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(54) **REFRIGERATOR AND MANUFACTURING METHOD OF THE SAME**

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(57) **ABSTRACT**

A refrigerator includes a main body cabinet having a first storage room and a second storage room to be divided with the first storage room and respectively cooled, an evaporator having a first evaporating part disposed at the main body cabinet and cooling the first storage room, a second evaporating part disposed at the main body cabinet to be apart from the first evaporating part and cooling the second storage room, and a refrigerant moving pipe connecting the first and second evaporating parts, and a duct guiding cooling air generated by the first and second evaporating parts to the first and second storage rooms to respectively cool the first and second storage rooms, the first and second evaporating parts and the refrigerant moving pipe are formed with one evaporating pipe. The refrigerator forms integrally an evaporator for cooling a first storage room and a second storage room respectively.

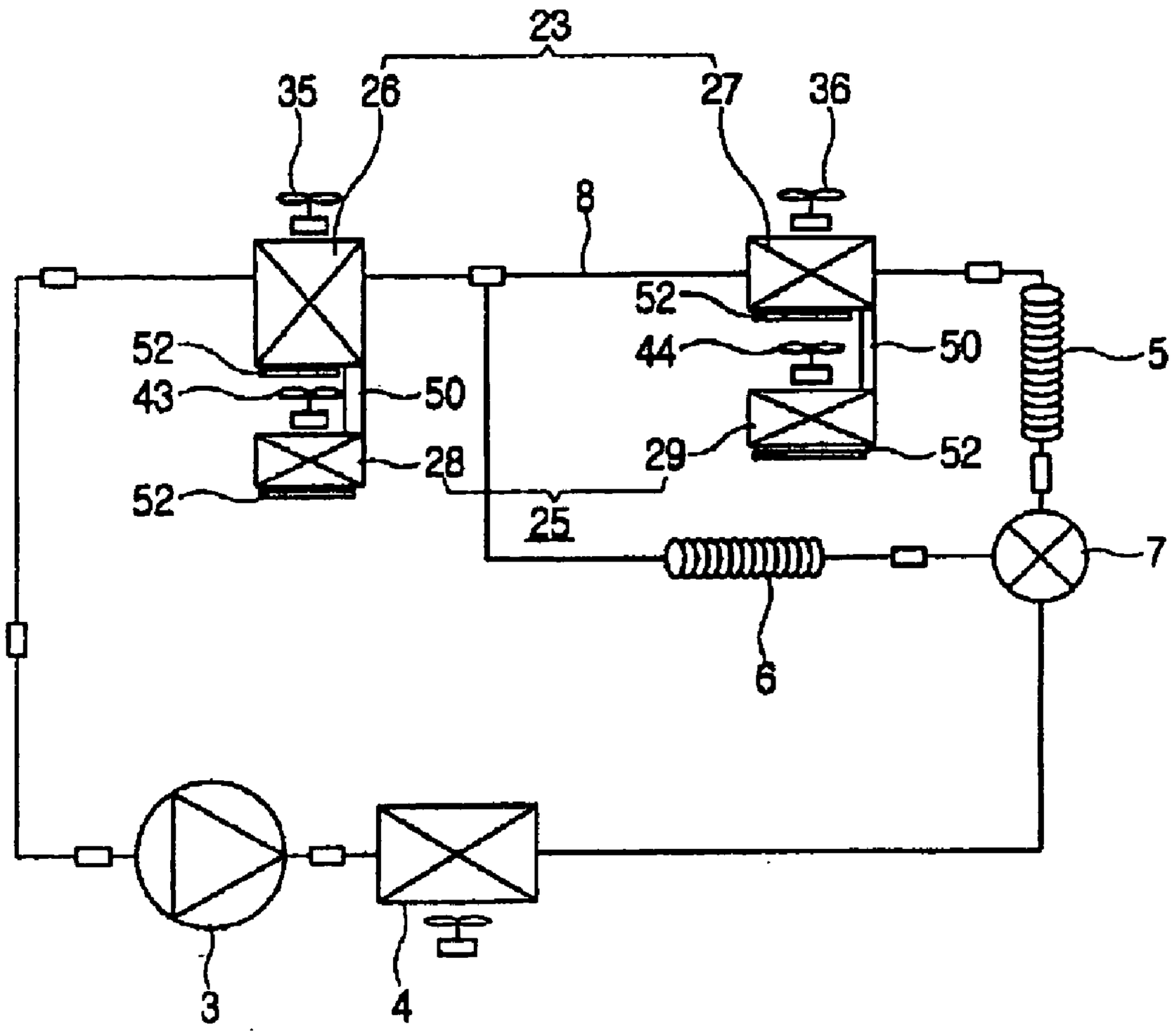

FIG. 1

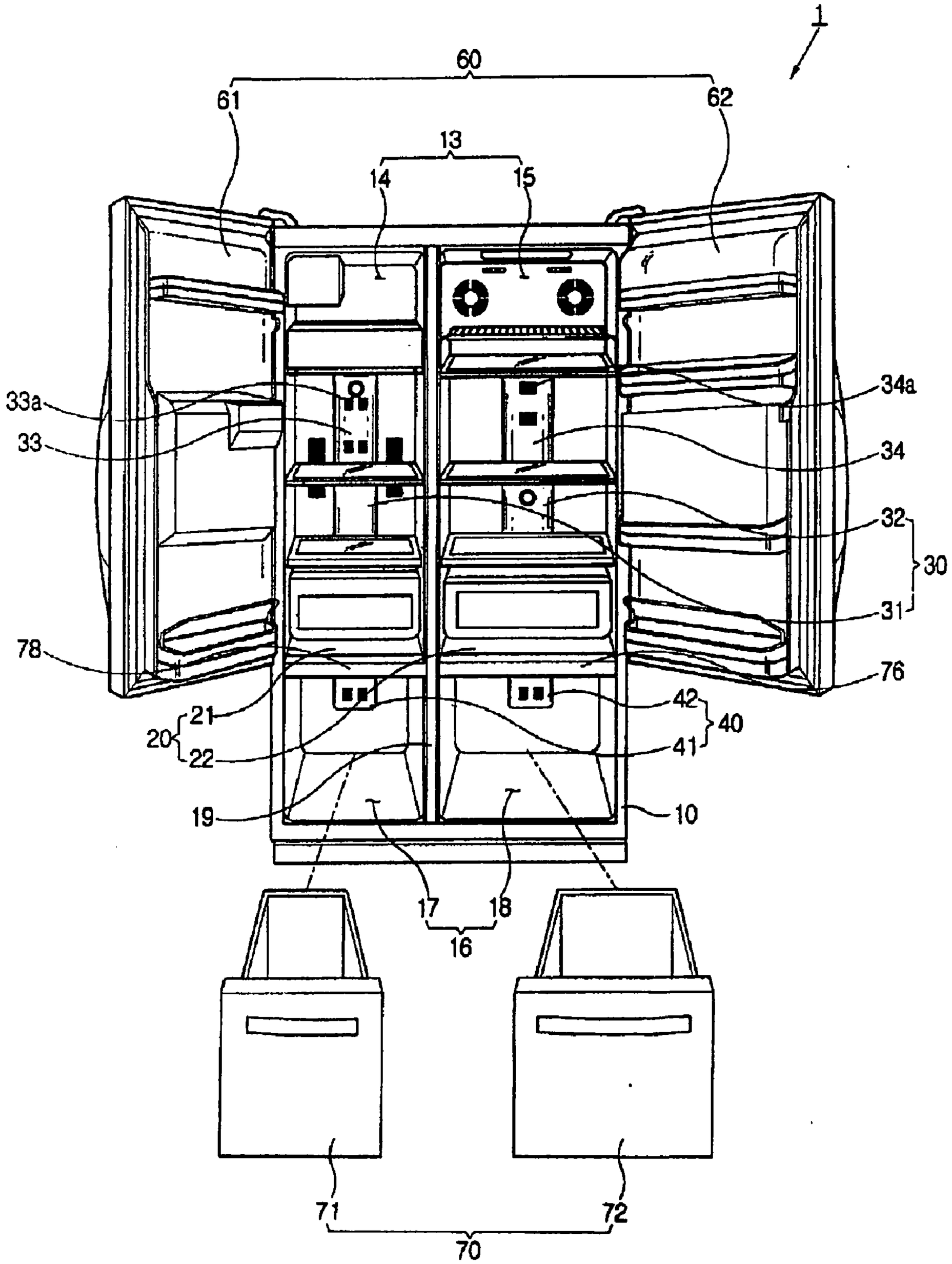
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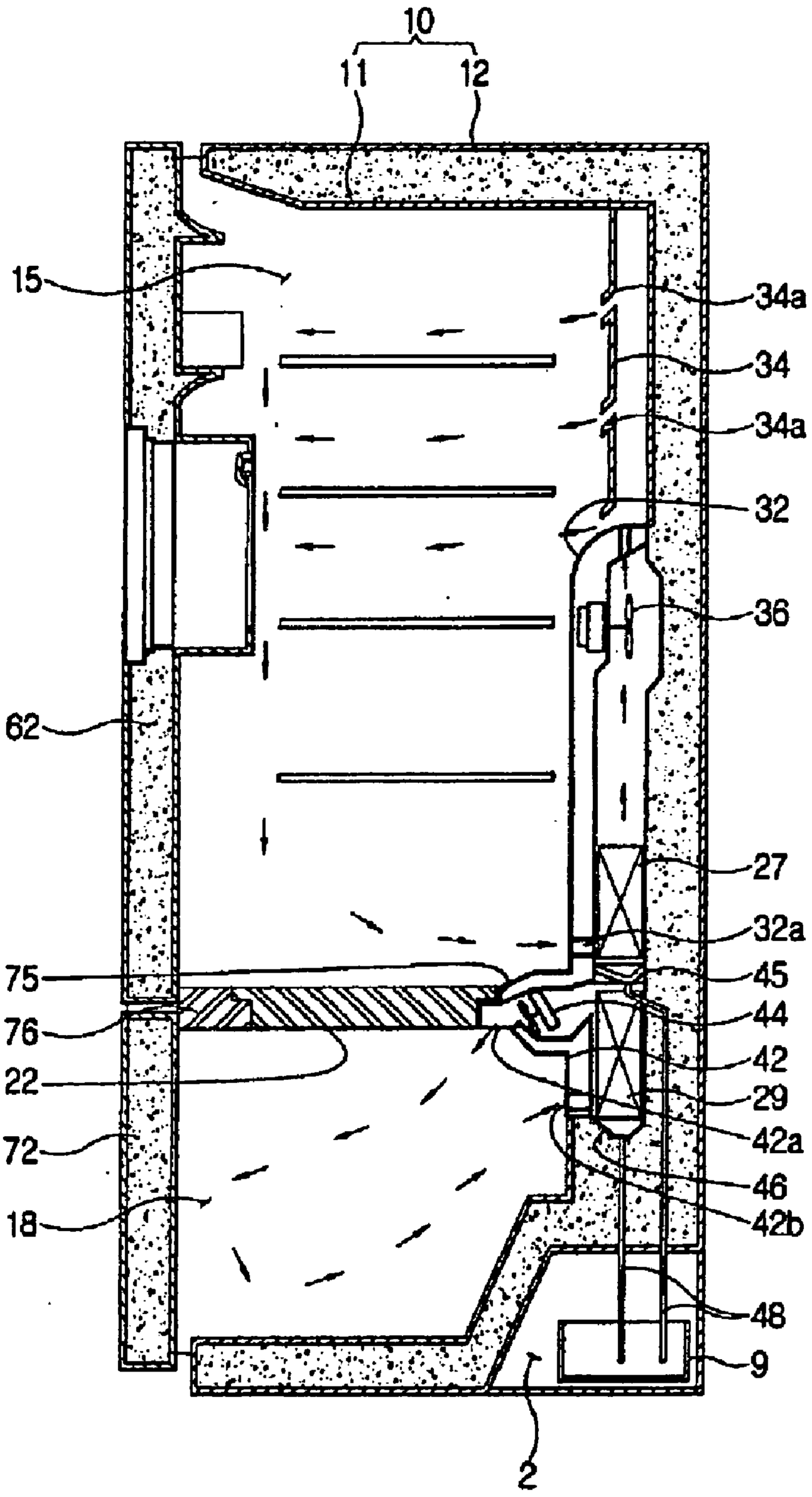
FIG. 2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42a
46
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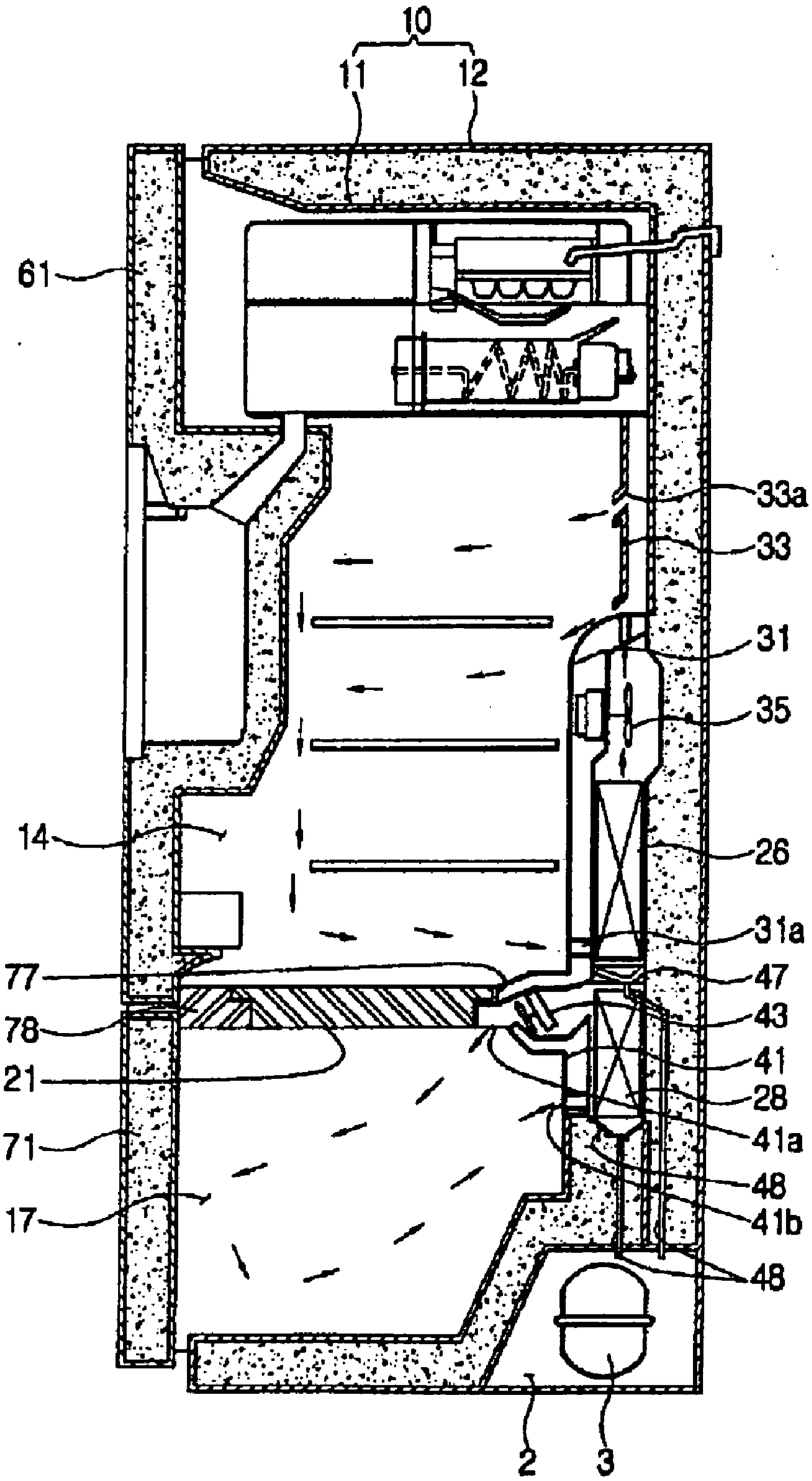
42b
48
9
2

