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(71) Applicant: **LG Electronics, Inc.**
Seoul 150-721 (KR)

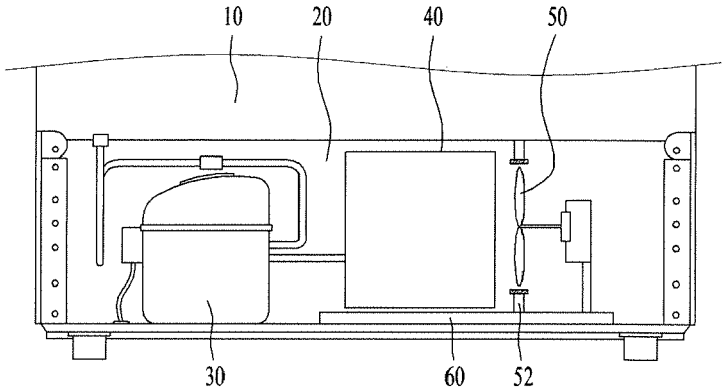
(72) Inventors:
- **Shin, Sangin**
  153-802 Seoul (KR)
- **Lee, Jangseok**
  153-802 Seoul (KR)
- **Jung, Jinho**
  153-802 Seoul (KR)
- **Lee, Namgi**
  153-802 Seoul (KR)

(74) Representative: **Vossius & Partner**
Siebertstrasse 4
81675 München (DE)

(54) Machine room of refrigerator

(57) A machine room of a refrigerator is disclosed. The machine room includes a defrost water tray to collect defrost water, a condenser installed at an upper side of the defrost water tray, an air blowing fan installed at one side of the condenser to generate air flow, and a guide part to guide air supplied from the air blowing fan, wherein the air blowing fan is disposed at an upper side of the defrost water tray, and the guide part is disposed between the condenser and air blowing fan to prevent a portion of the air flow supplied by the air blowing fan from moving to the defrost water tray.

FIG. 1



EP 2 759 790 A2

Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a machine room of a refrigerator that improves the efficiency of a refrigeration cycle.

Discussion of the Related Art

[0002] A refrigerator generally includes a machine room, which is arranged at a lower portion of the refrigerator. The machine room is generally installed at the lower portion of the refrigerator for balanced positioning of the refrigerator, ease of assembly, and reduction of vibration.

[0003] A refrigeration cycle apparatus, installed in the machine room of a refrigerator, maintains the interior of the refrigerator in a frozen/cooled state using a refrigerant which absorbs external heat when changing from liquid to gas state at a low pressure, such that foods are maintained in a fresh state.

[0004] The refrigeration cycle apparatus of the refrigerator includes a compressor to change a refrigerant from a low-temperature, low-pressure gaseous state to a high-temperature, high-pressure gaseous state, a condenser to change the refrigerant changed into the high-temperature, high-pressure gaseous state in the compressor into a low-temperature, high-pressure liquid state, and an evaporator to change the refrigerant changed into the low-temperature, high-pressure liquid state in the condenser into a gaseous state and absorb external heat.

[0005] A cooling fan may be provided in the machine room to cool the condenser. As the condenser is caused to exchange heat with the air by the cooling fan, the refrigerant passing through the condenser may be cooled.

[0006] A majority of the power consumed by the refrigerator is used to drive the refrigeration cycle. Accordingly, research has been conducted into technology that can reduce power consumed in the refrigerators by efficiently implementing the refrigeration cycle.

SUMMARY OF THE INVENTION

[0007] Accordingly, the present invention is directed to a machine room of a refrigerator that substantially obviates one or more problems due to limitations and disadvantages of the related art.

[0008] An object of the present invention is to provide a machine room of a refrigerator that reduces power consumption of the refrigerator by improving the efficiency of refrigeration cycle.

[0009] Another object of the present invention is to provide a machine room of a refrigerator that increases the efficiency of the entire refrigeration cycle by increasing the cooling efficiency of the condenser.

[0010] Additional advantages, objects, and features of the invention will be set forth in part in the description which follows and in part will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objectives and other advantages of the invention may be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

[0011] To achieve these objects and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, a machine room of a refrigerator including a defrost water tray to collect defrost water, a condenser installed at an upper side of the defrost water tray, an air blowing fan installed at one side of the condenser to generate air flow, and a guide part to guide air supplied from the air blowing fan, wherein the air blowing fan is disposed at an upper side of the defrost water tray, and the guide part is disposed between the condenser and air blowing fan to prevent a portion of the air flow supplied by the air blowing fan from moving to the defrost water tray.

[0012] Particularly, the guide part may guide the air flow generated by the air blowing fan such that a larger portion of the air flow is supplied to the condenser than to the defrost water tray.

[0013] In addition, a through surface having a path guiding air to the defrost water tray is arranged between the condenser and the air blowing fan, wherein the guide part closes a portion of the through surface.

[0014] The guide part may obstruct the air supplied by the air blowing fan from passing through the through surface.

[0015] In addition, the guide part may be formed such that a ratio of an area of the guide part to an area of the through surface is between 58% and 100%.

