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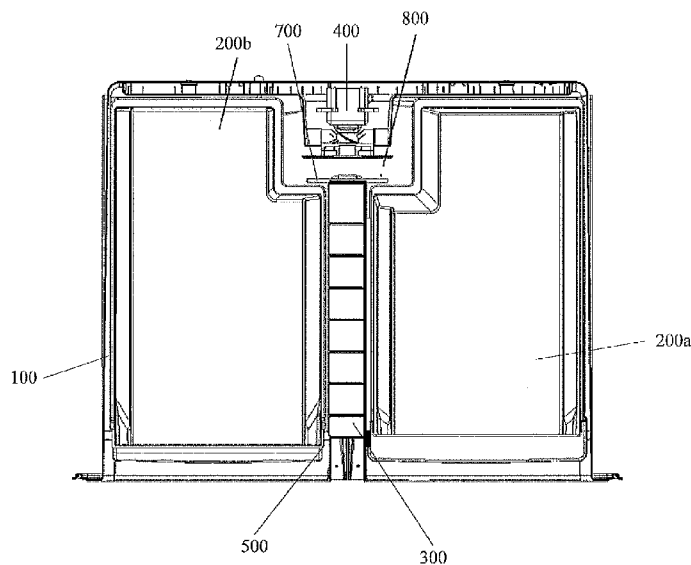


Figure 3

(57) Abstract: The present invention discloses an air supply system for a compartment of a refrigerator, comprising: a fan provided on a rear wall of an inner chamber of the compartment, said fan is provided with an air inlet and an air outlet, said air inlet faces an open side of said compartment, and said air outlet and said air inlet are in communication with each other; and a barrier, which is provided in front of said air inlet, and there is a gap between said barrier and said air inlet. By providing the barrier, vortex caused by backflow of cool air in the clearance can be prevented, short circuit of air field can be avoided, smooth flowing of air flow can be achieved and refrigeration effect of the compartment of the refrigerator can be enhanced. The present invention further provides a refrigerator further comprising the air supply system, said air supply system is fitted in said compartment. This enhances refrigeration efficiency of the compartment of the large-capacity refrigerator, achieves even air supply, avoids short circuit of air field and reduces temperature difference in the large-capacity refrigerator.

5 **Refrigerator and Air Supply System for Compartment of Refrigerator**

FIELD OF THE INVENTION

10 The present invention relates to refrigerator technical field, in particular to an air supply system for a compartment of a refrigerator.

BACKGROUND ART

15 With gradual improvement of people's life level, people's requirement on refrigerator capacity also increases gradually, thus, a large-capacity refrigerator is produced by refrigerator manufacturer. As transverse width of the large-capacity refrigerator is larger than transverse width of a small-capacity refrigerator, an air supply system of the small-capacity refrigerator has difficulty in satisfying cool air feed requirement of the large-
20 capacity refrigerator.

As space of an inner chamber of a compartment of the large-capacity refrigerator is relatively large, drawers or other accommodating means are generally provided in the compartment of the refrigerator, and these accommodating means are generally placed in
25 a stacked manner. Conventional air supply system is simplex and only applies to the compartment of the small-capacity refrigerator. For the compartment of the large-capacity refrigerator provided with the accommodating means, the conventional air supply system causes easily obstructive air supply, occurrence of vortex, short circuit of air field and so on. This causes uneven temperature distribution in the inner chamber of the compartment
30 such that relatively large temperature difference exists, refrigeration efficiency is reduced and food decays relatively quickly.

The Chinese patent application No.200610015411.3 discloses a cool air supply mechanism capable of supplying substantially evenly cool air to meat food stored in a
35 drawer-type refrigerating box, thus solving problem in respect of uneven cool air supply in the drawer-type refrigerating box. However, one aspect of current attention focus of designer is how to design an air feed system suitable for the large-capacity refrigerator so

- 5 as to avoid short circuit of air field, enhance refrigeration efficiency and develop broad market for the large-capacity refrigerator.

CONTENT OF THE INVENTION

- 10 The technical problems to be solved by the present invention is to enhance refrigeration efficiency of the compartment of the large-capacity refrigerator, achieve even air supply, avoid short circuit of air field and reduce temperature difference in the large-capacity refrigerator.
- 15 To solve the above problems, the present invention provides an air supply system for a compartment of a refrigerator, comprising:
a fan provided on a rear wall of an inner chamber of the compartment, said fan is provided with an air inlet and an air outlet, said air inlet faces an open side of said compartment, and said air outlet and said air inlet are in communication with each other; and
20 a barrier, which is provided in front of said air inlet, and there is a gap between said barrier and said air inlet.

Optionally, said barrier is fitted on a top wall of the inner chamber of said compartment.

- 25 Optionally, at least two rows of drawers are placed in a horizontal direction of the inner chamber of said compartment, there is a clearance between the respective rows, and fitting position of the fan corresponds to a part of the clearance.

- Optionally, an intermediate separating plate is provided in said clearance so as to divide
30 said compartment into two storage rooms.

Optionally, said intermediate separating plate is provided with a vent, and is provided with a metal plate at one end adjacent to the open side of said compartment.

- 35 Optionally, said barrier is fitted on the top wall of the inner chamber of said compartment or is fitted on one end of said intermediate separating plate facing said fan.