FIG. 3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17
41b
48
2
3

FIG. 4

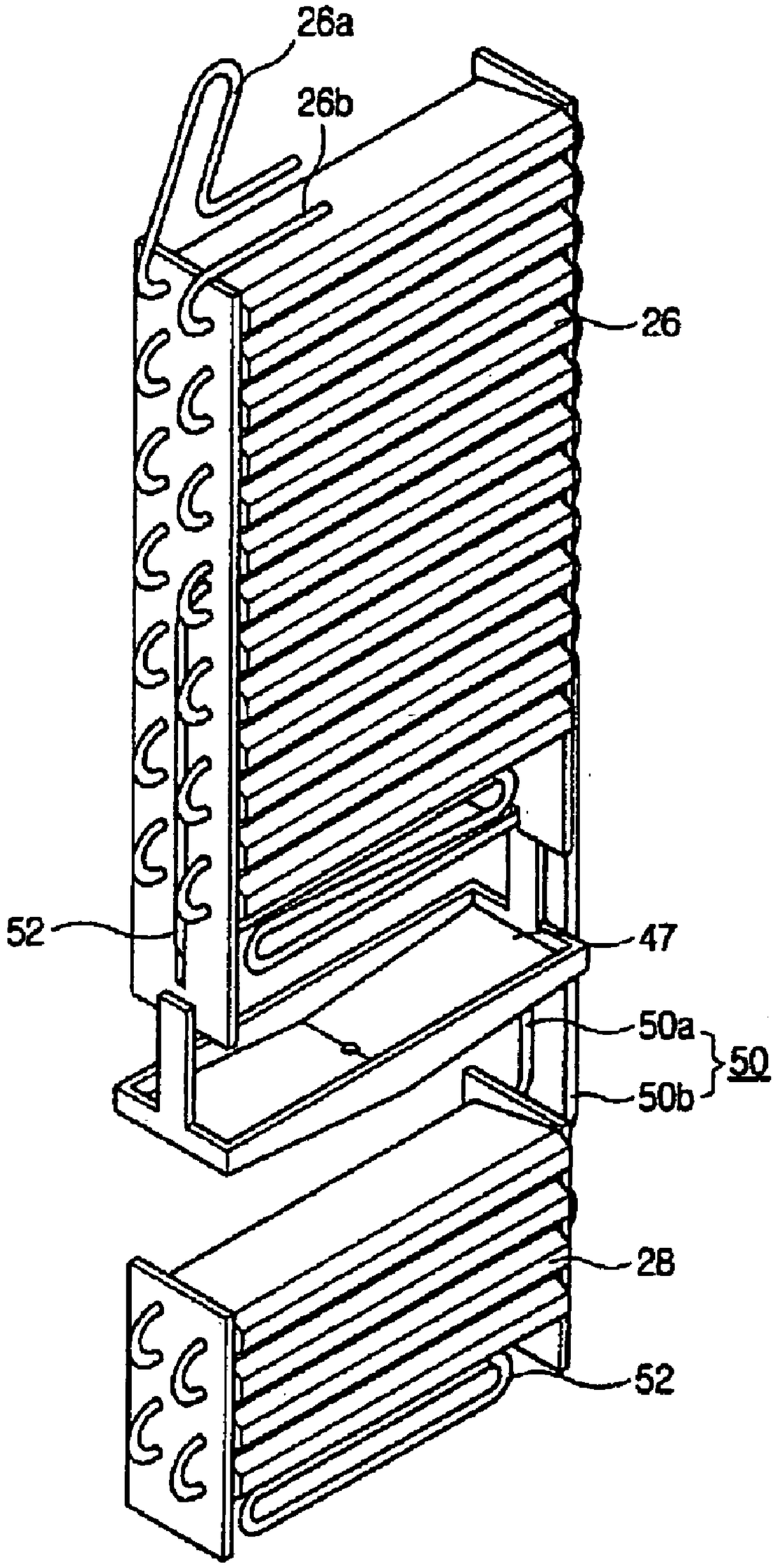


FIG. 5

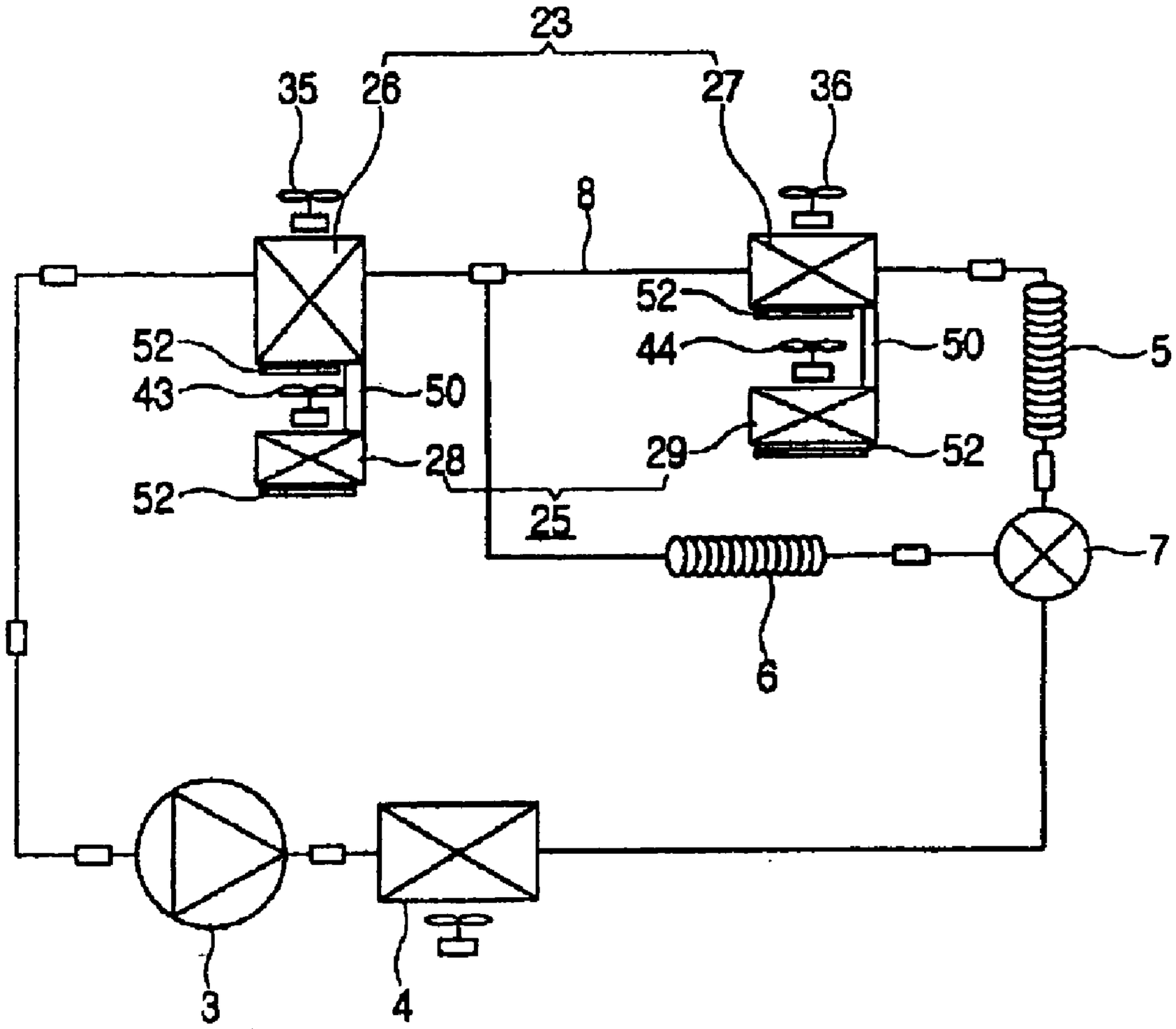
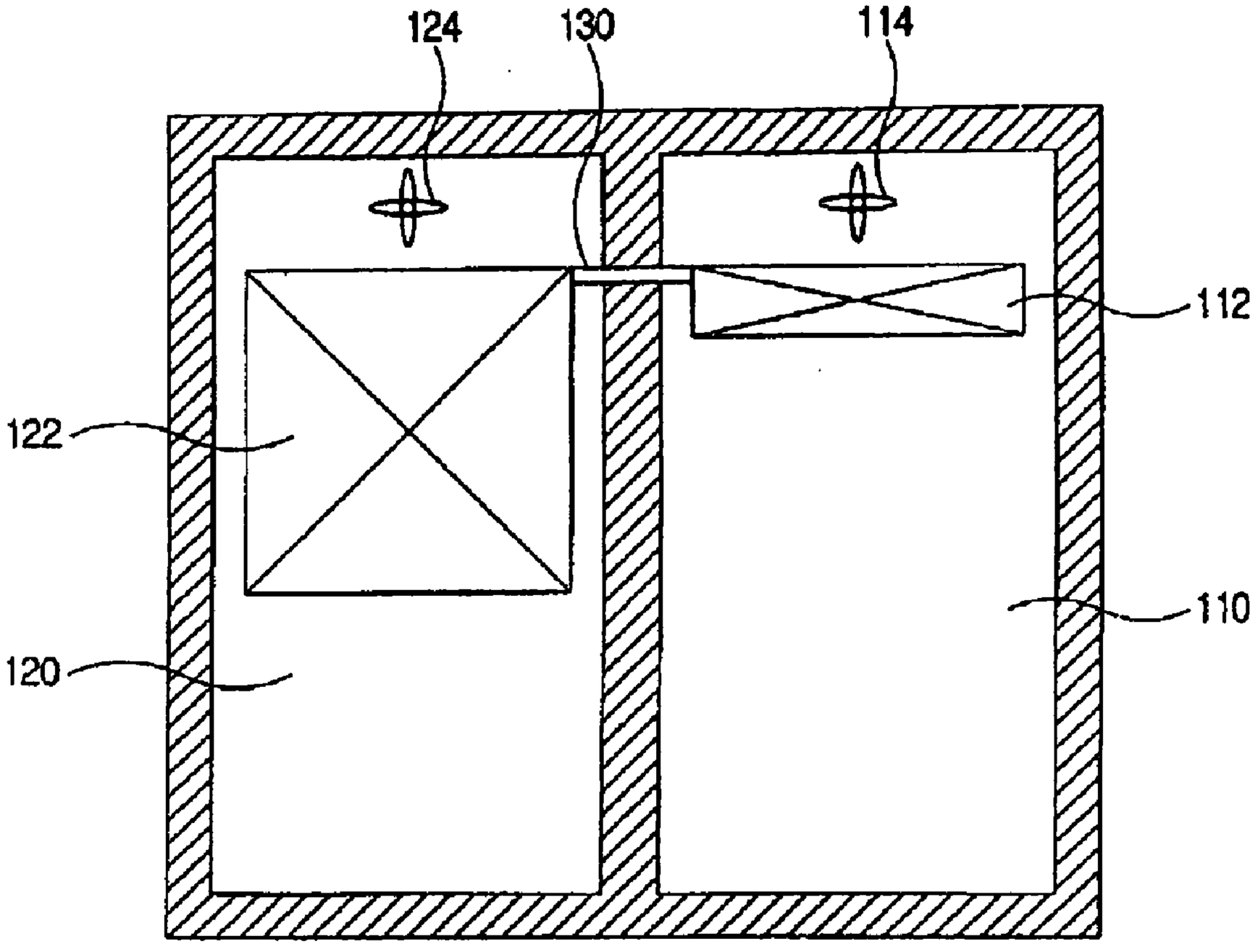


FIG. 6



REFRIGERATOR AND MANUFACTURING METHOD OF THE SAME

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of Korean Patent Application No. 10-2004-0110332, filed on Dec. 22, 2004, and Korean Patent Application No. 10-2005-0078963, filed on Aug. 26, 2005, in the Korean Intellectual Property Office, the disclosures of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a refrigerator. More particularly, to a refrigerator in which a separation partition dividing between a first storage room and a second storage room can be separated.

[0004] 2. Description of the Related Art

[0005] A conventional refrigerator disclosed in Korean Utility Model Application No. 1996-0034205 includes a plurality of evaporators to enhance efficiency of cooling. That is, an evaporator is respectively disposed in a cooler and a freezer of the refrigerator, thereby cooling an inside of the refrigerator. In **FIG. 6**, a conventional refrigerator having a freezer and a cooler includes a cooler evaporating part **112** and a fan motor **114** disposed at the cooler **110**, and a freezer evaporating part **122** and a fan motor **124** disposed at the freezer **120**. A connecting refrigerant pipe **130** is provided between the cooler **110** and the freezer **120** for connecting the cooler evaporating part **112** and the freezer evaporating part **122**.

[0006] In the conventional refrigerator refrigerant passes through a compressor (not shown) and a condenser (not shown) and flows into the cooler evaporating part and the freezer evaporating part. The refrigerant is then evaporated to cool the cooler and freezer, and again flows into the compressor.

[0007] Meanwhile, recently, a refrigerator having an auxiliary storage room, which is separated from a main storage room such as a freezer and a cooler, for storing food has been developed. Generally, a storage volume of the auxiliary storage room is smaller than that of the freezer and the cooler.

[0008] However, the auxiliary storage room needs a respective evaporator which is separated from the freezer and the cooler so as to cool the auxiliary storage room, thereby making the structure more complicated. Further, an installation space for the evaporator for the auxiliary storage room is small, and therefore it is difficult to dispose the evaporator.

SUMMARY OF THE INVENTION

[0009] Accordingly, it is an aspect of the present invention to provide a refrigerator capable of forming integrally an evaporator for cooling a first storage room and a second storage room, respectively.

