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(54) **REFRIGERATOR WITH ICE MAKER**

(57) A refrigerator with an ice maker (211) comprises a freezing chamber (3), a refrigerating chamber (2), door bodies (21, 31) selectively opening and closing the refrigerating chamber (2) and the freezing chamber (3), and an ice maker (211) provided in the freezing chamber (3), the refrigerating chamber (2) or the door body (21, 31) for making ice. The ice maker (211) is connected with a refrigerating system independent from the freezing chamber (3) and the refrigerating chamber (2) so that the ice maker (211) is not affected by the refrigerating conditions of other chambers and can make ice independently.

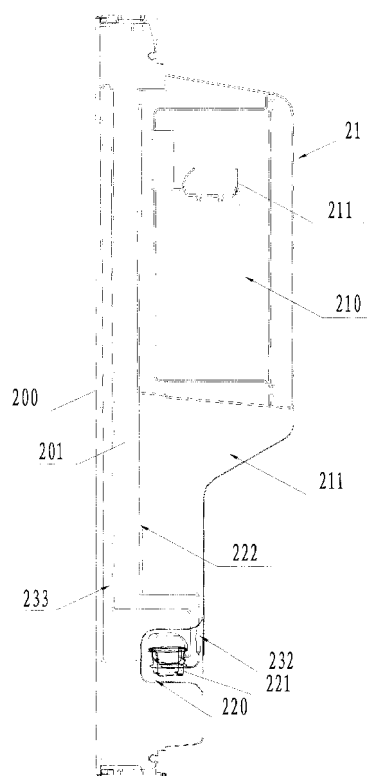


Fig.2

Description

Field of the Invention

[0001] The present invention relates to the refrigerating technical field, and in particular to a refrigerator with an ice maker.

Background of the Invention

[0002] In the prior art, cold air for making ice by a refrigerator comes from cold air generated around a freezing chamber/refrigerating chamber evaporator. The cold air around the freezing chamber/refrigerating chamber evaporator is led into an ice maker via pipes, for implementing refrigeration and the ice-making. This manner has a prominent defect, i.e. the ice maker uses evaporator(s) in other chambers of the refrigerator to implement the refrigeration and the ice-making, thereby causing excess heavy refrigerating load to the evaporator of the chamber in which it is located, which decreases the refrigerating effect of this chamber and also makes the ice maker incapable of quickly performing the refrigeration and the ice-making.

[0003] On the other hand, as the ice maker uses the evaporators of other chambers for performing the refrigeration and the ice-making, when fault occurs in a refrigerating system of other chambers, for instance, fault in the evaporator, in the compressor, etc., not only the chamber cannot perform refrigeration but also the ice maker cannot perform refrigeration and the ice-making.

Summary of the Invention

[0004] The object of the present invention is to provide a refrigerator with an ice maker independently performing refrigeration and making ice.

[0005] In order to address the above technical problem, the present invention provides a refrigerator with an ice maker, comprising:

a machine chamber having a freezing chamber and a refrigerating chamber;

a door body selectively opening and closing the refrigerating chamber and the freezing chamber; and

an ice maker provided in the freezing chamber, the refrigerating chamber or the door body, for making ice;

wherein the ice maker is connected with a refrigerating system independent from the freezing chamber and the refrigerating chamber, to form a separate cold air circulating system of the ice maker.

[0006] In the above, the door body has a cavity in which the ice maker is located; the cavity further comprises an

ice container located therein for storing the ice; the refrigerator further comprises a distributor provided in the door body for communicate with the cavity.

[0007] In the above, the refrigerating system is in the form of a compressor refrigerating system.

[0008] In the above, the refrigerating system is in the form of a semiconductor refrigerating system.

[0009] Specifically, the compressor refrigerating system comprises a compressor, a condenser, an evaporator, capillary tubes and a dry filter.

[0010] Preferably, the refrigerating system in the form of a compressor refrigerating system that comprises a compressor, a condenser, an evaporator, capillary tubes and a drier filter;

the door body further comprises another cavity in which the compressor is provided; the evaporator is provided around the ice maker to provide cold air for refrigeration.

[0011] Preferably, the another cavity is provided in a lower portion of the door body; and the cavity accommodating the ice maker is provided in an upper portion of the door body.

[0012] In the above, the condenser is provided in a lower layer of an outer surface of the door body.

[0013] In the above, a semiconductor refrigerating device of the semiconductor refrigerating system is provided around the ice maker.

[0014] In the above, the compressor refrigerating system is provided in the door body.

[0015] As the ice maker is provided with a separate refrigerating system in the present invention, it will not be affected by refrigerating conditions of other chambers and can make the ice independently.

[0016] Moreover, as the ice maker and its refrigerating system are provided on the door body, it also simplifies operation of the user for taking out ice.

[0017] On the other hand, using the semiconductor refrigerating mode greatly decreases the weight of the door body of the refrigerator, elongates the life, and reduces the space occupied by the door body.