5 Optionally, the air supply system further comprises an evaporator, said evaporator is located at a rear wall of the inner chamber of said compartment and below said fan, and is in communication with said air inlet.

10 Optionally, the air supply system further comprises an air duct plate, said air duct plate comprises a first side plate adapted to be cooperatively fitted with the rear wall of the inner chamber of said compartment and a second side plate adapted to be cooperatively fitted with the top wall of the inner chamber of said compartment; said first side plate is provided with an air return opening at one end adjacent to a bottom wall of the inner chamber of said compartment; and an air feed opening is provided on said second side plate.

15 Optionally, there is a first cool air duct between said second side plate and the top wall of the inner chamber of said compartment, and said first cool air duct is in communication with said air outlet.

20 Optionally, an edge of said first cool air duct is provided with a sealing strip.

The present invention further provides a refrigerator comprising a compartment, the refrigerator further comprises the air supply system, and said air supply system is fitted in the inner chamber of said compartment.

25 Optionally, an inner wall of said compartment is provided with a first fitting structure, and said air supply system is provided with a second fitting structure adapted to be fitted with said first fitting structure.

30 Optionally, said first fitting structure and said second fitting structure are a fitting hole.

In contrast to the prior art, the present invention has following advantages:

35 In the air supply system, the aim of arrangement of the fan on the rear wall of the inner chamber of the compartment is to achieve better air supply so as to keep food fresh. The fan is provided with the air inlet and the air outlet, the air inlet faces the open side of the compartment and the air outlet and the air inlet are in communication with each other,

5 thereby, a complete air supply system is formed such that air flow forms a closed circuit in the compartment.

The barrier is provided in front of the air inlet and there is the gap between said barrier and said air inlet. As a result, this can prevent backflow of cool air causing vortex and
10 short circuit of air field.

As volume of the compartment of the large-capacity refrigerator is relatively high, at two rows of draws are placed in the horizontal direction of the inner chamber of the compartment, and there is the clearance between the respective rows, and fitting position
15 of the fan corresponds to a part of the clearance. This not only increases flow passage of air flow so as to facilitate ventilation, but also can permit convenient storage of items so as to keep items orderly.

The intermediate separating plate is provided in said clearance so as to divide said
20 compartment into two storage rooms. Said intermediate separating plate is provided with the vent, and is provided with the metal plate at one end adjacent to the open side of said compartment. The division of the compartment into small storage rooms by the intermediate separating plate is advantageous to cause air flow to flow and circulate, and the metal plate can abut against the door body of the refrigerator as so to achieve good
25 sealing.

Said barrier is fitted on the top wall of the inner chamber of said compartment or is fitted on one end of said intermediate separating plate facing said fan. This can not only save a fitting space of the barrier, but also make fitting process convenient and simple so as to
30 reduce production cost for manufacturer. The barrier is generally fixed at the top wall of the inner chamber of the compartment, which can save fitting space of the barrier.

The air supply system further comprises the evaporator. Said evaporator is located at the rear wall of the inner chamber of said compartment and below said fan, and is in
35 communication with said air inlet. The evaporator absorbs heat from air flow so as to achieve better refrigeration and keep food fresh.

5 The air supply system further comprises the air duct plate. Said air duct plate comprises the first side plate adapted to be cooperatively fitted with the rear wall of the inner chamber of said compartment and the second side plate adapted to be cooperatively fitted with the top wall of the inner chamber of said compartment; said first side plate is provided with the air return opening at one end adjacent to the bottom wall of the inner chamber of
10 said compartment; and the air feed opening is provided on said second side plate. The first cool air duct between said second side plate and the top wall of the inner chamber of said compartment is in communication with said air outlet. The air duct plate has a guiding function and forms a flowing passage for air flow to provide a circulation circuit for air flow such that cool air can be supplied continuously to the inner chamber of the compartment.
15 To ensure good sealing, the edge of the first cool air duct is generally provided with the seal strip.

The present invention further provides a refrigerator comprising the compartment and further comprising the above air supply system, wherein, the air supply system is fitted in
20 the inner chamber of the compartment to achieve air supply to the compartment.

An inner wall of said compartment is provided with a first fitting structure, and said air supply system is provided with a second fitting structure adapted to be fitted with said first fitting structure. This can facilitate removal and fitting of the air supply system and reduce
25 difficulty of fitting steps. Said first fitting structure and said second fitting structure are a fitting hole, thus, such a fitting structure has simple manufacture process and decreased manufacture cost for manufacturer.

BRIEF DESCRIPTION OF THE DRAWINGS

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Figure 1 is an elevation view of a compartment of a refrigerator;

Figure 2 is a left side sectional view of a compartment of a refrigerator according to the prior art and corresponding air flow distribution;

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Figure 3 is a top view of a compartment of a refrigerator fitted with an air supply system according to an embodiment of the present invention;

- 5 Figure 4 is a left side sectional view of the compartment of the refrigerator fitted with the air supply system according to the embodiment of the present invention and corresponding air flow distribution.

DETAILED DESCRIPTION OF THE INVENTION

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The present invention provides an air supply system for a compartment of a refrigerator, which enhances refrigeration efficiency of air supply of a compartment of a large-capacity refrigerator, and avoids some problems such as short circuit of air field, uneven air supply and large temperature difference.

