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(71) Applicant: **SAMSUNG ELECTRONICS CO., LTD.**
Suwon-si,
Gyeonggi-do (KR)

(72) Inventors:
- **Yu, Lei**
  Shinnamushil Apt. 517-402
  Suwon-si, Gyeonggi-do (KR)
- **Ahn, Ji-hun**
  Gyeonggi-do (KR)

(74) Representative: **Grey, Ian Michael et al**
Venner Shipley LLP
20 Little Britain
London EC1A 7DH (GB)

(54) Refrigerator

(57) A refrigerator including a condenser (32). The condenser comprises a plurality of condensing elements (32a, 32b) disposed separately from each other.

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Description

[0001] The present invention relates to a refrigerator including a condenser.

[0002] A refrigerator conventionally comprises a refrigerator body with a cooling compartment and a freezing compartment. Doors are mounted to the front of the refrigerator body to separately open and close the compartments and a component chamber is provided in a lower space of the refrigerating body wherein a compressor to compress a refrigerant and a condenser to condense the refrigerant supplied from the compressor are installed.

[0003] Additionally, a cooling means to cool hot air generated in the compressor and the condenser is mounted in the component chamber. The cooling means include an inlet and an outlet located on a rear cover and positioned adjacent to the condenser and compressor respectively. A fan is disposed in the compartment chamber such that an airflow is generated therethrough.

[0004] However, the fan and condenser are generally arranged relative to each other such that a fan 102 is disposed to blow air towards a condenser 103 located in a cooling chamber 110, as illustrated in Figure 5A, or otherwise, such that a fan 112 is disposed to draw air from a condenser 113 located in a cooling chamber 110 as illustrated in Figure 5B.

[0005] A problem with the arrangement illustrated in Figure 5A wherein the fan 102 blows air towards the condenser is that direct movement of the air is distorted in front of the condenser 103 because of the resistance generated by a tube and fins of the condenser 103. Similarly, a problem with the arrangement illustrated in Figure 5B wherein the fan 112 draws air from the condenser 113 is that direct movement of the air is distorted because of the resistance generated by the rear of the condenser 113.

[0006] The present invention seeks to provide a refrigerator which overcomes or substantially alleviates the problems discussed above and in which the heat radiating efficiency is improved.

[0007] A refrigerator according to the present invention is characterised in that the condenser comprises a plurality of condensing elements disposed separately from each other.

[0008] The refrigerator may further comprise at least one fan wherein the fan is disposed between the plurality of condensing elements.

[0009] Preferably, the condenser comprises a first and a second condensing element and a fan is disposed between the first and second condensing elements such that air is drawn through the first condensing element and is subsequently blown through the second condensing element.

[0010] In a preferred embodiment, the plurality of condensing elements are integrally connected.

[0011] Advantageously, the refrigerator further comprises a compressor wherein air drawn through the plurality of condensing elements is supplied to the compressor.

[0012] Embodiments of the invention will now be described, by way of example only, with reference to Figures 1 to 4 of the accompanying drawings, in which:

Figure 1 is a perspective view of a refrigerator in accordance with the present invention;
Figure 2 is a schematic diagram illustrating a component chamber of the refrigerator;
Figure 3 is a diagram illustrating the airflow in the compartment chamber shown in Figure 2 when a fan located therein is operated;
Figure 4 is a graph showing the heat radiating efficiency of a conventional refrigerator compared to a refrigerator according to the present invention; and
Figures 5A and 5B illustrate the airflow in the component chamber of a conventional refrigerator when a fan located therein is operated.

[0013] Referring to the drawings, there is shown in Figure 1 a refrigerator comprising a refrigerator body 1 with a cooling compartment 10 and a freezing compartment 20 located internally therein on the right and left sides respectively. The refrigerator body 1 also includes a cooling compartment door 11 and a freezing compartment door 21 to open and close their respective front openings. Door guides 12 and 22 are disposed inside each of the cooling and freezing compartment doors 11,21 to receive bottles and the like therein.

[0014] A plurality of racks 13,23 and a plurality of receiving boxes 14,24 are located in the cooling and freezing compartments 10,20.

