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(71) Applicant: **SAMSUNG ELECTRONICS CO., LTD.**
Gyeonggi-do, 442-742 Suwon-si (KR)

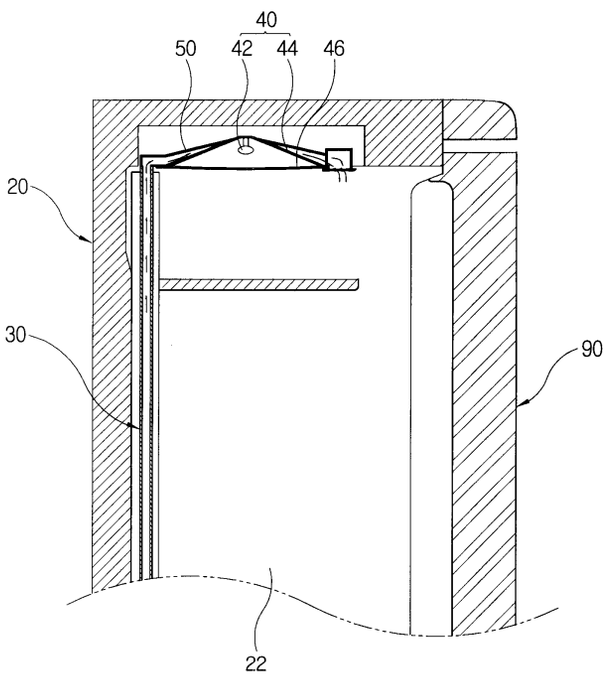
(72) Inventors:
- **Chae, Jong-Eun**
  Buk-ku Kwangju City (KR)
- **Shin, Youn-Tae**
  Kwangju City (KR)

(74) Representative: **Read, Matthew Charles et al**
Venner Shipley LLP
20 Little Britain
London EC1A 7DH (GB)

(54) REFRIGERATOR

(57) A refrigerator comprises a main body (20) formed with a storing compartment (22); a first cool air duct (30) provided in a rear of the main body (20); a lamp unit (40) which is mounted in an upper part of the main body and provided with a lamp (42) and a lamp case (44); and a second cool air duct (50) which is formed in an upper part of the lamp case to communicate with the first cool air duct (30) and allows a cool air flowing through the first cool air duct (30) to flow out toward a front of the storing compartment (22) of the main body (20).

FIG. 2



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Description

[0001] The present invention relates to a refrigerator comprising a cooling compartment and a lamp housing mounted in the roof of the cooling compartment.

[0002] Conventionally, a refrigerator is provided with a cool air duct which is formed with a cool air inflow hole and a cool air outflow hole communicating with storage compartments in order to supply and circulate cool air continuously in the storage compartments.

[0003] As shown in Figure 1, a conventional refrigerator comprises a main body 2 formed with a storage compartment 1, a cool air duct 4 which is provided at the back of the main body 2 and supplies cool air into the storage compartment 1, and a door 6 at the front of the main body 2 which provides access to the storage compartment 1.

[0004] In the conventional refrigerator described above, cool air flows out into the back of the storage compartment 1 through the cool air duct 4. This causes a temperature difference of between the front and the back of the storage compartment 1. Therefore, uniform temperature distribution cannot be maintained and cooling efficiency is lowered. This is exacerbated by opening of the door 6.

[0005] Recently, to solve the problem described above, the cool air ducting has been configured such that cool air flow out toward the front of the storage compartment. However, the configuration is complicated and a separate installation space for the cool air duct is required. Consequently, problems relating to cost and space usage efficiency are generated.

[0006] A refrigerator according to the present invention is characterised by a cool air duct extending across the lamp housing to convey cooling air towards the front of the cooling compartment.

[0007] The cool air duct is defined in part at least by structures, e.g. the walls of a channel, formed integrally on the lamp housing.

[0008] The lamp housing may comprises a bulge within which a lamp is housed. The cool air duct extends across a sloping side of said bulge and, optionally, may become shallower as it rises up the bulge; preferably, so that it does not project above said bulge.