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A main idea of the present invention is that said air supply system comprises: a fan provided on a rear wall of an inner chamber of said compartment, said fan is provided with an air inlet and an air outlet, said air inlet faces an open side of said compartment, and said air outlet is in communication with said air inlet; and a barrier, said barrier is provided in front of said air inlet and there is a gap between said barrier and said air inlet.

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The technical solutions in embodiments of the present invention will be clearly and wholly described hereinafter with reference to the drawings of the embodiments of the present invention. Obviously, the described embodiments are only some of the embodiments of the present invention, but not all embodiments. All of other embodiments obtained by a person skilled in the art without any inventive efforts based on the disclosed embodiments of the present invention fall within a protection scope of the present invention.

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As at least two rows of drawers are generally placed in a horizontal direction in the compartment of current large-capacity refrigerator, and there is a clearance between the respective rows. For the above configuration, the inventive air supply system has relatively good air cool effect. Therefore, description will be made hereinafter by way of example, but the inventive air supply system is not limited to the below description. Said air supply system comprises at least a fan and a barrier. Said fan is provided at a part of the rear wall of the inner chamber of said compartment corresponding to said clearance, and is provided with the air inlet and the air outlet. Said air inlet faces the open side of said compartment, and said air outlet is in communication with said air inlet; the barrier is

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- 5 provided in front of said air inlet, and there is the gap between said air inlet and said barrier.

Figure 1 is an elevation view of a compartment of a refrigerator, wherein, the compartment of the refrigerator is marked with 100, and a fan is marked with 400. Generally, at least
10 two rows of drawers are placed in a horizontal direction in the compartment 100. There is a clearance 500 between the respective rows. Said drawers comprises drawers 200a , 200b , 200c, wherein, the drawers 200b and 200c are overlapped as a row, and the drawer 200a is arranged as a sole row. The above rows of drawers are arranged side by side, and an intermediate separating plate 300 is provided in the clearance 500, thus
15 the compartment 100 is divided into two small storage rooms.

Figure 2 is a left side sectional view of a compartment of a refrigerator according to the prior art and corresponding air flow distribution. In the case of the compartment 100 shown in figure 1 be regarded as a normal use state, the compartment 100 is divided into
20 two left, right structures along a vertical bisector of transverse length of the compartment 100. As the two left, right structures are similar in function and principle, illustration is given in figure 2 by taking a left view of the right structure as an example. Arrow direction in figure 2 is flowing direction of air flow in the compartment 100.

- 25 The present invention principally overcomes problems in the prior art. The problems in the prior art will be described hereinafter in conjunction with figures 1 and 2.

As shown in figure 1, as transverse width of compartment of large-capacity refrigerator is larger than transverse width of compartment of small-capacity refrigerator, at least two
30 rows of drawers are generally placed in the horizontal direction in the inner chamber of the compartment 100. There is a clearance 500 between the respective rows. This is not only convenient for depositing items, but also permits air flow to circulate through the clearance 500 and enlarges range of air duct, therefore good refrigeration effect is achieved.

- 35 After the fan 400 begins to work, negative pressure will be generated in the vicinity of the fan, and air is forced to flow in the inner chamber of the compartment 100, therefore, as shown by arrow A in figure 2, backflow of cool air generally occurs through the clearance

5 500 and thus resulting in short circuit of air field. As the drawers are provided in the inner chamber of the compartment 100 (as shown in figure 1), cool air circulates and flows along reserve space between the drawers. As the negative pressure in the vicinity of the fan 400 is maximal, it is difficult to avoid the backflow of the cool air through the clearance 500. Furthermore, the back-flowed cool air meets follow-up circulating cool air in the
10 vicinity of the fan 400, as a result, the air duct is obstructed and short circuit of air field occurs.

To solve the above problems, the present invention designs an air supply system for the compartment having such a configuration which has good refrigeration effect. Figure 3 is a
15 top view of the compartment of the refrigerator fitted with the air supply system according to the present invention. Figure 3 clearly shows fitting relationship of individual constitutional structures of said air supply system. Figure 4 is a left side sectional view of the compartment of the refrigerator fitted with the air supply system according to the embodiment of the present invention and corresponding air flow distribution. The air
20 supply system for the compartment of the refrigerator provided by the present invention will be described in detail hereinafter in conjunction with figures 1, 3 and 4.

As is well known, in an air supply system, negative pressure is generated usually by rotation of the fan to reinforce air flowing in the inner chamber of the compartment. With
25 reference to figure 3, the air supply system provided by the present invention comprises a fan 400 and a barrier 700, wherein, the fan 400 is provided at a part of the rear wall of the inner chamber of the compartment 100 corresponding to the clearance 500, and is provided with an air inlet and an air outlet. The air inlet faces the open side of the compartment 100, and the air outlet is in communication with the air inlet and usually
30 faces the rear wall of the inner chamber of the compartment 100; the barrier 700 is provided in front of the air inlet, and there is a gap 800 between the barrier and the air inlet.

With reference to figures 3 and 4, the barrier 700 is fitted in front of the air inlet of the fan, and there is the gap 800 between the barrier and the air inlet. The barrier 700 interrupts
35 passage between the clearance 500 and the air inlet of the fan 400. That is to say, in the prior art, there is a communication path between the fan 400 and the clearance 500 (as shown in figures 1 and 2). In the present invention, the barrier 700 is added and fitted

5 behind the intermediate separating plate 300, thereby obstructing the passage between the clearance 500 and the fan 400 (as shown in figure 3). It is known from the above description that the barrier 700 obstructs the passage between the clearance 500 and the fan 400. Therefore, air flow in the clearance 500 has difficulty in backflow into the air inlet of the fan 400. Thus, this effectively avoids problems in that vortex occurs due to the
10 backflow of the cool air and short circuit of air field is caused.