[0015] Referring to Figure 2, a component chamber 30 is located in a rear lower space of the refrigerator body 1. Within the component chamber 30 are installed a number of components including a compressor 31 to compress a refrigerant, a condenser 32 to condense the refrigerant from the compressor 31, and a fan 33 provide an air flow across the condenser 32. The compressor 31 and the condenser 32 are separately installed at opposite sides of the component chamber 30.

[0016] The condenser 32 and the fan 33 are mounted to a supporting plate 34 which is installed in the component chamber 30. The condenser 32 comprises a first condensing element 32a and a second condensing element 32b to condense the refrigerant supplied from the compressor 31. The first and second condensing elements 32a,32b are displaced apart from each other but are integrally connected and fan 33 is disposed in the space therebetween.

[0017] The first condensing element 32a is located between the compressor 31 and the fan 33 and the fan 33 is located in a space between the first condensing element 32a and the second condensing element 32b.

[0018] The flow of air inside the component chamber 30 due to the fan 33 is shown in Figure 3. Air is drawn through the second condensing element 32b by the fan

33 and is subsequently blown through the first condensing element 32a by the fan wherein the air having passed through the first condensing element 32a is directed toward the compressor 31.

[0019] When a component installed in the component chamber 30, such as the compressor 31, is operated when the refrigerator starting operating, the air temperature inside the component chamber 30 is raised due to the heat generated as a result of operation of the component. The air inside the component chamber 30 is then circulated dependent on the operation of the fan 33.

[0020] According to the present invention, the fan 33 draws air through the second condensing element 32b and subsequently blows it through the first condensing element 32a. The condenser 32 includes the first and the second condensing parts 32a and 32b positioned separately from each other. The fan 33 is displaced between the first condensing part 32a and the second condensing part 32b. As a result, the refrigerator according to the present invention has an improved condensation efficiency compared with the conventional refrigerators as illustrated in Figures 5A or 5B.

[0021] The above-described features of the present invention may be more clearly ascertained by reference to a graph shown in Figure 4, which compares the condensing efficiency of the conventional art and that of the present invention.

[0022] According to the graph shown in Figure 4, a bar elevated higher toward a vertical axis indicates a higher heat radiation efficiency. Referring to the graph, the condensation efficiency of the refrigerator according to the present invention, is remarkably higher than the conventional refrigerator as illustrated in Figures 5A and 5B.

[0023] In the exemplary embodiment described above, a pair of condensing parts are provided. However, the number of condensing parts is not limited but may be increased as necessary. Likewise, a fan is interposed between the pair of condensing parts in the above-described embodiment, but the number of fans may be increased according to the number of condensers.

[0024] Also in the above-described embodiment, a plurality of condensing parts are integrally connected. However, the plurality of condensing parts are manufactured independently and are then connected by a coupler.

[0025] Although an embodiment of the invention has been shown and described, it will be appreciated by those skilled in the art that changes may be made in this embodiment without departing from the principles of the invention, the scope of which is defined in the claims and their equivalents and the foregoing description should be regarded as a description of a preferred embodiment only.

Claims

1. A refrigerator including a condenser **characterised in that** the condenser comprises a plurality of condensing elements disposed separately from each other.

2. A refrigerator according to claim 1 further comprising at least one fan wherein the fan is disposed between the plurality of condensing elements.

3. A refrigerator according to claim 2 wherein the condenser comprises a first and a second condensing element and the fan is disposed between the first and second condensing elements such that air is drawn through the first condensing element and is subsequently blown through the second condensing element.

4. A refrigerator according to any preceding claim wherein the plurality of condensing elements are integrally connected.

5. A refrigerator according to any preceding claim wherein the refrigerator further comprises a compressor wherein air drawn through the plurality of condensing elements is supplied to the compressor.

6. A refrigerator having a refrigerator body and a component chamber provided in the refrigerator body to accommodate components, comprising a condenser provided in the component chamber, and having a plurality of condensing parts positioned separately from each other and at least one fan provided in the component chamber, to cool the condenser.