[0016] Further, guide part may be formed such that the ratio of the area of the guide part to the area of the through surface is between 58% and 74%.

[0017] Particularly, the guide part may be formed such that the ratio of the area of the guide part to the area of the through surface is between 64% and 74%.

[0018] Alternatively, the guide part may be formed such that the ratio of the area of the guide part to the area of the through surface is 64%.

[0019] Meanwhile, the guide part may be arranged adjacent to the air blowing fan.

[0020] In addition, the guide part may be arranged adjacent to the condenser.

[0021] In addition, the guide part may be inclined downward while extending away from the condenser.

[0022] The guide part may be disposed spaced a predetermined distance from each of the air blowing fan and the condenser.

[0023] Particularly, a fan guide may be arranged on an outer circumferential surface of the air blowing fan, wherein the fan guide may guide the air flow generated by the air blowing fan in a direction of a rotating shaft of

the air blowing fan.

[0024] In addition, the rotating shaft of the air blowing fan may be parallel with a ground surface and may be directed toward the condenser.

[0025] Meanwhile, a compressor to compress a refrigerant may be arranged at one side of the condenser, wherein the compressor may be cooled by the air flow supplied from the air blowing fan.

[0026] It is to be understood that both the foregoing general description and the following detailed description of the present invention are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principle of the invention. In the drawings:

FIG. 1 is a conceptual view illustrating a machine room of a refrigerator according to one embodiment of the present invention;

FIG. 2 is a conceptual view illustrating one embodiment of the present invention;

FIG. 3 is a view illustrating FIG. 2 in detail;

FIG. 4 is a plan view of FIG. 3;

FIG. 5 is a conceptual view illustrating another embodiment of the present invention;

FIG. 6 is a conceptual view illustrating a variation of the embodiment of FIG. 5;

FIG. 7 is a conceptual view illustrating another embodiment of the present invention; and

FIG. 8 is a graph depicting the effect of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0028] Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

[0029] For simplicity and clarity of illustration, the dimensions and shapes of some of the elements shown in the drawings may be exaggerated. In addition, terms specially defined in consideration of the configuration and operation of the present invention may vary based on intentions of a user and an operator or practices. It should be noted that these terms should be construed based on the whole contents of this specification

[0030] Refrigerators may be classified into top mount type refrigerators, side-by-side type refrigerators, and bottom freezer type refrigerators, according to positions of a refrigeration compartment and a freezer compartment. In top mount type refrigerators, a freezer compartment is disposed over a refrigeration compartment. In side-by-side type refrigerators, a freezer compartment and a refrigeration compartment are disposed side by side. In bottom freezer type refrigerators, a freezer compartment is disposed under a refrigeration compartment.

[0031] The side-by-side type refrigerator has a relatively large capacity and a combination of various functions. The freezer compartment and refrigeration compartment of the side-by-side type refrigerator are vertically installed, forming the left and right sides of the refrigerator. In addition, a machine room in which an evaporator is mounted is provided at the back of the freezer compartment. The machine room suctions the air in freezer compartment and the refrigeration compartment to the lower side, and at the same time discharges the air to an upper side, thereby circulating the air in the refrigerator to perform the refrigeration function and the freezing function.

[0032] The machine room of a refrigerator according to the present invention is applicable to all types of refrigerators described above.

[0033] FIG. 1 is a conceptual view illustrating a machine room of a refrigerator according to one embodiment of the present invention. Hereinafter, a description will be given with reference to FIG. 1. In FIG. 1, a guide part, an element of the present invention is omitted. Various embodiments related to the guide part will be specifically described with reference to other drawings.

[0034] The refrigerator may include a body 10 having a refrigeration compartment and a freezer compartment to store food, and a machine room 20 where a compressor 30 and a condenser 40 are installed.

[0035] As shown in FIG. 1, the machine room 20 may be provided at a lower portion of the body 10 of the refrigerator, or may be provided at the upper side of the refrigerator. The machine room 20 is a space in which various constituents provided to the refrigerator are installed. Unlike the refrigeration compartment or the freezer compartment, the machine room 20 is configured to allow air outside the refrigerator to be freely introduced into or discharged from the refrigerator.

[0036] In the case that the machine room 20 is arranged at the lower portion of the body 10 of the refrigerator, storage compartments such as the refrigeration compartment and the freezer compartment may be arranged at the upper side of the machine room 20. In addition, the evaporator, which supplies cold air to the refrigeration compartment and the freezer compartment may be installed adjacent the refrigeration compartment and the freezer compartment rather than in the machine room 20. The duct guiding the refrigerant to the evaporator may extend beyond the machine room 20 toward the refrigeration compartment and the freezer compartment.

[0037] A plurality of ducts guiding flow of the refrigerant may be installed in the machine room 20 such that the

refrigerant can circulates through the refrigeration cycle. An air blowing fan 50 capable of cooling the compressor 30 and the condenser 40 may be provided in the machine room 20.

