: an ice storing case; 20b: a frame; 30: a switching chamber door; 40: a freezing chamber door; 50: a vegetable chamber door; 60: a water supply device; 61: a water supplying tank; 61a: a water supplying tank main body; 61a-1: a convex shape; 61a-2: a slope; 61a-3: a bottom part; 61b: a water supply piping; 61c: a tank lid; 61d: a foot part; 61e: a handle; 62: a water supply pump part; 62a: an impeller part; 62b: a suction opening; 63: a water supplying pipe; 64: a water supplying pump unit; 65: a packing; 70: an automatic ice making device; 80a: a first heat insulating partition wall; 80a-5: a through hole; 80b: a second heat insulating partition wall; 80c: a third heat insulating partition wall; 91: a tank packing; 92: a water receiving part; 92a: a handle; 93: a pipe packing; 94: a discharge pipe; 96: a motor part; 97: an electric component retaining member; 97a: a concave section part; 97b: a convex section part; 97c: a slope; 97d: a slope; 97e: a flat surface part; 100: a refrigerator; and 101: a main body.

Claims

1. A refrigerator provided with a water supply device at a refrigerating chamber and an automatic ice making device at an ice making chamber formed below the refrigerating chamber through a heat insulating partition wall,

5 wherein the water supply device comprises:

(1) a water supplying tank reserving water;

(2) a water supplying pump unit provided inside of the water supplying tank, having a water supply pump part and a water supplying pipe which is a passage of water for making ice discharged from the water supply pump part;

10 (3) a driving part provided outside of the water supplying tank, and driving an impeller part of the water supply pump part without contact;

(4) a water supply piping provided inside of the water supplying tank, connecting the water supplying pipe, and as well having a discharge opening so as to face a through hole formed on the heat insulating partition wall;

15 (5) a water receiving part receiving water from the water supply piping;

(6) a discharge pipe provided at an edge of the water receiving part, having a discharge opening of the water receiving part so as to face the automatic ice making device;

(7) a pipe packing sealing the water receiving part and the discharge pipe; and

20 (8) an electric component retaining member retaining the driving part, and as well retaining the water receiving part to which the discharge pipe is fitted through the pipe packing,

wherein the water supplying tank is detachably attached to the refrigerating chamber so as to slide in a back and forth direction of the refrigerating chamber, and the
25 water receiving part to which the discharge pipe is fitted through the pipe packing is

detachably retained by the electric component retaining member.

2. The refrigerator of claim 1, wherein the water receiving part is provided at an almost intermediate position of the refrigerating chamber in a depth direction.

3. The refrigerator of claim 1 or 2, wherein the water supply piping of the water
5 supplying tank is attached to the water supplying tank as a separate component.

4. The refrigerator of one of claims 1 to 3, wherein the water receiving part is provided with a handle.