7. The refrigerator according to claim 6 wherein the fan is provided between the plurality of condensing parts.

8. The refrigerator according to claim 7 wherein the plurality of condensing parts are provided in pair.

9. The refrigerator according to claim 8 wherein the fan is interposed between the pair of condensing parts, to inhale air from any one of the pair of condensing parts and to send the air to the other of the pair of condensing parts.

10. The refrigerator according to any preceding claim wherein the pair of condensing parts are integrally connected.

11. The refrigerator according to claim 7 further comprises a compressor to compress a refrigerant and the condenser to condense the refrigerant from the compressor wherein the compressor and the condenser are separately installed at opposite sides of the component chamber.

12. The refrigerator according to claim 11 wherein one of the plurality of condensing parts is displaced be-

tween the compressor and the fan, and the fan is displaced in a space between the one of the plurality of condensing parts and another one of the plurality of condensing parts.

13. A refrigerator having a refrigerator body and a component chamber provided in the refrigerator body to accommodate components, comprising a plurality of condensers provided in the component chamber, each having a plurality of condensing parts positioned separately from each other and at least one fan provided in the component chamber and between each of the plurality of condensing parts to cool the condensers.

14. A refrigerator having a refrigerator body and a component chamber provided in the refrigerator body to accommodate components, comprising a compressor provided in the component chamber to compress a refrigerant a condenser provided in the component chamber to condense the refrigerant from the compressor and

at least one fan provided in the component chamber to cool the condenser, wherein the condenser includes a first condensing part and a second condensing part positioned separately from each other, and the fan is provided between the first condensing part and the second condensing part.