Brief Description of the Drawings

[0018]

Figure 1 is a schematic structure diagram of the refrigerator with an ice maker according to one embodiment of the present invention; and

Figure 2 is a vertical sectional view of the door body of the refrigerating chamber according to the embodiment shown in Figure 1.

Detailed Description of Embodiments

[0019] Firstly, the principle of the present invention is illustrated briefly. In the present invention, refrigeration is performed and ice is made by providing an independent refrigerating system for the ice maker, therefore the load

of generating cold air by using other chambers can be reduced. Moreover, the function thereof does not depend upon the operational situations of other refrigerating systems of the refrigerator.

[0020] Next, the present invention will be illustrated in detail with reference to the drawings.

[0021] With reference to Figure 1, it shows a schematic structure diagram of the refrigerator with an ice maker of an embodiment of the present invention. As shown in the figure, it comprises a machine chamber 1, a freezing chamber 3, a refrigerating chamber 2 and an ice-taking opening 4.

[0022] In the above, the machine chamber 1 is divided into the freezing chamber 3 and the refrigerating chamber 2, and the ice-taking opening 4 is provided on the door body of the refrigerating chamber 2.

[0023] The refrigerating chamber 2 comprises a door body 21 and a space enclosed by the door body 21; and the freezing chamber 3 comprises a door body 31 and a space enclosed by the body 31.

[0024] With reference to Figure 2, it shows a vertical sectional view of the door body of the refrigerating chamber according to the embodiment shown in Figure 1. As shown in the figure, the door 21 comprises a first cavity 210 in the upper portion and a second cavity 220 in the lower portion.

[0025] The first cavity 210 is provided therein with an ice maker 211 (merely illustratively shown in the figure) which is provided in the top portion of the first cavity 210. The first cavity 210 is further provided with an ice distributor 212 located in the lower portion of the first cavity 210. And the ice distributor 212 is communicated with the ice-taking opening 4 in Figure 1, so as to convey ice blocks to the ice-taking opening 4 under triggering of the user after the ice maker 211 completes the ice-making.

[0026] The second cavity 220 is provided therein with a compressor 221. The door body 21 further comprises an evaporator 231, a drier filter 232 and a condenser 233.

[0027] In the above, the evaporator 231 is close to the first cavity 210, and the condenser 233 is close to an outer surface 200 of the door body 21. Particularly, the condenser 233 is located in the lower layer of the outer surface 200.

[0028] Between the evaporator 231 and the condenser 233 is a heat insulation layer 201 provided.

[0029] Between the compressor 220 and the evaporator 231 are the drier filter 232 and a capillary tube (not shown in the figure) further connected. The condenser 233 is connected to the compressor 221.

[0030] In the refrigerator with an ice maker according to another embodiment of the present invention, the ice maker is provided in the door body of the refrigerator. Moreover, a semiconductor refrigerating plate is provided around the ice maker that performs the refrigeration and makes ice by means of the semiconductor refrigerating plate. Preferably, the semiconductor refrigerating plate can be provided in the ice-making chamber where the ice maker is located. That is, taking the embodiment

as shown in Figure 2 as an example, if the semiconductor refrigerating plate is used to perform the refrigeration, the semiconductor refrigerating plate can be placed in a position in the first cavity 210 close to the ice maker 211.

[0031] As the semiconductor refrigerating plate is conventional means in the art, details will not be given herein. Use of the semiconductor refrigerating plate, on the one hand, can reduce the weight of the door body, and on the other hand can retrench the space of the door body.

[0032] In the refrigerator with an ice maker according to another embodiment of the present invention, the ice maker is provided in the freezing chamber or the refrigerating chamber of the refrigerator. Moreover, the ice maker performs the refrigeration and makes the ice by a complete set of refrigerating system of its own. The complete refrigerating system can be the existing compressor refrigerating system or semiconductor refrigerating system, etc.

[0033] As both compressor refrigerating system and semiconductor refrigerating system are well known by the person skilled in the art, their specific functions and connection manners are not further illustrated herein.

[0034] The descriptions above are only preferable embodiments of the present invention, which are not used to restrict the present invention. Any amendments, equivalent substitutions, improvements etc. within the spirit and principle of the present invention are all concluded in the scope of protection of the present invention.

Claims

1. A refrigerator with an ice maker, comprising:

- a machine chamber having a freezing chamber and a refrigerating chamber;
- a door body selectively opening and closing the refrigerating chamber and the freezing chamber; and
- an ice maker provided in the freezing chamber, the refrigerating chamber or the door body, for making ice;

characterized in that,

the ice maker is connected with a refrigerating system independent from the freezing chamber and the refrigerating chamber, to form a separate cold air circulating system of the ice maker.

2. The refrigerator according to Claim 1, **characterized in that,** the door body has a cavity in which the ice maker is located; the cavity further comprises an ice container located therein for storing the ice; the refrigerator further comprises a distributor provided in the door body for communicate with the cavity.

3. The refrigerator according to Claim 1 or 2, **characterized in that,**

terized in that, the refrigerating system is in the form of a compressor refrigerating system.