Continuing to make reference to figures 3 and 4, there is the gap 800 between the air inlet of the fan 400 and the barrier 700, which not only ensures a flowing passage of air flow such that the air flow can enter smoothly the air inlet through the gap 800, but also
15 reduces space in front of the fan 400. Therefore, after the fan 400 begins to rotate, negative pressure in the gap 800 is increased and air flowing in the inner chamber of the compartment 100 is reinforced.

With reference to figures 1 and 3, the fan 100 is provided with the air inlet (not shown in the figures) and the air outlet (not shown in the figures), the air inlet faces the open side of the compartment 100, and the air outlet faces the rear wall of the inner chamber of the compartment 100. The air outlet and the air inlet are in communication with each other. Thus, an air flowing passage is formed.

25 With reference to figures 1, 3 and 4, the fan 400 is opposite to the clearance 500, the air inlet faces the open side of the compartment 100 (as shown in figure 1). Therefore, it is difficult to avoid suction of a part of cool air into the fan 400 from the clearance 500 after the fan 100 begins to rotate. As a result, it is easy not only to cause vortex in air field so as to increase air flow resistance, but also to cause short circuit of air field so as to
30 generate uneven air field.

To avoid the above problems, the barrier 700 is provided in front of the air inlet, and there is the gap 800 between the barrier and the air inlet. This not only can prevent vortex caused by backflow of cool air in the clearance 500, avoid short circuit of air field and
35 reduce frictional noise caused by air flowing and noise generated by the fan itself, but also can reduce air resistance during rising of air flow and prevent unwanted heat loss.

5 Contrasting figure 2 with figure 4, as shown in figure 2, after the fan 400 begins to rotate, negative pressure is generated in the vicinity of the fan 400, thereby forcing air flow to circulate and flow in the inner chamber of the compartment 100. The fan 400 and the clearance 500 (as shown in figure 1) are in communication with each other, and according to the natural law, cool air in the clearance 500 flows toward the vicinity of the fan 400 at
10 lower gas pressure (as shown in figure 2). As air flow in the compartment 100 also flows toward the fan 400 according to the natural law, the cool air flows back from the clearance 500, as shown by the arrow A, and meet other air flow in front of the fan 400. As a result, this not only easily causes vortex and short circuit of air field, but also causes unwanted heat loss and reduction of refrigeration effect of the compartment 100.

15 As shown in figure 4, the barrier 700 is provided in front of the air inlet of the fan 400 and there is the gap 800 between the barrier and the air inlet. The barrier 700 limits generation space of negative pressure, and limits generation range of negative pressure within the gap 800. Therefore, it is relatively difficult for the cool air in the clearance 500 to flow back.
20 As the gap 800 exists such that the cool air flows into the air inlet of the fan 400 along the gap 800, there is no influence on flowing of air flow in the inner chamber of the whole compartment 100.

That is to say, the barrier 700 limits the range of negative pressure generated by rotation
25 of the fan 400 within the gap 800 and forms an obstruction at one end of the clearance 500 such that cool air has difficulty in backflow from the clearance 500. As the range of negative pressure is limited, larger pressure difference can be generated in the gap 800, thereby forcing warm air to move upwardly continuously and increasing air circulation power.

30 In general, the intermediate separating plate 300 is provided in the clearance 500 so as to divide the compartment 100 into two storage rooms, in order to increase space utilization ratio of the compartment 100. Moreover, usage of the intermediate separating plate 300 can also reduce air resistance to a certain extent. The intermediate separating plate 300 is
35 provided with a vent (not shown in the figures), and is provided with a metal plate (not shown in the figures) at one end adjacent to the open side of the compartment 100. This facilitates flowing and circulation of air flow. Moreover, abutment of the metal plate against a door body of the refrigerator can achieve good sealing.

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To facilitate fitting and manufacturing, the barrier 700 is usually fitted on a top wall of the inner chamber of the compartment 100. The barrier 700 is generally a square plastic plate, and side length of the square is slightly larger than the diameter of the air inlet.

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When fitting, an upper end of the barrier 700 is anchored by a rivet or fixed by a screw and/or a bolt onto the top wall. In certain cases, as desired, the barrier can also be fixed by welding.

15

For the compartment 100 fitted with the intermediate separating plate 300, the barrier 700 can be fitted on the top wall of the inner chamber of the compartment 100, or fitted on one end of the intermediate separating plate 300 facing the fan 400 (as shown in figure 3), or fitted on both the top wall of the inner chamber of the compartment 100 and the one end of the intermediate separating plate 300 facing the fan 400. This not only saves fitting space of the barrier 700, but also achieves relatively firm fitting. Thus, it is not easy for the barrier 700 to shake and is advantageous to reduce air friction. In actual manufacture, shape, material and fitting manner of the barrier 700 are not limited to the above mentioned embodiments.