[0038] The air blowing fan 50 may be disposed at one side of the compressor 30 and the condenser 40. Thereby, one air blowing fan 50 may cool both the compressor 30 and the condenser 40. That is, when the air blowing fan 50 is driven, the air introduced into the air blowing fan 50 may cause air to flow to the position where the compressor 30 and the condenser 40, thereby cooling the compressor 30 and the condenser 40.

[0039] When frost is formed on the evaporator, heat exchange between the refrigerant passing through the evaporator and external air is not smoothly performed. Accordingly, cold air is not smoothly supplied to the refrigeration compartment or the freezer compartment using the evaporator. Therefore, a defrost heater is arranged adjacent to the evaporator to melt the frost formed on the evaporator. At this time, the defrost water produced as the frost melts falls into the machine room 20. The defrost water may be moved by a means such as a tube that provides a flow path.

[0040] A defrost water tray 60 to capture the produced defrost water is arranged at a lower portion of the machine room 20. The defrost water is accommodated in the defrost water tray 60. The defrost water may naturally evaporate as time passes or be evaporated by air flow generated by the air blowing fan 50. Accordingly, the level of the defrost water accommodated in the defrost water tray 60 is gradually lowered.

[0041] That is, the air blowing fan 50 functions to cool the condenser 40 and the compressor 30 and evaporate the defrost water accommodated in the defrost water tray 60.

[0042] A fan guide 52 is disposed on the outer circumferential surface of the air blowing fan 50 around the blades of the air blowing fan 50. The fan guide 52 directs the generated air flow. The fan guide 52 may guide air flow to the front of the air blowing fan 50, i.e., toward the rotating shaft of the air blowing fan 50.

[0043] A part of the air flow supplied by the air blowing fan 50 is directed to the condenser 40 to cool the condenser 40, and another part of the air flow is directed to the defrost water tray 60 to evaporate the defrost water accommodated in the defrost water tray 60.

[0044] Since both the air blowing fan 50 and the condenser 40 are disposed at the upper side of the defrost water tray 60, the air flow supplied to the defrost water tray 60 may move to the defrost water tray 60 through the passage formed in the space between the air blowing fan 50 and the condenser 40.

[0045] FIG. 2 is a conceptual view illustrating one embodiment of the present invention. Hereinafter, a description will be given with reference to FIG. 2.

[0046] Both the condenser 40 and the air blowing fan 50 are disposed at the upper side of the defrost water tray 60. At this time, the condenser 40 and the air blowing fan 50 are arranged spaced a predetermined distance from each other. Thereby, a part of the air flow generated by the air blowing fan 50 may be guided to the defrost water tray 60 through the space between the condenser 40 and the air blowing fan 50.

[0047] The portion between the condenser 40 and the air blowing fan 50 allowing the air to move therethrough is defined as a through surface 28. Herein, the through surface 28 refers to an empty space connecting the lower end of the condenser 40 to the lower end of the air blowing fan 50. That is, the air flow generated by the air blowing fan 50 has straightness, but it also affects the air positioned therearound. Accordingly, air can move downward through the through surface 28.

[0048] According to this embodiment, a guide part 70 to partially close the through surface 28 is installed. The guide part 70 may prevent a part of the air flow supplied by the air blowing fan 50 from moving to the defrost water tray 60.

[0049] The guide part 70 may have a shape of a rectangular plate having a predetermined thickness, may be formed of acrylonitrile butadiene styrene (ABS) and be arranged adjacent to the fan guide 52. The guide part 70 may be formed to have various shapes, and the thickness thereof may also vary.

[0050] As the guide part 70 is disposed to cover a part of the through surface 28, it may be arranged overlapping the through surface 28.

[0051] Accordingly, as the area of the guide part 70 increases, the portion of the guide part 70 overlapping the through surface 28 increases. On the other hand, as the area of the guide part 70 decreases, the portion of the guide part 70 overlapping the through surface 28 is reduced. In the case that the area of the guide part 70 increases, the guide part 70 covers a large portion of the through surface 28, and thus flow of air moving from the air blowing fan 50 to the defrost water tray 60 is reduced.

[0052] Installed at the air blowing fan 50 are a driving motor 54 to provide rotational force and a rotating shaft 56 to transfer the rotational force of the driving motor 54 to the air blowing fan 50. That is, as the driving motor 54 rotates, the rotating shaft 56 rotates, and the air blowing fan 50 is rotated by the rotating shaft 56.

[0053] The fan guide 52 is disposed on the outer circumferential surface of the blades of the air blowing fan 50, forming a plane having a predetermined length. Thereby, the fan guide 52 may guide the air flow produced by the air blowing fan 50 in the direction of the rotating shaft 56.

[0054] However, the fan guide 52 can control only flow of the air positioned adjacent to the air blowing fan 50, and cannot guide all the air flow generated by the air blowing fan 50 in the direction of the rotating shaft 56.

[0055] Accordingly, in this embodiment, the guide part 70 is provided to guide a larger portion of the air to the condenser 40 rather to the defrost water tray 60 than when the guide part 70 is not installed.