[0009] The bulge comprises a truncated pyramid or cone.

[0010] The cool air duct can be lined with insulating material. This can prevent condensation forming on the lamp housing.

[0011] An embodiment of the present invention will now be described, by way of example, with reference to Figures 2 to 5 of the accompanying drawings, of which:

Figure 1 is a partial sectional view of a conventional refrigerator;

Figure 2 is a partial sectional view a refrigerator according to the present invention;

Figure 3 is an exploded perspective view of the lamp unit and part of the cool air duct of the refrigerator according to the present invention;

Figure 4 is a perspective view of the lamp unit and part of the cool air duct; and

Figure 5 is a sectional view illustrating the flow of cool air through the cool air duct of the refrigerator according to the present invention.

[0012] Referring to Figure 2, a refrigerator according to the present invention comprises a main body 20 formed with a storage compartment 22, a first cool air duct 30 provided at the back of the main body 20, a lamp unit 40 which is mounted in the top the main body 20 and includes a lamp 42 and a lamp case 44, and a second cool air duct 50 which is formed across the lamp case 44 and forms an extension of the first cool air duct 30 and allows a cool air flowing through the first cool air duct 30 to flow out toward the front of the storage compartment 22.

[0013] A door 90 is provided at the front of the main body 20 to provide access to the inside of the storage compartment 22.

[0014] The first cool air duct 30 defines a cool air path and guides cooled air from an evaporator (not shown) to the storage compartment 22 in order to cool the storage compartment 22. The first cool air duct 30 may have different shapes and be disposed differently from the arrangement shown in Figure 2.

[0015] The second cool air duct 50 guides cool air, flowing from the first cool air duct 30, towards the front of the storage compartment 22 and, as a result, the temperature at the front of the storage compartment 22 is lowered again relatively quickly after the door 90 has been opened and closed.

[0016] The lamp unit 40 is turned on when the door 90 is opened and turned off again when the door 90 is closed. Consequently, when a user opens the door 90, the storage compartment is illuminated for the user's convenience. A lower part of the lamp case 44 is coupled to a lamp cover 46.

[0017] Referring to Figures 3 to 5, the second cool air duct 50 extends across the lamp case 44. The second cool air duct 50 comprises according to the present invention is provided with the second cool air duct 50 comprises a channel 54 and a cover 52 mounted over the channel 54 and opens into a cool air distribution box 70 which in turn opens into the storage compartment 22.

[0018] In the present example, the channel 54 is formed integrally with the lamp case 44. However, it may be a separate component attached to the lamp case 44.

[0019] An insulating member 60 is provided in the second cool air duct 50 to prevent condensation forming on the outside of the lamp case 44 as a result of cooling of the lamp case 44 by the cool air in the second cool air duct 50. The insulating member 60 conforms to the shape of the channel 54.

[0020] Alternatively, condensation on the lamp case 44 may be prevented by forming the channel 54 itself

from suitably insulating material.

[0021] Insulation 60 may be provided in the second cool air duct 50 if it is formed separately from the lamp case 44.

[0022] The lamp case 44 has a central part in the form of a truncated pyramid. The lamp 42 is housed within the truncated pyramid. The second cool air duct 50 does not cross the summit of the truncated pyramid. Instead, it runs partly up a first slope of the truncated pyramid, across a second slope of the truncated pyramid and down a third slope opposite the first slope. The depth of the channel 54 reduces as it rises up the side of the truncated pyramid so that the top of the channel 54 does not project above the truncated pyramid.

[0023] The cool air chamber 70 is integrally formed on one side of the lamp case 44 and allows the cool air flowing through the second cool air duct 50 to flow out towards the front of the storage compartment 22. A cool air distributing member 80 preferably disperses the cool air, flowing out toward the front of the storage compartment 22, uniformly. The cool air distributing member 80 may be air shower type plate.

[0024] The lamp case 44 is connected to the lamp cover 46. A cool air inflow hole 53 is provided at the inflow end of the channel 54 so that cool air can flow into the second cool air duct 50 from the first cool air duct 30.