20

To enhance further refrigeration effect of the air supply system, the air supply system further comprises an evaporator (not shown in the figures) which is located at the rear wall of the inner chamber of the compartment 100 and under the fan 400, and is in communication with the air inlet.

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In general, the evaporator is fitted at outside of the inner chamber of the compartment 100 to reduce fitting space required by the evaporator. The fan 400 is generally located above the evaporator. When the fan 400 rotates, negative pressure is generated in the vicinity of the evaporator, which promotes air circulation and accelerates air flow. Refrigerant, such as Freon etc., is contained in the evaporator at low temperature and low pressure. When warmer air passes through the evaporator, it exchanges heat with the evaporator so as to transfer the heat to the evaporator such that it becomes into cool air at low temperature to enter the air inlet of the fan 400, and then enters the inner chamber of the compartment 100 through the air outlet of the fan 400. As a result, the compartment 100 is cooled by the cool air to keep food fresh.

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5 That is to say, the fan 400 is fitted on the rear wall of the inner chamber of the compartment 100 at a position which generally exactly faces the clearance 500 and is adjacent to the top wall of the inner chamber of the compartment 100. The fan 400 is provided with the air inlet and the air outlet. The air inlet generally also faces the clearance 500, the air outlet generally faces the rear wall of the inner chamber of the compartment 100, and the air inlet and the air outlet are in communication with each other. This complies with air dynamics principles. With reference to figure 4, cool air in the inner chamber of the compartment 100 becomes into warm air after circulation in the inner chamber of the compartment 100, and the warm air flows toward the vicinity of the rear wall of the inner chamber of the compartment 100 and exchanges heat with the evaporator so as to become into cool air.

As density of the warm air is relatively low such that it will move upwardly according to the nature laws, it flows toward the rear upper part of the inner chamber of the compartment 100. The fan 400 is fitted above the evaporator and suck cool air, such that negative pressure above the evaporator is increased, flow velocity of the warm air is enhanced and air circulation is accelerated.

As shown in figure 1, two rows of means or containers for storing items, such as drawer, tray (not shown in the figures), moisture preservation cover plate (not shown in the figures) and so on, are generally provided in the inner chamber of the compartment 100, and each row has at least one container, such as drawers 200a, 200b, drawer 200c, etc. When the containers are placed such that there is a certain space between the respective containers, a flowing passage is provide for air flow. Cool air generated by cooling effect of the evaporator (not shown in the figures) flows in the space, and when it flows through food, it exchange heat with food to keep food fresh.

Therefore, the above fitting manner of the evaporator and the fan 400 not only saves required fitting space, but also complies with air dynamic principles. Rotation of the fan 400 generates negative pressure in the upper part of the inner chamber of the compartment 100 such that flow of air exchanging heat with the evaporator is enhanced and air flowing is promoted in the inner chamber of the compartment 100.

5 To increase or reduce air ducts in the inner chamber of the compartment 100, an air duct plate (not shown in the figures) is further provided. The air duct plate comprises a first side plate and a second side plate. The first side plate is adapted to be cooperatively fitted on the rear wall of the inner chamber of the compartment 100, the second side plate is adapted to be cooperatively fitted on the top wall of the inner chamber of the compartment
10 100, and the first side plate and the second side plate are connected into L-shape. The first side plate is provided with an air return opening at one end adjacent to a bottom wall of the inner chamber of the compartment 100. An air feed opening is provided on the second side plate. Warm air enters from the air return opening, and cool air flows into the inner chamber of the compartment 100 from the air feed opening so as to feed air.

15 A first cool air duct for cool air flow is formed between the second side plate and the top wall of the inner chamber of the compartment 100. In actual manufacture, a certain reserve space (hereinafter known as second cool air duct) is generally formed between the first side plate and the rear wall of the inner chamber of the compartment 100. A
20 process of warm air exchanging heat with the evaporator so as to form cool air occurs in the second cool air duct. The cool air formed by heat exchange flows into the air inlet of the fan 400. As the air inlet and the air outlet of the fan 400 are in communication with each other and the first cool air duct is in communication with the air outlet of the fan 400, the cool air flows into the first cool air duct and finally enters the inner chamber of the
25 compartment 100 by the air feed opening located on the second side plate. To ensure sealing of the first cool air duct, a seal strip is provided at an edge of the first cool air duct.

The air duct plate can not only provide flowing passages for the cool air and the warm air such that the cool air enters directly the inner chamber of the compartment 100 to keep
30 food fresh, but also prevent heat exchange between the cool air and the warm air, waste of energy and reduction of refrigeration effect. In actual manufacture, type and number of the air duct plate may be changed as desired, but are not limited to the above exemplary embodiment.

35 The present invention further provides a refrigerator, comprising a compartment and further comprising the above-mentioned air supply system to be fitted on an inner wall of the compartment. By the air supply system, for large-capacity refrigerator, the refrigerator

- 5 has increased refrigeration efficiency and problems of short circuit of air field, uneven air supply and large temperature difference are also avoided.

The inner wall of the compartment is provided with a first fitting structure and the air supply system is provided with a second fitting structure adapted to be fitted with the first
10 fitting structure. The first fitting structure and the second fitting structure all are a fitting hole. In this case, fixation is achieved by fitting a screw or bolt, even a rivet into the fitting hole. For such a fitting structure, its manufacturing is easy, and its manufacture cost is reduced for the manufacturer, thus it will be highly praised by the manufacturer.