[0056] The defrost water tray 60 is provided with a

space to accommodate a predetermined amount of water. Accordingly, the defrost water does not need to be evaporated by the air blowing fan 50 upon being accommodated in the defrost water tray 60. In addition, the accommodated defrost water can naturally evaporate even when a large amount of air is not supplied by the air blowing fan 50. Accordingly, the amount of the defrost water accommodated in the defrost water tray 60 may be reduced.

[0057] Therefore, in this embodiment, the guide part 70 is provided, thereby allowing a larger amount of the air flow generated by the air blowing fan 50 to be supplied to the condenser 40 rather to the defrost water tray 60. Thereby, efficiency of the refrigeration cycle may be improved.

[0058] When a large amount of air flow is supplied to the condenser 40 by the air blowing fan 50, the condenser 40 exchanges a large amount of heat with the external air. The refrigerant passing through the condenser 40 may be cooled by exchanging a large amount of heat, and thus the refrigerant may be introduced into the evaporator at a lowered temperature. Accordingly, the efficiency of refrigeration cycle of the refrigerant circulating the refrigerator may be improved. Thereby, the power consumed by the refrigerator may also be reduced, and thus energy may be saved.

[0059] FIG. 3 is a view illustrating FIG. 2 in detail. Hereinafter, a description will be given with reference to FIG. 3.

[0060] The air blowing fan 50 may be fixed to the interior of the machine room 20 by a fan fixing bracket 22. The upper side of the fan fixing bracket 22 may be coupled and fixed to the upper outer side of the machine room 20, and the lower side of the fan fixing bracket 22 may be fixed to the defrost water tray 60.

[0061] That is, the space in the machine room 20 may be divided into left and right portions by the fan fixing bracket 22 and the air blowing fan 50.

[0062] The fan guide 52 may be formed in an annular shape as one whole component by being disposed at the upper and lower sides of the fan fixing bracket 22. That is, a hole allowing the air flow generated by the air blowing fan 50 to pass therethrough may be formed at the center of the fan guide 52.

[0063] The machine room 20 has a height only allowing the air blowing fan 50 and the condenser 40 to be installed therein and the defrost water tray 60 to be installed at the lower portion of the machine room 20. Increase in height of the machine room 20 may require reduction of the volume of the storage space in the refrigeration compartment or freezer compartment, resulting in lowered space utilization. Accordingly, the machine room 20 is structured such that the condenser 40, the defrost water tray 60 and the air blowing fan 50 are densely disposed. Accordingly, the air flow supplied by the air blowing fan may be greatly affected by the fan guide 52 and the guide part 70.

[0064] The condenser 40 may be provided with a refrigerant pipe 42 guiding the refrigerant discharged from the compressor 30 to the condenser 40.

[0065] The condenser 40 is installed at one side of the air blowing fan 50, and the rotating shaft 56 and the driving motor 54 transferring rotational force to the air blowing fan 50 are installed at the other side of the air blowing fan 50. When the air blowing fan 50 rotates in the machine room 20, air may move from the left side to the right side. Accordingly, the air flow generated by the air blowing fan 50 may also cool the compressor, which is not shown in FIG. 3.

[0066] The driving motor 54 is fixed to the interior of the machine room 20 by a motor fixing bracket 58. The motor fixing bracket 58 may support the lower portion of the driving motor 54.

[0067] FIG. 4 is a plan view of FIG. 3. Hereinafter, a description will be given with reference to FIG. 4.

[0068] When the defrost water tray 60 is viewed from the top, the driving motor 54 is positioned on the right and the rotating shaft 56 is positioned on the left. In addition, the air blowing fan 50 is installed on the rotating shaft 56, and the fan guide 52 is arranged.

[0069] The through surface 28 is positioned at one side of the fan guide 52, and the guide part 70 is arranged such that it overlaps a portion of the through surface 28.

[0070] The portion of the through surface 28 overlapping the guide part 70 is covered by the guide part 70, and the other portion of the through surface 28 that does not overlap the guide part 70 forms a path allowing air to pass therethrough.

[0071] The condenser 40 is arranged at one side of the through surface 28.

[0072] Depending upon the area of the portion of the through surface 28 covered by the guide part 70, the amount of the air flow directed to the condenser 40 and the defrost water tray 60 from the air blowing fan 50 may vary.

[0073] In this embodiment, the guide part 70 is provided. Accordingly, the air flow moving to the defrost water tray 60 to evaporate the defrost water is reduced, compared to the case in which the guide part 70 is not installed. On the other hand, the efficiency of cooling of the condenser 40 may be enhanced since a reduced amount of air is used to cool the condenser 40.

[0074] FIG. 5 is a conceptual view illustrating another embodiment of the present invention. Hereinafter, a description will be given with reference to FIG. 5.

[0075] Unlike the embodiment shown in FIG. 2, the embodiment illustrated in FIG. 5 has the guide part 70 disposed adjacent to the condenser 40 rather than to the air blowing fan 50.