FIG. 1

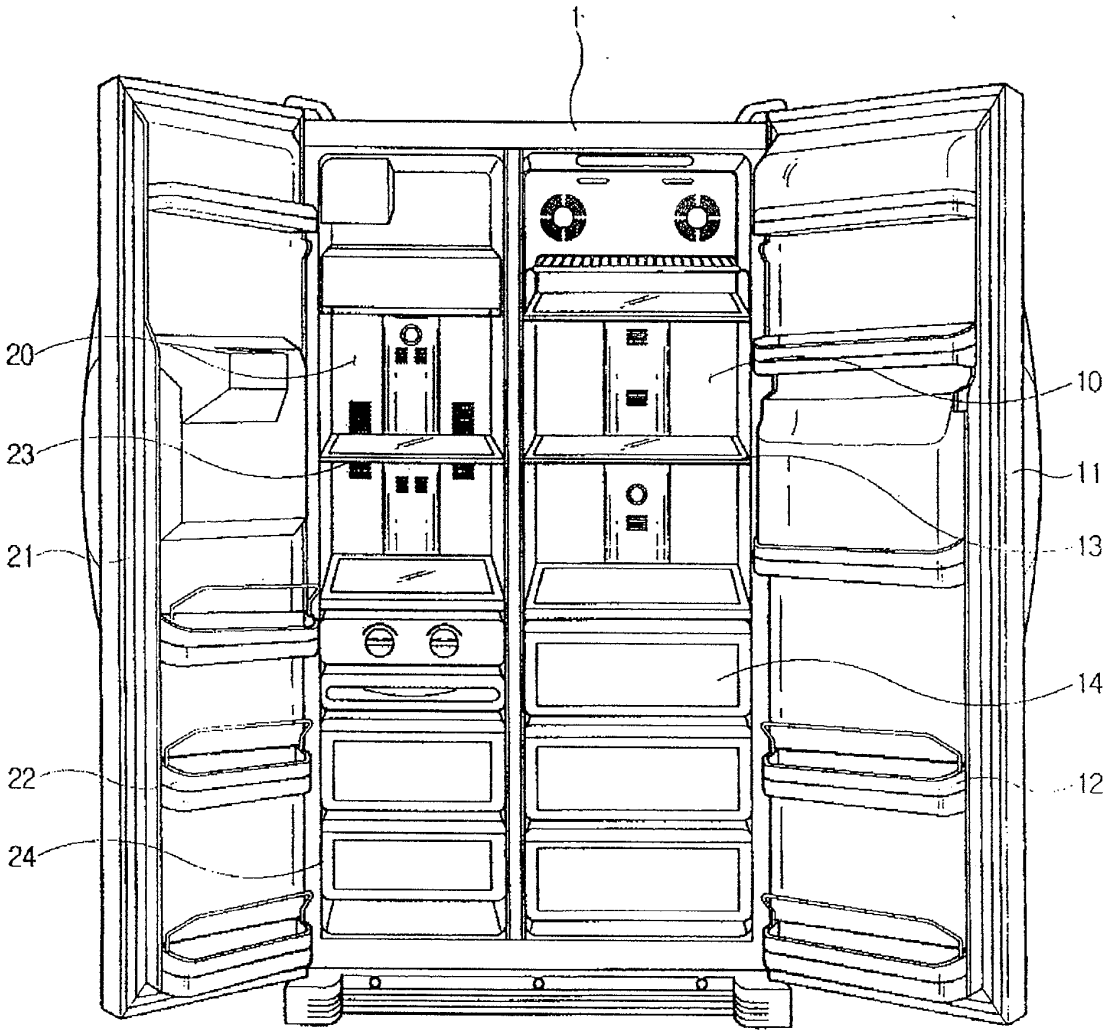


FIG. 2

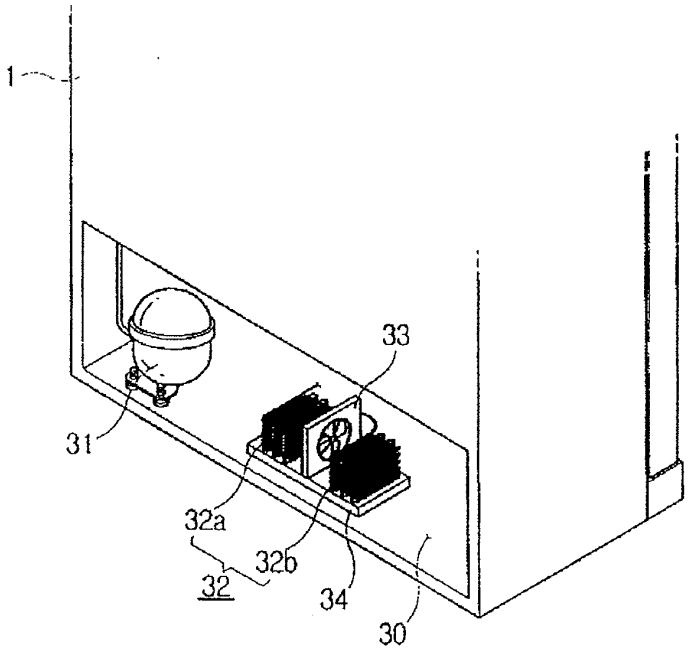


FIG. 3

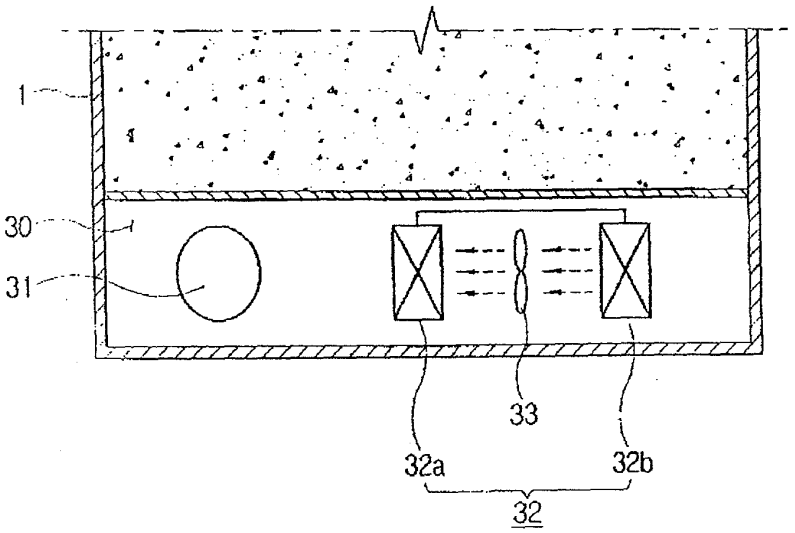
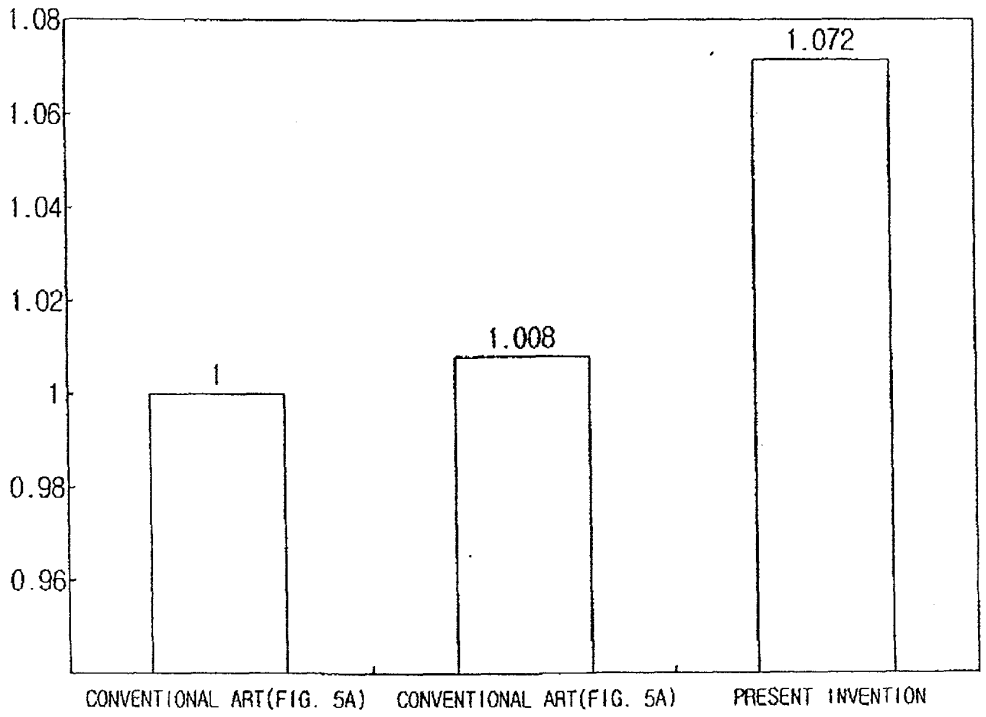


FIG. 4


1.08