- 15 In actual manufacture, it is also possible that the first fitting structure is a latch hook and the second fitting structure is a latch slot; or, the first fitting structure is a latch slot and the second fitting structure is a latch hook. The latch hook is hooked into the latch slot so as to achieve fixing of the air duct means in the inner chamber of the compartment, and removal can be achieved by simply removing the latch hook from the latch slot. The above
20 fitting structure is simple and easily operable, thereby satisfying customer's needs and having a better market prospect.

Arrangement forms of the first fitting structure and the second fitting structure do not affect the essential of the present invention. Rather, manufacturer or designer can freely design
25 and manufacture as desired.

- The description of the disclosed embodiments enables a person skilled in the art to carry out or use the present invention. The various modifications to the embodiments is obvious to a person skilled in the art, and without departing from the spirit or scope of the present
30 utility model, the general principle defined therein can be carried out in other embodiments. Accordingly, the scope of the present invention is not limited to the embodiments described herein, but the broadest scope consistent with the principle and novel characteristics disclosed by the present utility model is claimed.

5 CLAIMS

1. An air supply system for a compartment of a refrigerator, characterized in that the air supply system comprises:

10 a fan provided on a rear wall of an inner chamber of the compartment, said fan is provided with an air inlet and an air outlet, said air inlet faces an open side of said compartment, and said air outlet and said air inlet are in communication with each other; and a barrier, which is provided in front of said air inlet, and there is a gap between said barrier and said air inlet.

15 2. The air supply system as claimed in claim 1, characterized in that said barrier is fitted on a top wall of the inner chamber of said compartment.

3. The air supply system as claimed in claim 1, characterized in that at least two rows of drawers are placed in a horizontal direction of the inner chamber of said compartment, 20 there is a clearance between the respective rows, and fitting position of the fan corresponds to a part of the clearance.

4. The air supply system as claimed in claim 3, characterized in that an intermediate separating plate is provided in said clearance so as to divide said compartment into two 25 storage rooms.

5. The air supply system as claimed in claim 4, characterized in that said intermediate separating plate is provided with a vent, and is provided with a metal plate at one end adjacent to the open side of said compartment.

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6. The air supply system as claimed in claim 4, characterized in that said barrier is fitted on the top wall of the inner chamber of said compartment or is fitted on one end of said intermediate separating plate facing said fan.

35 7. The air supply system as claimed in any one of claims 1-6, characterized in that the air supply system further comprises an evaporator, said evaporator is located at a rear wall of the inner chamber of said compartment and below said fan, and is in communication with said air inlet.

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8. The air supply system as claimed in claim 7, characterized in that the air supply system further comprises an air duct plate, said air duct plate comprises a first side plate adapted to be cooperatively fitted with the rear wall of the inner chamber of said compartment and a second side plate adapted to be cooperatively fitted with the top wall of the inner chamber of said compartment; said first side plate is provided with an air return opening at one end adjacent to a bottom wall of the inner chamber of said compartment; and an air feed opening is provided on said second side plate.

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9. The air supply system as claimed in claim 8, characterized in that there is a first cool air duct between said second side plate and the top wall of the inner chamber of said compartment, and said first cool air duct is in communication with said air outlet.

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10. The air supply system as claimed in claim 9, characterized in that an edge of said first cool air duct is provided with a sealing strip.

11. A refrigerator comprising a compartment, characterized in that the refrigerator further comprises the air supply system as claimed in any one of claims 1-10, said air supply system is fitted in the inner chamber of said compartment.

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12. The refrigerator as claimed in claim 11, characterized in that an inner wall of said compartment is provided with a first fitting structure, and said air supply system is provided with a second fitting structure adapted to be fitted with said first fitting structure.

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13. The refrigerator as claimed in claim 12, characterized in that said first fitting structure and said second fitting structure are a fitting hole.