[0076] In this embodiment, the guide part 70 may close a portion of the through surface 28, thereby preventing the air flow generated by the air blowing fan 50 from being guided to the defrost water tray 60.

[0077] FIG. 6 is a conceptual view illustrating a variation of the embodiment of FIG. 5. Hereinafter, a description will be given with reference to FIG. 6.

[0078] Unlike the embodiment shown in FIG. 5, in the

embodiment illustrated in FIG. 6, the guide part 70 is inclined downward as it extends away from the condenser 40.

[0079] Accordingly, by the guide part 70 arranged to overlap an area of the through surface 28, the flow of air supplied from the air blowing fan 50 to the defrost water tray 60 is adjusted. In addition, by adjusting the angle at which the guide part 70 is arranged to face the air blowing fan 50, the flow rate of the air moving from the air blowing fan 50 is controlled.

[0080] FIG. 7 is a conceptual view illustrating another embodiment of the present invention. Hereinafter, a description will be given with reference to FIG. 7.

[0081] In the embodiment illustrated in FIG. 7, the guide part 70 is disposed to be spaced a predetermined distance from the air blowing fan 50 and from the condenser 40.

[0082] In this embodiment, the guide part 70 covers a portion of the through surface 28 in an overlapping manner as in the previous embodiments.

[0083] FIG. 8 is a graph depicting the effects of the present invention. Hereinafter, a description will be given with reference to FIG. 8.

[0084] FIG. 8 shows a change rate of power consumption of the refrigerator (indicated by a dotted line) according to an area ratio between the guide part 70 and the through surface 28 and a change rate of the evaporated amount of defrost water in the defrost water tray 60 (indicated by a solid line). An area ratio can be calculated based on an area of the guide part 70 projected onto the through surface 28 as in the plan view of FIG. 4.

[0085] Reference values for the change rate of power consumption and the change rate of the evaporated amount are calculated assuming that the area ratio of the guide part 70 to the through surface 28 is 0, i.e., assuming that the guide part 70 is not provided.

[0086] On the horizontal axis of the graph in FIG. 8, 0% represents complete exposure of the through surface 28 due to absence of the guide part 70, and 100% represents full overlapping of the guide part 70 and the through surface 28, which prevent the air flow generated by the air blowing fan 50 from moving through the through surface 28.

[0087] The change rate of power consumption changes slowly, compared to the change rate of the evaporated amount. Accordingly, values obtained by multiplying the change rate of power consumption by 10 are shown in the graph. That is, the change rate of power consumption is adjusted to change in the range between 0.6% and -1.2% rather than in the range between 6.0% and -12.0% on the vertical axis.

[0088] It can be seen from FIG. 8 that the power consumption increases when the guide part 70 is arranged such that the area ratio of the guide part 70 to the through surface 28 is equal to or less than 58%. When the area ratio is about 45%, the power consumption increases to a maximum value of about 0.6%. That is, when the guide part 70 covers a small area of the through surface 28, the guide part 70 only increases resistance against the air flow generated by the air blowing fan 50. Accordingly, refrigeration cycle efficiency may be reduced.

[0089] On the other hand, when the area ratio is equal to or greater than 58%, the change rate of power consumption decreases to a negative value, and thus power consumption decreases. That is, the efficiency of cooling of the condenser 40 is improved, and accordingly the efficiency of refrigeration cycle is improved, and power consumption decreases.

[0090] When the area ratio is about 64%, the rate of change in the values of the change rate of power consumption decreases. However, since the change rate of power consumption has a large value even when the area ratio has a value around 65%, it is possible to limit the area ratio to a value equal to or greater than 64% in consideration of the energy efficiency.

[0091] When the change rate of power consumption reaches about 74%, change in the change rate decreases greatly. That is, when the area ratio increases to a value equal to or greater than 58%, power consumption reduces. While the change rate of power consumption is equal to or less than 74%, the rate of decrease in power consumption is large. When the change rate of power consumption becomes equal to or greater than 74%, the rate of decrease in power consumption decreases, and thus the effect of decrease in power consumption is lowered.

[0092] Meanwhile, the change rate of the evaporated amount is about -11% even when the guide part 70 completely covers the through surface 28, i.e., when the area ratio is 100%. That is, the defrost water in the defrost water tray 60 is evaporated not only by the air flow generated by the air blowing fan 50, but also through natural evaporation. Accordingly, even when the air from the air blowing fan 50 does not reach the defrost water, evaporation of the defrost water may occur.

[0093] However, in the case that a large amount of defrost water is suddenly supplied to the defrost water tray 60 with the area ratio reaching 100%, defrost water may flow over the defrost water tray 60 may flow. Accordingly, the change rate of the evaporated amount of the defrost water is preferably limited to within -10% such that defrost water accommodated in the defrost water tray 60 does not overflow.

[0094] That is, in this embodiment, within the range of change rate of the evaporated amount that does not cause short circuit due to the defrost water overflowing the defrost water tray 60, the air flow supplied by the air blowing fan 50 is used to cool the condenser rather than to evaporate the defrost water. Accordingly, cooling efficiency of the condenser may be improved, but the efficiency of evaporation of the defrost water may be lowered.