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1.04
1.02
1
0.98
0.96
1
1.008
1.072
CONVENTIONAL ART(FIG. 5A)
CONVENTIONAL ART(FIG. 5A)
PRESENT INVENTION

FIG. 5A
(PRIOR ART)

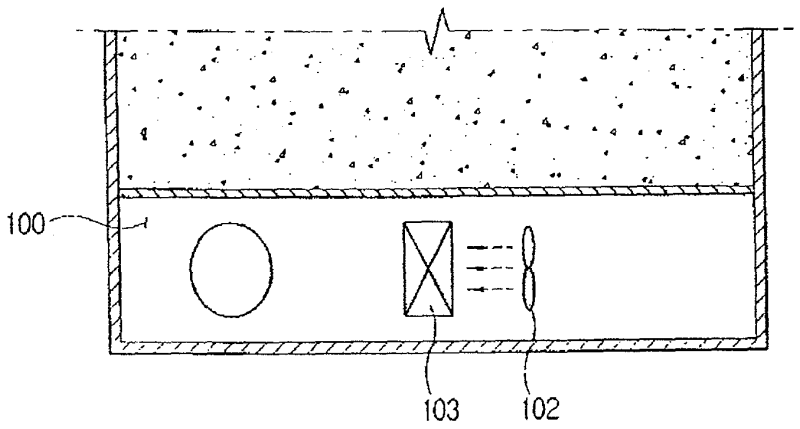

FIG. 5B
(PRIOR ART)