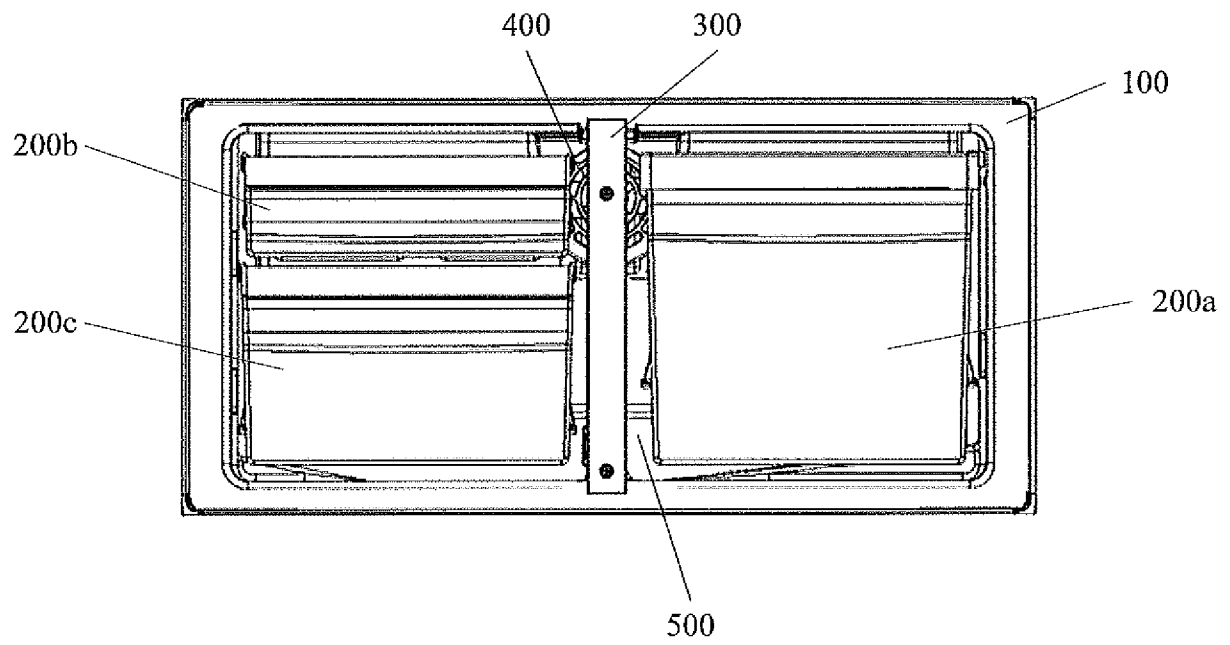


Figure 1

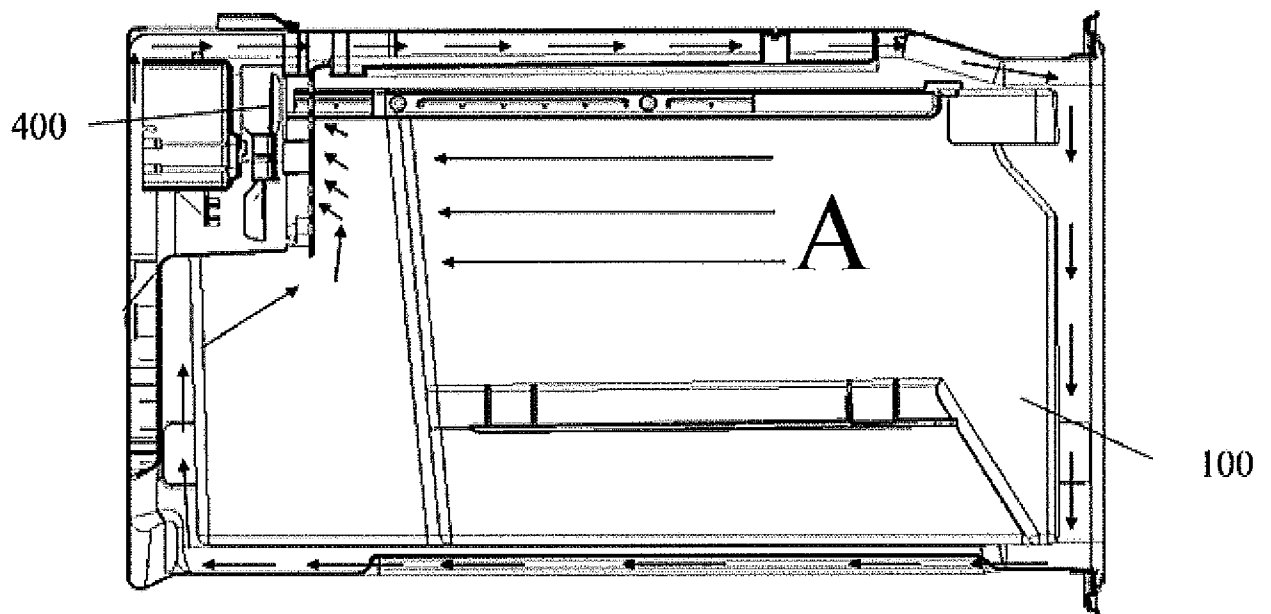


Figure 2