[0095] However, even when the efficiency of evaporation of the defrost water is lowered, there is no risk of causing short circuit due the defrost water overflowing the defrost water tray 60 since the defrost water can nat-

urally evaporate, and the defrost water tray 60 can contain the defrost water in a certain space thereof defrost water.

[0096] That is, in this embodiment, the air flow supplied by the air blowing fan 50 that is conventionally used may be more efficiently distributed. Thereby, a proper effect of evaporation of the defrost water may be achieved, while the refrigeration cycle efficiency is improved.

[0097] In other words, by efficiently distributing a limited resource, the power consumed by the refrigerator may be reduced, while problems caused due to defrost water may be prevented.

[0098] As is apparent from the above description, the present invention has effects as follows.

[0099] A machine room of a machine room according to one embodiment of the present invention may improve the cooling efficiency of a condenser by allowing a larger amount of air to be supplied to the condenser for an air blowing fan generating the same flow rate. Accordingly, heat exchange with the condenser may be facilitated and thus the temperature of the refrigerant passing through the condenser may be lowered. As a result, refrigeration cycle efficiency may be improved.

[0100] In addition, the defrost water accommodated in a defrost water tray may be evaporated using the air blowing fan. Therefore, the defrost water accommodated in the defrost water may be prevented from overflowing.

Claims

1. A machine room (20) of a refrigerator comprising:

a defrost water tray (60) to collect defrost water;
a condenser (40) installed at an upper side of the defrost water tray (60);
an air blowing fan (50) installed at one side of the condenser (40) to generate air flow; and
a guide part (70) to guide air supplied from the air blowing fan (50),
wherein the air blowing fan (50) is disposed at an upper side of the defrost water tray (60), and the guide part (70) is disposed between the condenser (40) and the air blowing fan (50) to prevent a portion of the air flow supplied by the air blowing fan (50) from moving to the defrost water tray (60).

2. The machine room according to claim 1, wherein the guide part (70) is configured to guide the air flow generated by the air blowing fan (50) such that a larger portion of the air flow is supplied to the condenser (40) than to the defrost water tray (60).

3. The machine room according to claim 1 or 2, wherein a through surface (28) having a path guiding air to the defrost water tray (60) is arranged between the condenser (40) and the air blowing fan (50),
wherein the guide part (70) closes a portion of the through surface (28).

4. The machine room according to claim 3, wherein the guide part (70) is configured to obstruct the air supplied by the air blowing fan (50) from passing through the through surface (28).

5. The machine room according to claim 3 or 4, wherein the guide part (70) is formed such that a ratio of an area of the guide part (70) to an area of the through surface (28) is between 58% and 100%.

6. The machine room of a refrigerator according to claim 5, wherein the guide part (70) is formed such that the ratio of the area of the guide part (70) to the area of the through surface (28) is between 58% and 74%.

7. The machine room of a refrigerator according to claim 5, wherein the guide part (70) is formed such that the ratio of the area of the guide part (40) to the area of the through surface (28) is between 64% and 74%.

8. The machine room of a refrigerator according to claim 5, wherein the guide part (70) is formed such that the ratio of the area of the guide part (70) to the area of the through surface (28) is 64%.

9. The machine room of a refrigerator according to any one of the preceding claims, wherein the guide part (70) is arranged adjacent to the air blowing fan (50).

10. The machine room of a refrigerator according to any one of claims 1 to 9, wherein the guide part (70) is arranged adjacent to the condenser (40).

11. The machine room of a refrigerator according to claim 10, wherein the guide part (70) is inclined downward while extending away from the condenser (40).

12. The machine room of a refrigerator according to any one of claims 1 to 9, wherein the guide part (70) is disposed spaced a predetermined distance from each of the air blowing fan (50) and the condenser (40).

13. The machine room of a refrigerator according to any one of the preceding claims, wherein a fan guide (52) is arranged on an outer circumferential surface of the air blowing fan (50),
wherein the fan guide (52) is configured to guide the air flow generated by the air blowing fan (50) in a direction of a rotating shaft of the air blowing fan (50).

14. The machine room of a refrigerator according to

claim 13, wherein the rotating shaft of the air blowing fan (50) is parallel with a ground surface and is directed toward the condenser (40).

15. The machine room of a refrigerator according to any one of the preceding claims, wherein a compressor (30) to compress a refrigerant is arranged at one side of the condenser (40),
wherein the compressor (30) is cooled by the air flow supplied from the air blowing fan (50).