[0010] Further, it is an aspect of the present invention to provide a manufacturing method of a refrigerator capable of enhancing the efficiency of work to mount the evaporator for the second storage room without difficulty.

[0011] Additional aspects and/or advantages of the invention will be set forth in part in the description which follows and, in part, will be apparent from the description, or may be learned by practice of the invention.

[0012] The foregoing and/or other aspects of the present invention are achieved by providing a refrigerator including a main body cabinet having a first storage room and a second storage room to be divided from the first storage room and respectively cooled, an evaporator having a first evaporating part disposed at the main body cabinet and cooling the first storage room, a second evaporating part disposed at the main body cabinet to be apart from the first evaporating part and cooling the second storage room, and a refrigerant moving pipe connecting the first and second evaporating parts, and a duct to guide cooling air generated by the first and second evaporating parts to the first and second storage rooms to respectively cool the first and second storage rooms, wherein the first and second evaporating parts and the refrigerant moving pipe are formed with one evaporating pipe.

[0013] The refrigerant moving pipe includes a first refrigerant moving pipe provided between the first and second evaporating parts so that the refrigerant passing through one area of the first evaporating part is transferred to the second evaporating part, and a second refrigerant moving pipe provided between the first and second evaporating parts so that the refrigerant passing through the second evaporating part from the first refrigerant moving pipe is transferred to the other area of the first evaporating part.

[0014] The refrigerator further includes a separating partition detachably coupled with the main body cabinet to divide the first and second storage rooms.

[0015] The duct includes a first duct disposed at the main body cabinet and forming a cooling air pathway of the first evaporating part, and a second duct disposed at the main body cabinet and forming a cooling air pathway of the second evaporating part, and the separating partition is coupled with at least one of the first duct and the second duct.

[0016] The refrigerator further includes a coupling part supporting a rear end part of the separating partition on a central area of the first and second ducts, and wherein the first duct is integrally provided with second duct.

[0017] The refrigerator further includes a seating part provided in a front area of the main body cabinet and placed between the first and second storage rooms to support a front end part of the separating partition.

[0018] The refrigerator further includes a separating tray provided in a space between the first and second evaporating parts to prevent the cooling air generated from the first and second evaporating parts from being mixed each other.

[0019] The refrigerator further includes a defrost heater to defrost the first evaporating part, and wherein the separating partition receives defrost water defrosted by the defrost heater.

[0020] The first and second storage rooms are divided in the main body cabinet in a vertical direction by the separating partition.

[0021] A manufacturing method of a refrigerator having a first storage room and a second storage room to be divided with the first storage room and respectively cooled, the method includes providing an evaporator having a first evaporating part and a second evaporating part to be apart from each other to respectively cool the first and second storage rooms, and a refrigerant moving pipe connecting the first and second evaporating parts, providing a separating partition detachably coupled with the main body cabinet to divide between the first and second storage rooms, disposing the evaporator at the main body cabinet so that the first and second evaporating parts correspond to the first and second storage rooms in a state that the separating partition is separated from the main body cabinet, and disposing the separating partition at the main body cabinet to divide between the first and second storage rooms.

[0022] The first evaporating part and the second evaporating part, and the refrigerant moving pipe are formed with one evaporating pipe without joints.

[0023] The manufacturing method further includes disposing a separating tray at a space of the first and second evaporating parts to prevent cooling air generated from the first and second evaporating parts from being mixed each other.

[0024] The manufacturing method further includes providing a duct detachably coupled inside the first and the second storage rooms, and disposing the duct at the main body cabinet so that the duct is mounted to a front of the evaporator.

[0025] The manufacturing method further includes providing a coupling part supporting a rear end part of the separating partition on the duct.

[0026] The manufacturing method further includes providing a seating part in a front area of the main body cabinet placed between the first and second storage rooms to support the front end part of the separating partition.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] The above and/or other aspects and advantages of the present invention will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings of which:

[0028] **FIG. 1** is a front perspective view illustrating a refrigerator according to an embodiment of the present invention;

[0029] **FIG. 2** is a cross-sectional view illustrating a cooler of the refrigerator according to an embodiment of the present invention;

[0030] **FIG. 3** is a cross-sectional view illustrating a freezer of the refrigerator according to an embodiment of the present invention;

[0031] **FIG. 4** is a perspective view illustrating an evaporator of the refrigerator according to an embodiment of the present invention;

[0032] **FIG. 5** illustrates a cooling cycle of the refrigerator according to an embodiment of the present invention; and

[0033] **FIG. 6** is a cross-sectional view illustrating a conventional refrigerator.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0034] Reference will now be made in detail to the embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to like elements throughout. The embodiments are described below so as to explain the present invention by referring to the figures.

[0035] In **FIGS. 1-5**, a refrigerator **1** according to an embodiment of the present invention comprises a main body cabinet **10** having a first storage room **13** and a second storage room **16** divided with the first storage room **13** to be respectively cooled, evaporators **23**, **25** to supply cooling air to the first and second storage rooms **13**, **16**, and ducts **30**, **40** to guide the cooling air generated by the evaporators **23**, **25** to the first and second storage rooms **13**, **16** corresponded thereto so as to respectively cool the first and second storage rooms **13**, **16**.

[0036] The first storage room **13** may be used in a main storage room, and the second storage room **16** may be used in an auxiliary storage room, for example. Thus, in this embodiment of the present invention, the first storage room **13** is referred to as the main storage room **13**, and the second storage room **16** is referred to as the auxiliary storage room **16**.

[0037] The refrigerator **1** comprises a main door **60** and an auxiliary door **70** provided in the main body cabinet **10** and to open/close the main storage room **13** and the auxiliary storage room **16**.

[0038] The main body cabinet **10** comprises an inner casing **11** formed with the main storage room **13** and the auxiliary storage room **16**, and an outer casing **12** to be apart from the inner casing **11** with a foaming material, thereby forming an external appearance. In a rear lower side of the main body cabinet **10** is provided a machine room **2** installed with a compressor **3** to compress refrigerant and a condenser **4** to condense the compressed refrigerant. In the machine room **2** is provided a defrost water storage part **9** to store defrost water defrosted by a defrost heater **52**.

[0039] The main storage room **13** is disposed at an upper part of the main body cabinet **10**, and includes a freezer **14** and a cooler **15** divided by a main partition **19** in a horizontal direction.

[0040] The main partition **19** is formed through a foaming process which forms an insulating layer between the outer casing **12** and the inner casing of the main body cabinet **10**.

[0041] The evaporators **23**, **25** comprise a first evaporating part **23** disposed at the main body cabinet **10** to cool the main storage room **13**, a second evaporating part **25** disposed at the main body cabinet **10** to be apart from the first evaporating part **23** to cool the auxiliary storage room **16**, and a refrigerant moving pipe **50** connecting the first and the second evaporating parts **23**, **25**. The first and second evaporating parts **23**, **25** and the refrigerant moving pipe **50** are formed with one evaporating pipe without welding joints.

[0042] The refrigerant moving pipe **50** comprises a first refrigerant moving pipe **50***a* provided between the first and second evaporating parts **23**, **25** so that the refrigerant passing through one area of the first evaporating part **23** is transferred to the second evaporating part **25**, and a second refrigerant moving pipe **50***b* provided between the first and second evaporating parts **23**, **25** so that the refrigerant passing through the second evaporating part **25** from the first refrigerant moving pipe **50***a* is transferred to the other area of the first evaporating part **23**.

[0043] The first evaporating part **23** comprises a freezer evaporating part **26** and a cooler evaporating part **27** to cool the freezer **14** and the cooler **15**, respectively.