[0025] The cooled air the refrigerator's evaporator (not shown) flows upward through the first cool air duct 30. The cool air then flows into and through the second cool air duct 50.

[0026] The cooled air flows along the second cool air duct 50 and flows out toward the front of the storage compartment 22 via the cool air distribution box 70 and the cool air distributing member 80.

[0027] As described above, cool air is allowed to flow out towards the front of the storage compartment so that temperature distribution of a storage compartment of a main body is quickly homogenised and accordingly cooling efficiency of a refrigerator is improved.

[0028] Also, a second cool air duct is formed with a lamp unit as one body, so that space usage efficiency is relatively increased.

Claims

1. A refrigerator comprising a cooling compartment (22) and a lamp housing (44) mounted in the roof of the cooling compartment (22), **characterised by** a cool air duct (50) extending across the lamp housing (44) to convey cooling air towards the front of the cooling compartment (22).

2. A refrigerator according to claim 1, wherein the cool air duct (50) is defined in part at least by structures formed integrally on the lamp housing (44).

3. A refrigerator according to claim 2, wherein said structures comprise walls of a channel (54).

4. A refrigerator according to claim 1, 2 or 3, wherein the lamp housing (44) comprises a bulge within which a lamp (42) is housed.

5. A refrigerator according to claim 4, wherein the cool air duct (50) extends across a sloping side of said bulge.

6. A refrigerator according to claim 5, wherein the cool air duct (50) becomes shallower as it rises up the bulge.

7. A refrigerator according to claim 4 or 5, wherein the cool air duct (50) does not project above said bulge.

8. A refrigerator according to claim 5, 6 or 7, wherein the bulge comprises a truncated pyramid.

9. A refrigerator according to any preceding claim, wherein the cool air duct (50) is lined with insulating material (60).

10. A refrigerator according to any preceding claim, wherein the cool air duct (50) conveys cooling air from another cool air duct (30) extending up the back of the cooling compartment (22).

11. A refrigerator comprising:

    a main body formed with a storing compartment;
    a first cool air duct provided in a rear of the main body;
    a lamp unit which is mounted in an upper part of the main body and provided with a lamp and a lamp case; and
    a second cool air duct which is formed in an upper part of the lamp case to communicate with the first cool air duct and allows a cool air flowing through the first cool air duct to flow out toward a front of the storing compartment of the main body.

12. The refrigerator according to claim 11, wherein the second cool air duct is formed in the lamp case as one body.

13. The refrigerator according to claim 11, wherein the second cool air duct is detachably formed in the lamp case.

14. The refrigerator according to claim 11, further comprising an insulating member which is provided in the second cool air duct to prevent dewdrops from generating in an outside of the lamp case by heat exchange of the lamp and the second cool air duct.

15. The refrigerator according to claim 12, further comprising an insulating member which is provided in the second cool air duct to prevent dewdrops from generating in an outside of the lamp case by heat exchange of the lamp and the second cool air duct.

16. The refrigerator according to claim 13, further comprising an insulating member which is provided in the second cool air duct to prevent dewdrops from generating in an outside of the lamp case by heat exchange of the lamp and the second cool air duct.

17. The refrigerator according to claim 11, wherein the second cool air duct comprises an upper case and a lower case engaged to each other.

18. The refrigerator according to claim 12, wherein the second cool air duct comprises an upper case and a lower case engaged to each other.

19. The refrigerator according to claim 13, wherein the second cool air duct comprises an upper case and a lower case engaged to each other.

20. The refrigerator according to claim 17, wherein the lower case comprises an insulator to prevent the dewdrops from generating by heat exchange of the lamp and the lower case.

21. The refrigerator according to claim 18, wherein the lower case comprises an insulator to prevent the dewdrops from generating by heat exchange of the lamp and the lower case.

22. The refrigerator according to claim 19, wherein the lower case comprises an insulator to prevent the dewdrops from generating by heat exchange of the lamp and the lower case.