FIG. 1

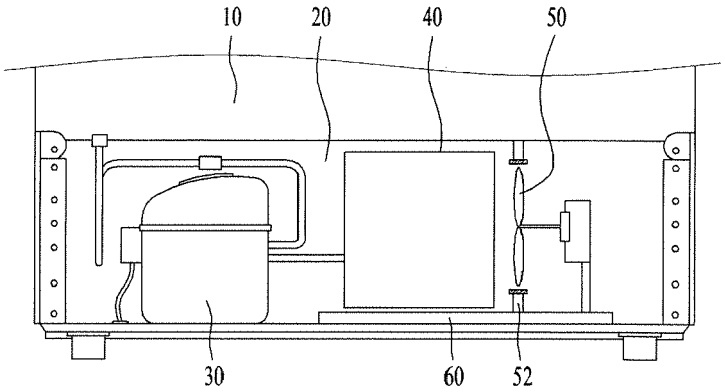


FIG. 2

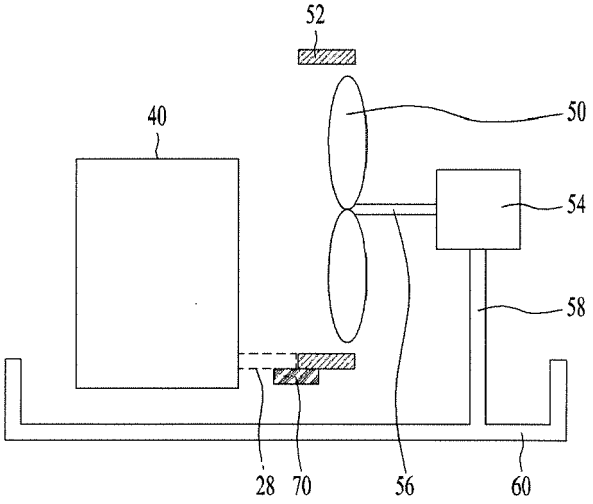


FIG. 3

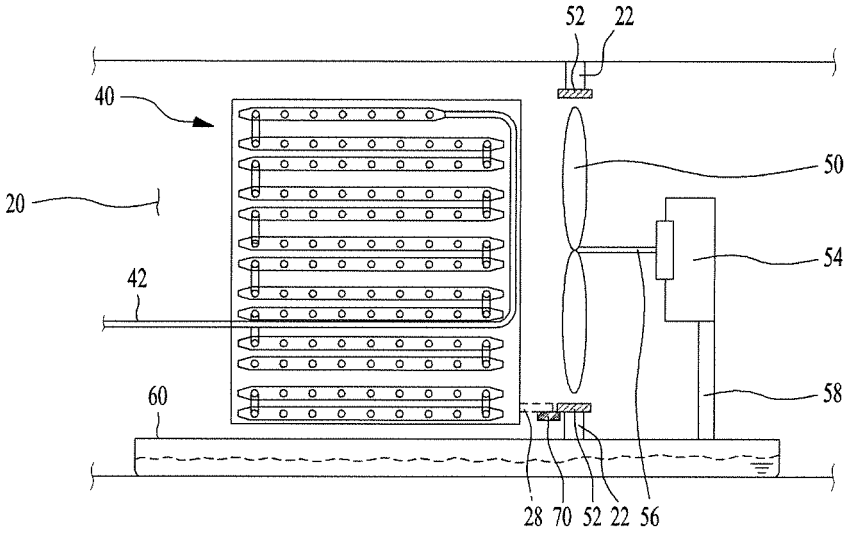


FIG. 4

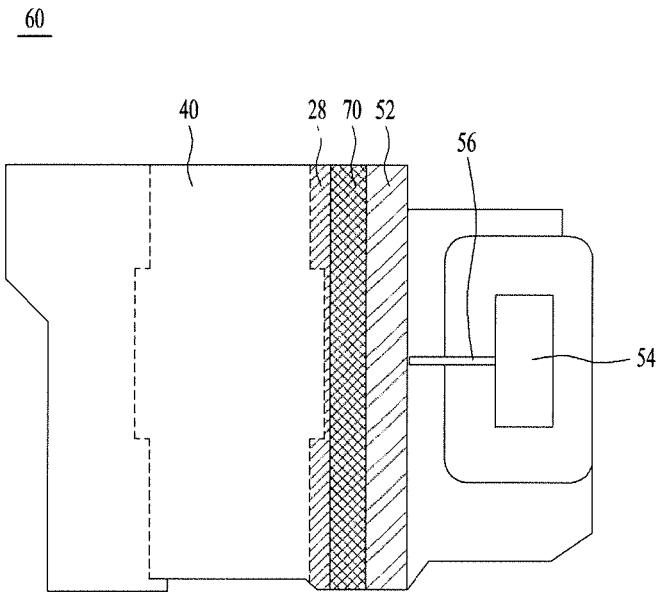


FIG. 5

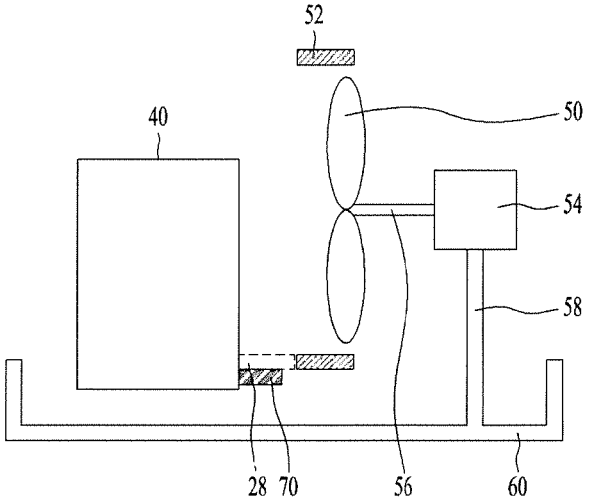


FIG. 6

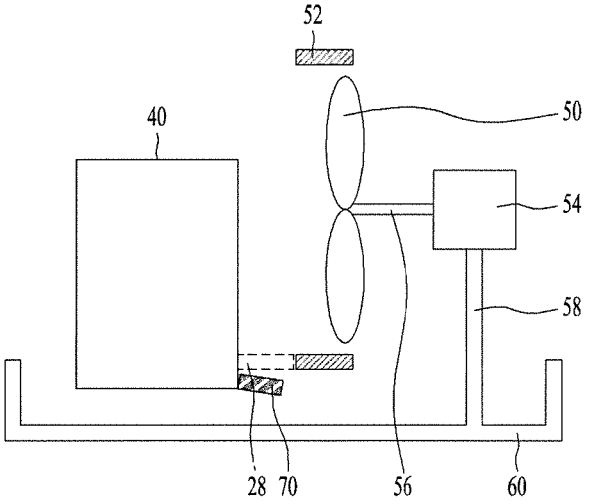


FIG. 7