[0044] The freezer evaporating part **26** and the cooler evaporating part **27** are respectively disposed at a rear area of an inside of the freezer **14** and the cooler **15**, and a freezer duct **31** and a cooler duct **32** are respectively disposed at a front of the freezer evaporating part **26** and the cooler evaporating part **27**.

[0045] In the freezer evaporating part **26** is disposed the defrost heater **52**, so that frost formed at the freezer evaporating part **26** is removed. In the cooler evaporating part **27** is disposed the defrost heater (not shown), so that frost formed at the cooler evaporating part **27** is removed.

[0046] In **FIGS. 2 and 3**, the defrost water defrosted by the defrost heater **52** is discharged through a defrost water discharging duct **48** to a defrost water storage part **9**.

[0047] The ducts **30**, **40** comprise a first duct **30** corresponded to the first evaporating part **23** and formed with a cooling air pathway of the first evaporating part **23**, and a second duct **40** corresponded to the second evaporating part **25** and formed with a cooling air pathway of the second evaporating part **25**.

[0048] The first duct **30** comprises the freezer duct **31** and the cooler duct **32** corresponded to the freezer evaporating part **26** and the cooler evaporating part **27** to form the cooling air pathway.

[0049] Inside of the freezer duct **31** is disposed a ventilating fan **35** to forcibly ventilate the cooling air generated from the freezer evaporating part **26** to the freezer **14**. An upper side of the freezer duct **31** is disposed a freezer branch duct **33** connected with the freezer duct **31** to allow the cooling air generated from the freezer evaporating part **26** to be branched.

[0050] A freezer cooling air inlet **31***a* is formed in a lower surface of the freezer duct **31** so that the cooling air passes through the freezer **14** to be flowed into the freezer evaporating part **26**.

[0051] A plurality of freezer cooling air outlets **33***a* are provided in the freezer branch duct **33** so that the cooling air is exhausted toward the freezer **14**. Herein, the cooling air outlets **33***a* are formed in the freezer branch duct **33**.

[0052] Alternatively, the freezer cooling air outlets **33***a* may be formed in the freezer duct **31**. Further, the freezer branch duct **33** may be integrally formed with the freezer duct **31**.

[0053] Inside of the cooler duct **32** is disposed a ventilating fan **36** to forcibly ventilate the cooling air generated from the cooler evaporating part **27** to the cooler **15**. An upper side of the cooler duct **32** is disposed a cooler branch duct **34** connected with the cooler duct **32** to allow the cooling air generated from the cooler evaporating part **27** to be branched.

[0054] A cooler cooling air inlet **32***a* is formed in a lower surface of the cooler duct **32** so that the cooling air passes through the cooler **15** to be flowed into the cooler evaporating part **27**.

[0055] A plurality of cooler cooling air outlets **34***a* are provided in the cooler branch duct **34** so that the cooling air is exhausted toward the cooler **15**. Herein, the cooling air outlets **34***a* are formed in the cooler branch duct **34**. Alternatively, the cooling air outlets **34***a* may be formed in the cooler duct **32**. Further, the cooler branch duct **34** may be integrally formed with the cooler duct **32**.

[0056] The auxiliary storage room **16** comprises a predetermined temperature range set to cool from cooling temperature to freezing temperature. The auxiliary storage room **16** comprises the temperature range of approximately 25° C. to 10° C., for example. Generally, the auxiliary storage room **16** is smaller than the main storage room **13**. The auxiliary storage room **16** is disposed at a lower part of the main body cabinet **10** and divided with the main storage room **13** in up and down by the separating partition **20**. The auxiliary storage room **16** comprises a left side auxiliary storage room **17** and a right side auxiliary storage room **18** divided from side to side according as the main partition **19** is extended downward.

[0057] The second evaporating part **25** comprises a left side auxiliary evaporating part **28** connected with the freezer evaporating part **26** to cool the left side auxiliary storage room **17**, and a right side auxiliary evaporating part **29** connected with the cooler evaporating part **27** to cool the right side auxiliary storage room **18**.

[0058] In **FIG. 4**, the first refrigerant moving pipe **50***a* of the refrigerant moving pipe **50** is provided between the freezer evaporating part **26** and the left side auxiliary evaporating part **28** so that the refrigerant passing through the one area of the freezer evaporating part **26** is transferred to the left auxiliary evaporating part **28**. The second refrigerant moving pipe **50***b* of the refrigerant moving pipe **50** is provided between the freezer evaporating part **26** and the left side auxiliary evaporating part **28** so that the refrigerant passing through the left side auxiliary evaporating part **28** from the first refrigerant moving pipe **50***a* is transferred to the other area of the freezer evaporating part **26**.

[0059] The left side auxiliary evaporating part **28** is connected with the freezer evaporating part **26** by the refrigerant moving pipe **50**, thereby being integrally provided with the freezer evaporating part **26**. Therefore, the refrigerant can move between the left side auxiliary evaporating part **28** and the freezer evaporating part **26** by the refrigerant moving pipe **50**. A separating tray **47** is disposed between the freezer evaporating part **26** and the left side auxiliary evaporating part **28** so as to separate the cooling air of the freezer evaporating part **26** and the left side auxiliary evaporating part **28**.

[0060] The separating tray **47** is disposed at a space between the freezer evaporating part **26** and the left side auxiliary evaporating part **28** to separate the freezer evaporating part **26** and the left side auxiliary evaporating part **28**,

thereby preventing the cooling air generated from the freezer evaporating part **26** and the left side auxiliary evaporating part **28** from being mixed each other. Therefore, it prevents smell of food of the freezer **14** and the left side auxiliary storage room **17** from being mixed. Further, the separating tray **47** receives the defrost water formed by the defrost heater **52**. The defrost water received by the separating tray **47** is discharged through the defrost water discharging duct **48** to the defrost water storage part **9** provided in the machine room **2**, and the defrost water stored in the defrost water storage part **9** is removed by evaporation and the like.

[**0061**] The right side auxiliary evaporating part **29** is connected with the cooler evaporating part **27** by the refrigerant moving pipe **50** (see **FIG. 6**), thereby being integrally provided with the cooler evaporating part **27**. Therefore, the refrigerant can move between the right side auxiliary evaporating part **29** and the cooler evaporating part **27** by the refrigerant moving pipe **50**. A separating tray **45** is disposed between the cooler evaporating part **27** and the right side auxiliary evaporating part **29** so as to separate the cooling air of the cooler evaporating part **27** and the right side auxiliary evaporating part **29**.

[**0062**] The separating tray **45** such like the separating tray **47** separates the cooler evaporating part **27** and the right side auxiliary evaporating part **29**, thereby preventing the smell of food of the cooler **15** and the right side auxiliary storage room **18** from being mixed. Further, the separating tray **45** receives the defrost water formed by the defrost heater of the cooler evaporating part **27** and the received defrost water is connected to the machine room **2**, thereby being evaporated.

[**0063**] Herein, the defrost heaters **52** are disposed at the left side auxiliary evaporating part **28** and the right side auxiliary evaporating part **29** respectively, thereby removing the frost formed at the freezer evaporating part **26** and the cooler evaporating part **27**. Further, the defrost trays **48**, **46** receiving the defrost water may be disposed at the lower area of the left side auxiliary evaporating part **28** and the right side auxiliary evaporating part **29** respectively. Therefore, the defrost water received in the defrost trays **48**, **46** is connected to the machine room **2** to be evaporated.