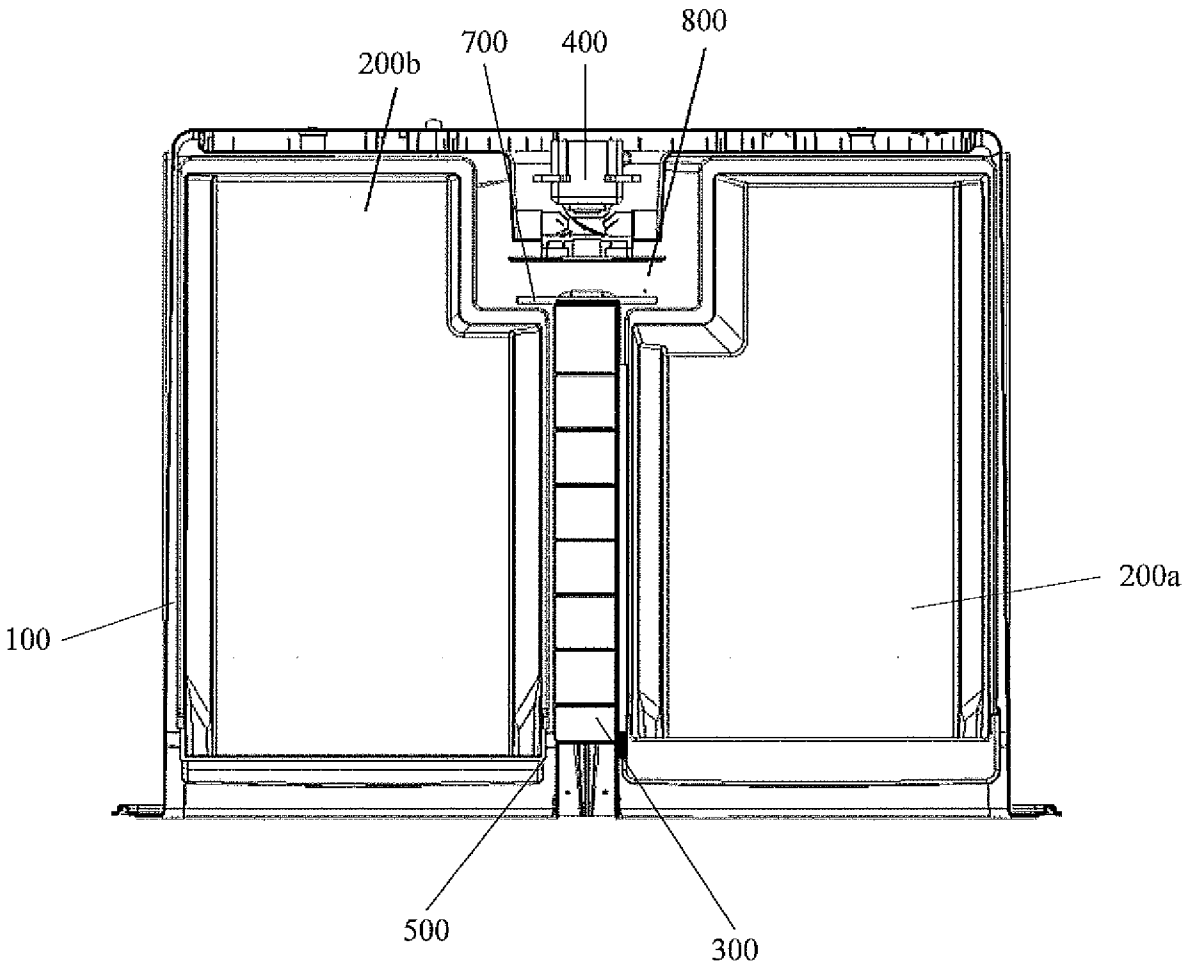


Figure 3

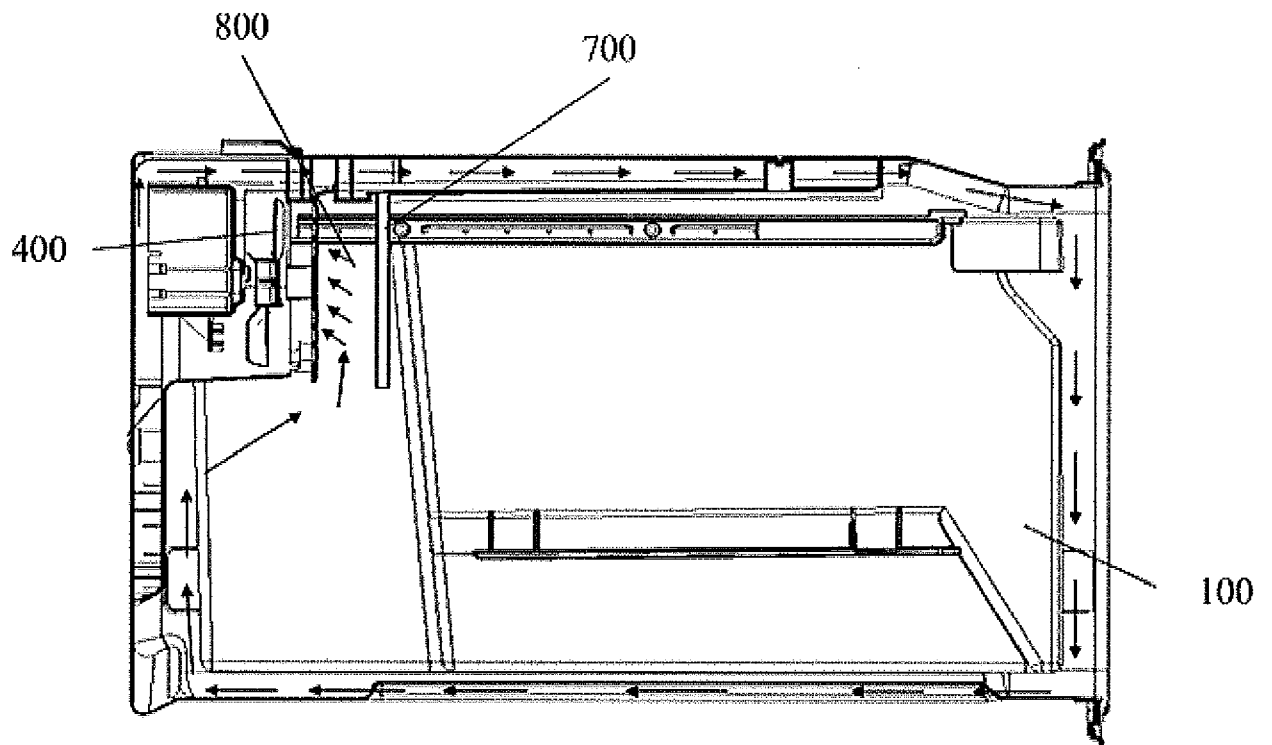


Figure 4