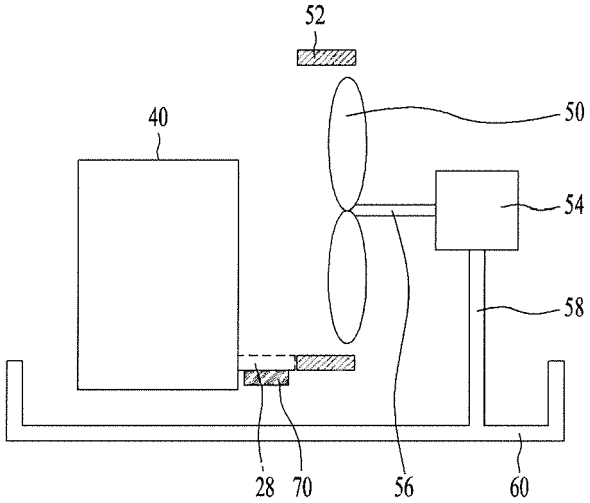
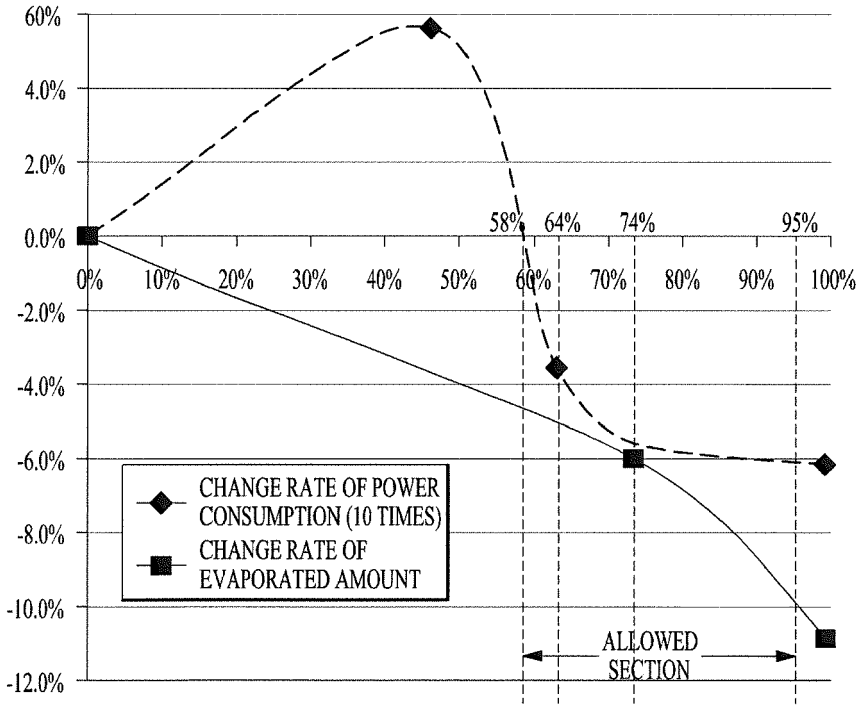

52
40
50
54
58
28
70
56
60

FIG. 8


60%
4.0%
2.0%
0.0%
-2.0%
-4.0%
-6.0%
-8.0%
-10.0%
-12.0%
0%
10%
20%
30%
40%
50%
58%
64%
70%
74%
80%
90%
95%
100%
CHANGE RATE OF POWER CONSUMPTION (10 TIMES)
CHANGE RATE OF EVAPORATED AMOUNT
ALLOWED SECTION