[**0064**] The separating partition **20** comprises a freezer separating partition **21** dividing the freezer **14** and the left side auxiliary storage room **17** in a vertical direction, and a cooler separating partition **22** dividing the cooler **15** and the right side auxiliary storage room **18** in a vertical direction.

[**0065**] In **FIG. 3**, the freezer separating partition **21** is detachably coupled with the freezer duct **31** and the left side auxiliary duct **41**. Herein, as an alternative, the freezer duct **31** may be integrally formed with the left side auxiliary duct **41**. A rear end part of the freezer separating partition **21** is coupled with a coupling part **77** of the freezer duct **31** and the left side auxiliary duct **41** which are integrally formed. A front end part of the freezer separating partition **21** is seated on a freezer seating part **78** formed at the inner casing **11** of the main body cabinet **10** and the main partition **19**. Therefore, the freezer separating partition **21** is detachable with respect to the main body cabinet **10**, thereby disposing the freezer evaporating part **26** and the left side auxiliary evaporating part **28** which are integrally formed, and the freezer duct **31** and the left side auxiliary duct **41** which are integrally formed, and next, disposing the freezer separating partition **21** at the main body cabinet **10**. Herein, a gasket (not shown) may be coupled with circumferences of the freezer separating partition **21** to divide and seal the freezer **14** and the left side auxiliary storage room **17**.

[**0066**] In **FIG. 2**, the cooler separating partition **22** is detachably coupled with the cooler duct **32** and the right side auxiliary duct **42**. Herein, the cooler duct **32** is integrally formed with the right side auxiliary duct **42**. A rear end part of the cooler separating partition **22** is coupled to a coupling part **75** of the cooler duct **33** and the right side auxiliary duct **42** which are integrally formed. A front end part of the cooler separating partition **22** is seated on a cooler seating part **76** formed at the inner casing **11** of the main body cabinet **10** and the main partition **19**. Therefore, the cooler separating partition **22** is detachable with respect to the main body cabinet **10**, thereby disposing the cooler evaporating part **27** and the right side auxiliary evaporating part **29** which are integrally formed, and the cooler duct **32** and the right side auxiliary duct **42** which are integrally formed, and disposing the freezer separating partition **21** at the main body cabinet **10**. Herein, a gasket (not shown) may be coupled with circumferences of the cooler separating partition **22** to divide and seal the cooler **15** and the right side auxiliary storage room **18**.

[**0067**] The second duct **40** comprises a left side auxiliary duct **41** and a right side auxiliary duct **42** which are corresponded to the left side auxiliary evaporating part **28** and the right side auxiliary evaporating part **29** to form the cooling air pathway.

[**0068**] In **FIG. 3**, inside of the left side auxiliary duct **41** is disposed a ventilating fan **43** to forcibly ventilate the cooling air generated from the left side auxiliary evaporating part **28** to the left side auxiliary storage room **17**. In an upper surface of the left side auxiliary duct **41** is formed a left side auxiliary cooling air outlet **41***a* to exhaust the cooling air generated from the left side auxiliary evaporating part **28** to the left side auxiliary storage room **17**, and in a lower surface thereof is formed a left side auxiliary cooling air inlet **41***b* to input the exhausted cooling air passing through the left side auxiliary storage room **17** into the left side auxiliary duct **41**.

[**0069**] In **FIG. 2**, inside of the right side auxiliary duct **42** is disposed a ventilating fan **44** to forcibly ventilate the cooling air generated from the right side auxiliary evaporating part **29** to the right side auxiliary storage room **18**. In an upper surface of the right side auxiliary duct **42** is formed a right side auxiliary cooling air outlet **42***a* to exhaust the cooling air generated from the right side auxiliary evaporating part **29** to the right side auxiliary storage room **18**, and in a lower surface thereof is formed a right side auxiliary cooling air inlet **42***b* to input the exhausted cooling air passing through the right side auxiliary storage room **18** into the right side auxiliary duct **42**.

[**0070**] In **FIG. 5**, the refrigerator **1** further comprises the compressor **3**, the condenser **4** to condense the refrigerant compressed from the compressor **3**, a converting valve **7** to supply the refrigerant supplied from the condenser **4** to at least one of the freezer evaporating part **26** and the cooler evaporating part **27**, and a connecting refrigerant duct **8** to connect an outlet side of the cooler evaporating part **27** and an inlet side of the freezer evaporating part **26** so as to supply the refrigerant discharged from the cooler evaporating part **27** to the freezer evaporating part **26**.

[**0071**] The converting valve **7** may selectively supply the refrigerant supplied from the condenser **4** to the cooler

evaporating part **27** or the freezer evaporating part **26**, alternatively, may be provided in a three-way valve to supply the refrigerant to both the cooler evaporating part **27** and the freezer evaporating part **26**. Further, the converting valve **7** may close up path for both the cooler evaporating part **27** and the freezer evaporating part **26**. A first capillary duct **5** and a second capillary duct **6** are respectively provided between the converting valve **7** and the cooler evaporating part **27** and between the converting valve **7** and the freezer evaporating part **26** for decompressing the refrigerant.

[**0072**] The main door **60** comprises a freezer door **61** to rotatably open/close the freezer **14**, and a cooler door **62** to rotatably open/close the cooler **15**.

[**0073**] The auxiliary door **70** comprises a left side auxiliary door **71** to slidably open/close the left side auxiliary storage room **17**, and a right side auxiliary door **72** to slidably open/close the right side auxiliary storage room **18**.

[**0074**] With this configuration, a cooling cycle of the refrigerator **1** according to an embodiment of the present invention will be described with reference to **FIG. 5** as following.

[**0075**] When the refrigerant of a gas phase which is compressed by a high temperature and a high pressure at the compressor **3** is flowed into the condenser **4**, the condenser **4** condenses the refrigerant of the gas phase in the high temperature and the high pressure into the refrigerant of a liquid phase. The liquefied refrigerant is depressurized through the first capillary duct **5** to be flowed into the cooler evaporating part **27**. Then the refrigerant is depressurized through the second capillary duct **6** to be flowed the freezer evaporating part **26**. Herein, the converting valve **7** selectively converts the pathway of the refrigerant to the cooler evaporating part **27** or the freezer evaporating part **26**. At this time, the refrigerant is flowed into the left side auxiliary evaporating part **28**, since the freezer evaporating part **26** is connected with the left side auxiliary evaporating part **28** by the refrigerant moving pipe **50**, so that the freezer evaporating part **26** and the left side auxiliary evaporating part **28** generate the cooling air by heat exchange with the freezer **14** and the left side auxiliary storage room **17** respectively. Similarly, the refrigerant is flowed into the right side auxiliary evaporating part **29**, since the cooler evaporating part **27** is connected with the right side auxiliary evaporating part **29** by the refrigerant moving pipe **50**, so that the cooler evaporating part **27** and the right side auxiliary evaporating part **29** generate the cooling air by heat exchange with the cooler **15** and the right side auxiliary storage room **18** respectively. After that, the refrigerant cooling each storage room is again flowed into the compressor **3**.

[**0076**] With this configuration, the process that the evaporator and the duct are assembled in the freezer **14** and the left side auxiliary storage room **17** will be described as following.

[**0077**] First of all, a worker separates the freezer separating partition **21** from the main body cabinet **10** so that the freezer **14** and the left side auxiliary storage room **17** are connected. In case the freezer duct **31** and the left side auxiliary duct **41** are disposed at the main body cabinet **10**, the freezer duct **31** and the left side auxiliary duct **41** are separated from the main body cabinet **10**.