23. The refrigerator according to claim 11, further comprising a cool air chamber which is formed in one side of the lamp case to communicate with the second cool air duct and allows the cool air flowing through the second cool air duct to flow out toward the front of the storing compartment of the main body.

24. The refrigerator according to claim 12, further comprising a cool air chamber which is formed in one side of the lamp case to communicate with the second cool air duct and allows the cool air flowing through the second cool air duct to flow out toward the front of the storing compartment of the main body.

25. The refrigerator according to claim 13, further comprising a cool air chamber which is formed in one side of the lamp case to communicate with the second cool air duct and allows the cool air flowing through the second cool air duct to flow out toward the front of the storing compartment of the main body.

26. The refrigerator according to claim 23, further comprising a cool air distributing member which is provided in a cool air outflow hole of the cool air chamber and allows the cool air flowing out toward the front of the storing compartment of the main body through the second cool air duct to be dispersed.

27. The refrigerator according to claim 24, further comprising a cool air distributing member which is provided in a cool air outflow hole of the cool air chamber and allows the cool air flowing out toward the front of the storing compartment of the main body through the second cool air duct to be dispersed.

28. The refrigerator according to claim 25, further comprising a cool air distributing member which is provided in a cool air outflow hole of the cool air chamber and allows the cool air flowing out toward the front of the storing compartment of the main body through the second cool air duct to be dispersed.

FIG. 1
(PRIOR ART)

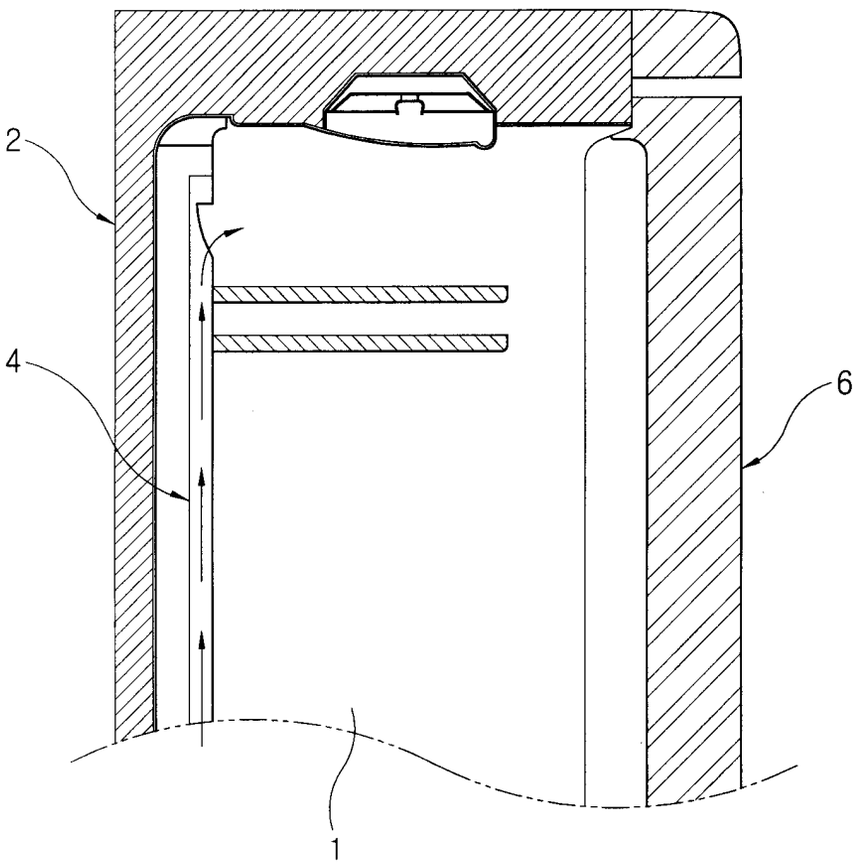

FIG. 2

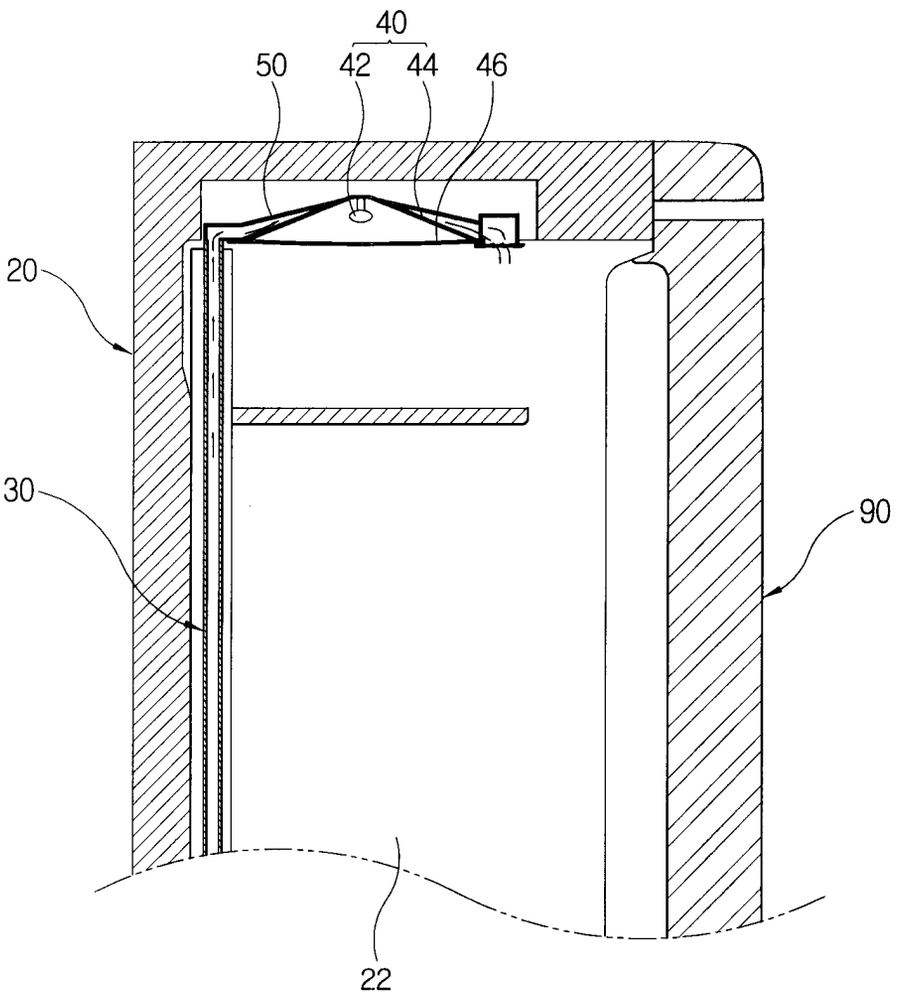

FIG. 3