[**0078**] Then, the worker installs the freezer evaporating part **26** and the left side auxiliary evaporating part **28** which are integrally formed, at the freezer **14** and the left side auxiliary storage room **17**. At this time, an inlet **26***a* and an outlet **26***b* of the freezer evaporating part **26** are connected to an outlet side of the converting valve **7** and the connecting refrigerant duct **8** by a welding and the like. The freezer evaporating part **26** and the left side auxiliary evaporating part **28** are fastened to the inner casing **11** receiving the freezer evaporating part **26** and the left side auxiliary evaporating part **28** by screws and the like. The freezer duct **31** and the left side auxiliary duct **41** formed integrally are coupled to the front of the freezer evaporating part **26** and the left side auxiliary evaporating part **28**, and then the freezer branch duct **33** is assembled in the upper part of the freezer duct **31**. At this time, the ventilating fans **35**, **43** are respectively disposed at the freezer duct **31** and the left side auxiliary duct **41** to be adjacent to the freezer evaporating part **26** and the left side auxiliary evaporating part **28**. Alternatively, the ventilating fans **35**, **43** are disposed at the inner casing **11** to be adjacent to the freezer evaporating part **26** and the left side auxiliary evaporating part **28** respectively.

[**0079**] Finally, the worker couples an one end of freezer separating partition **21** to the coupling part **77** of the freezer duct **31** and the left side auxiliary duct **41** which are integrally formed, and seats the other end thereof on the seating part **78** formed at the inner casing **11** of the main body cabinet **10** and the main partition **19**, thereby completing the assembling.

[**0080**] Therefore, the freezer evaporating part **26** and the left side auxiliary evaporating part **28** are integrally formed with the one refrigerant pipe, thereby being connected with each other. After the freezer evaporating part **26** and the left side auxiliary evaporating part **28** integrally formed are disposed at the freezer **14** and the left side auxiliary storage room **17**, only two point of the inlet **26***a* and the outlet **26***b* of the freezer evaporating part **26** are weld, thereby enhancing efficiency of work in comparison to four point welding in case of the conventional refrigerator.

[**0081**] Similarly, the process that the evaporator and the ducts are assembled at the refrigerator **15** and the right side auxiliary storage room **18** is the same with the foregoing case.

[**0082**] The inlet **26***a* and the outlet **26***b* of the freezer evaporating part **26** are connected to the outlet side of the converting vale **7** and the connecting refrigerant duct **8** by the welding and the like.

[**0083**] In the foregoing embodiment, the freezer duct and the left side auxiliary duct are integrally formed, alternatively, is detachably coupled.

[**0084**] In the foregoing embodiment, the cooler duct and the right side auxiliary duct are integrally formed. Alternatively the cooler duct and the right side auxiliary duct may be detachably coupled together.

[**0085**] Although a few embodiments of the present invention have been shown and described, it would be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles and spirit of the invention, the scope of which is defined in the claims and their equivalents.

What is claimed is:

1. A refrigerator, comprising:

a main body cabinet having a first storage room and a second storage room to be divided with the first storage room and respectively cooled;

an evaporator having a first evaporating part disposed at the main body cabinet and cooling the first storage room, a second evaporating part disposed at the main body cabinet to be apart from the first evaporating part and cooling the second storage room, and a refrigerant moving pipe connecting the first and second evaporating parts; and

a duct for guiding cooling air generated by the first and second evaporating parts to the first and second storage rooms to respectively cool the first and second storage rooms,

wherein the first and second evaporating parts and the refrigerant moving pipe are formed with one evaporating pipe.

2. The refrigerator according to claim 1, wherein the refrigerant moving pipe comprises:

a first refrigerant moving pipe provided between the first and second evaporating parts so that the refrigerant passing through one area of the first evaporating part is transferred to the second evaporating part; and

a second refrigerant moving pipe provided between the first and second evaporating parts so that the refrigerant passing through the second evaporating part from the first refrigerant moving pipe is transferred to the other area of the first evaporating part.

3. The refrigerator according to claim 2, further comprising:

a separating partition detachably coupled with the main body cabinet to divide between the first and second storage rooms.

4. The refrigerator according to claim 3, wherein the duct comprises a first duct disposed at the main body cabinet and forming a cooling air pathway of the first evaporating part, and a second duct disposed at the main body cabinet and forming a cooling air pathway of the second evaporating part; and

the separating partition is coupled with at least one of the first duct and the second duct.

5. The refrigerator according to claim 4, further comprising:

a coupling part supporting a rear end part of the separating partition on a central area of the first and second ducts, and wherein the first duct is integrally provided with the second duct.

6. The refrigerator according to claim 5, further comprising a seating part provided in a front area of the main body cabinet and placed between the first and second storage rooms to support a front end part of the separating partition.

7. The refrigerator according to claim 1, further comprising a separating tray provided in a space between the first and second evaporating parts to prevent the cooling air generated from the first and second evaporating parts from being mixed each other.

8. The refrigerator according to claim 7, further comprising:

a defrost heater for defrosting the first evaporating part, and wherein the separating partition receives defrost water defrosted by the defrost heater.

9. The refrigerator according to claim 4, wherein the first and second storage rooms are divided in the main body cabinet in a vertical direction by the separating partition.

10. A manufacturing method of a refrigerator having a first storage room and a second storage room to be divided with the first storage room and respectively cooled, the method comprising:

providing an evaporator having a first evaporating part and a second evaporating part to be apart from each other to respectively cool the first and second storage rooms, and a refrigerant moving pipe connecting the first and second evaporating parts;

providing a separating partition detachably coupled with the main body cabinet to divide between the first and second storage rooms;

disposing the evaporator at the main body cabinet so that the first and second evaporating parts correspond to the first and second storage rooms in a state that the separating partition is separated from the main body cabinet; and

disposing the separating partition at the main body cabinet to divide between the first and second storage rooms.

11. The manufacturing method according to claim 10, wherein the first evaporating part and the second evaporating part, and the refrigerant moving pipe are formed with one evaporating pipe without joints.

12. The manufacturing method according to claim 10, further comprising disposing a separating tray at a space of the first and second evaporating parts to prevent cooling air generated from the first and second evaporating parts from being mixed each other.

13. The manufacturing method according to claim 12, further comprising:

providing a duct detachably coupled inside the first and second storage rooms; and

disposing the duct at the main body cabinet so that the duct is mounted to a front of the evaporator.

14. The manufacturing method according to claim 13, further comprising providing a coupling part supporting a rear end part of the separating partition on the duct.

15. The manufacturing method according to claim 14, further comprising providing a seating part in a front area of the main body cabinet placed between the first and second storage rooms to support the front end part of the separating partition.

16. A refrigerator comprising:

a first storage room and a second storage room to respectively store food therein;

a first evaporator and a second evaporator to supply cooling air for the first storage room and the second storage room, respectively;

a separating tray positioned between the first evaporator and the second evaporator to separate the cooling air supplied to the first storage room and the second storage room, respectively.

17. The refrigerator of claim 16, further comprising:

a refrigerant moving pipe to connect the first evaporator and the second evaporator to each other, and to flow refrigerant therebetween.

18. The refrigerator of claim 16, wherein the first storage room and the second storage room are divided in a vertical direction.

19. The refrigerator of claim 17, further comprising a first duct and a second duct corresponding to the first storage room and the second storage room, respectively, to supply the cooling air supplied from the first evaporator and the second evaporator into the first storage room and the second storage room, respectively.

20. The refrigerator of claim 19, wherein the first duct and the second duct are integrally formed together.

21. The refrigerator of claim 19, further comprising a separating partition to divide the first storage room from the second storage room, wherein the separating partition is detachably coupled with the first and the second duct.

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