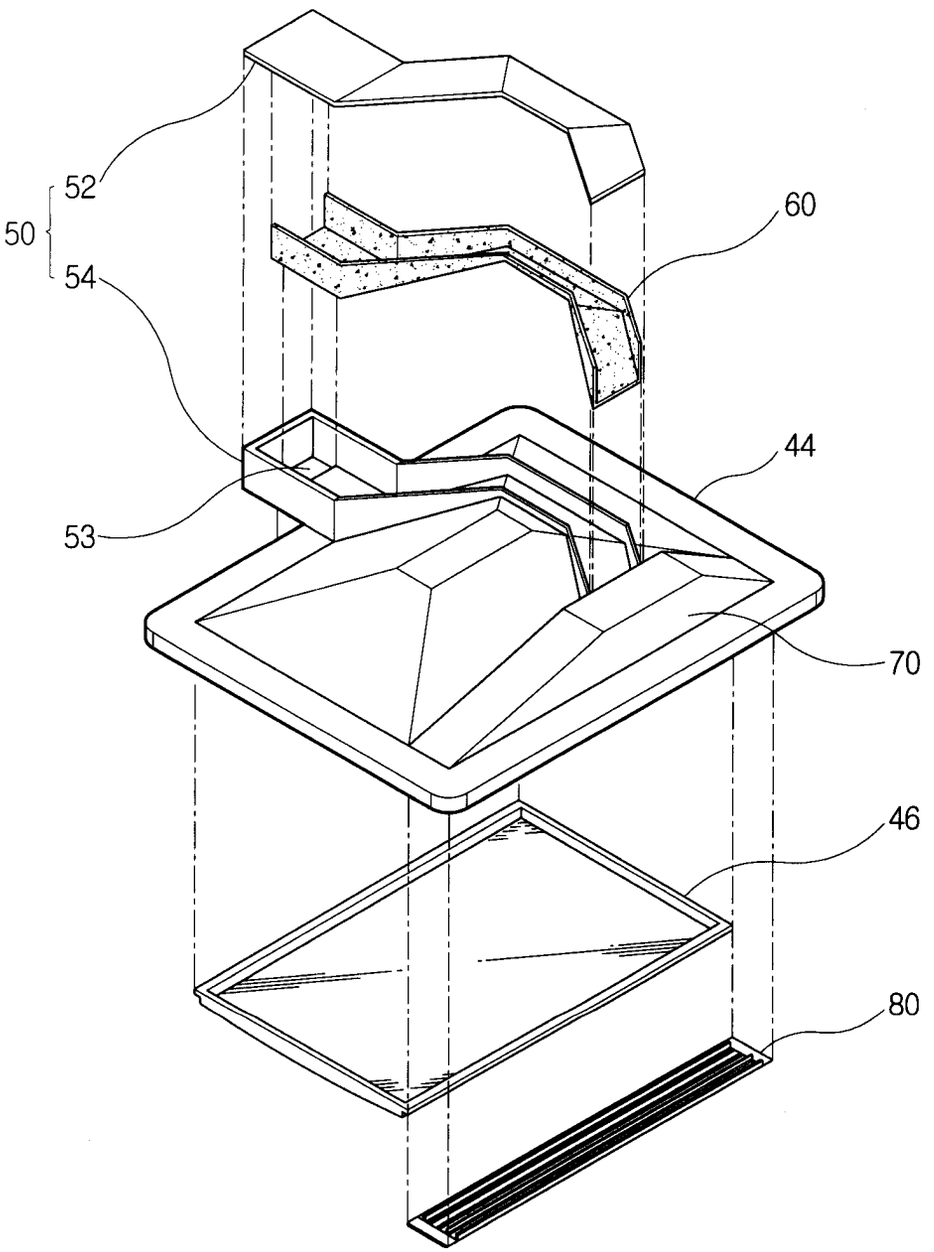

FIG. 4

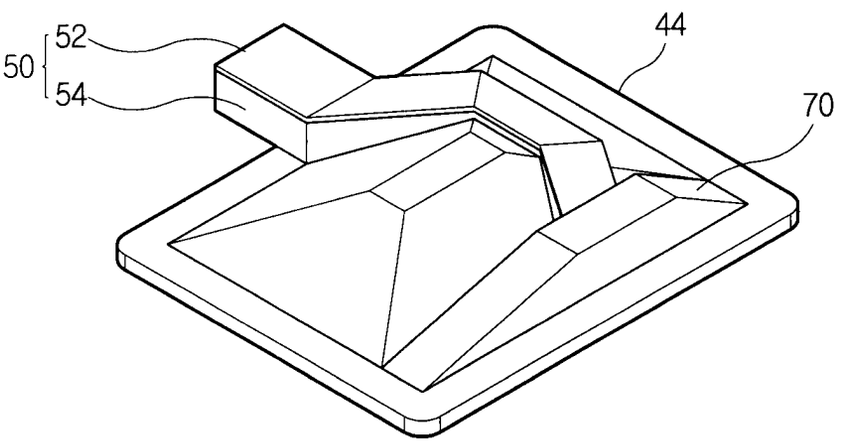

FIG. 5