4. The refrigerator according to Claim 1 or 2, **characterized in that**, the refrigerating system is in the form of a semiconductor refrigerating system. 5
5. The refrigerator according to Claim 3, **characterized in that**, the compressor refrigerating system comprises a compressor, a condenser, an evaporator, capillary tubes and a dry filter. 10
6. The refrigerator according to Claim 2, **characterized in that**, the refrigerating system in the form of a compressor refrigerating system that comprises a compressor, a condenser, an evaporator, capillary tubes and a drier filter; 15
the door body further comprises another cavity in which the compressor is provided; the evaporator is provided around the ice maker to provide cold air for refrigeration. 20
7. The refrigerator according to Claim 6, **characterized in that**, the another cavity is provided in a lower portion of the door body; and the cavity accommodating the ice maker is provided in an upper portion of the door body. 25
8. The refrigerator according to Claim 6, **characterized in that**, the condenser is provided in a lower layer of an outer surface of the door body. 30
9. The refrigerator according to Claim 4, **characterized in that**, a semiconductor refrigerating device of the semiconductor refrigerating system is provided around the ice maker. 35
10. The refrigerator according to Claim 3, **characterized in that**, the compressor refrigerating system is provided in the door body. 40

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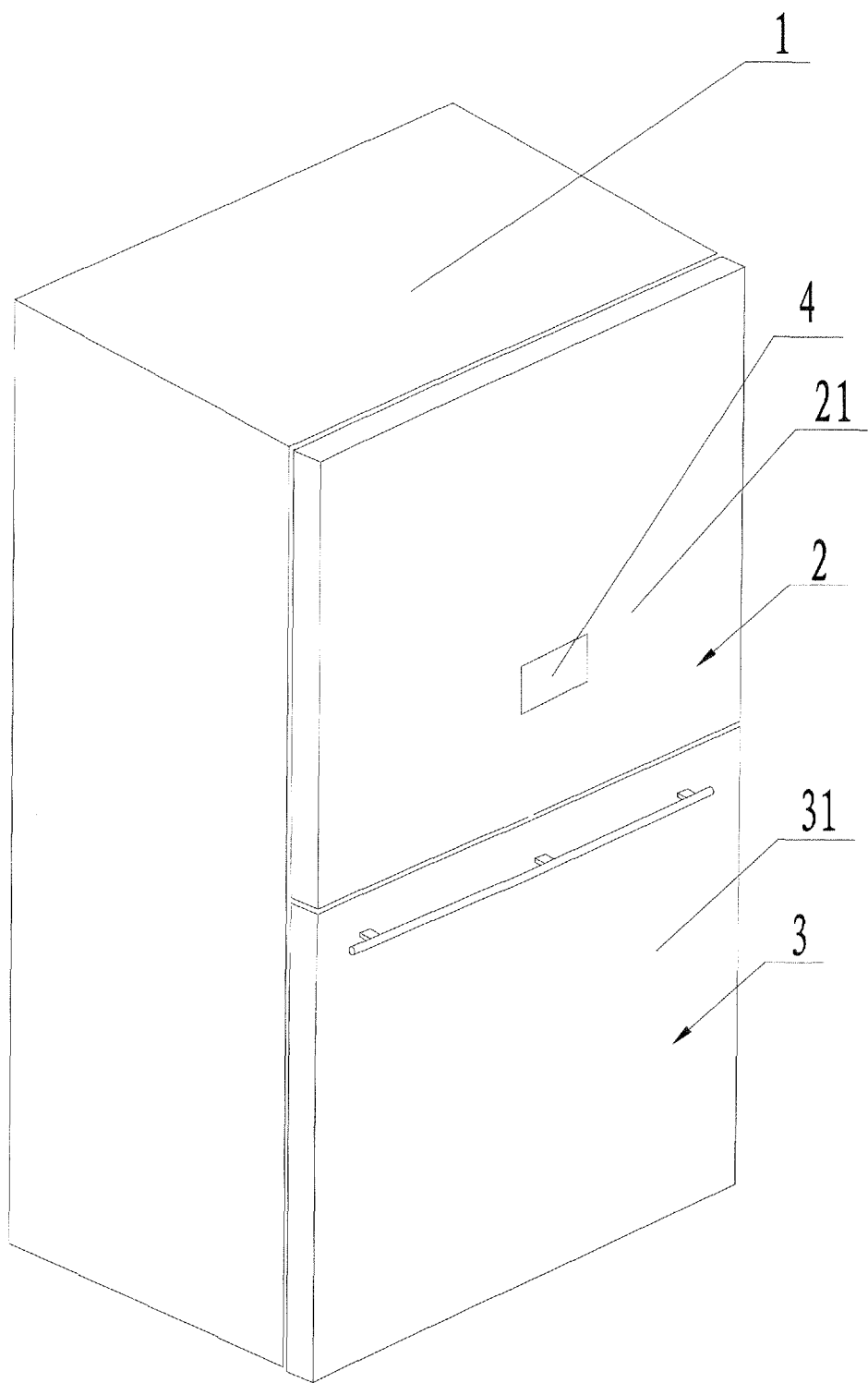


Fig.1

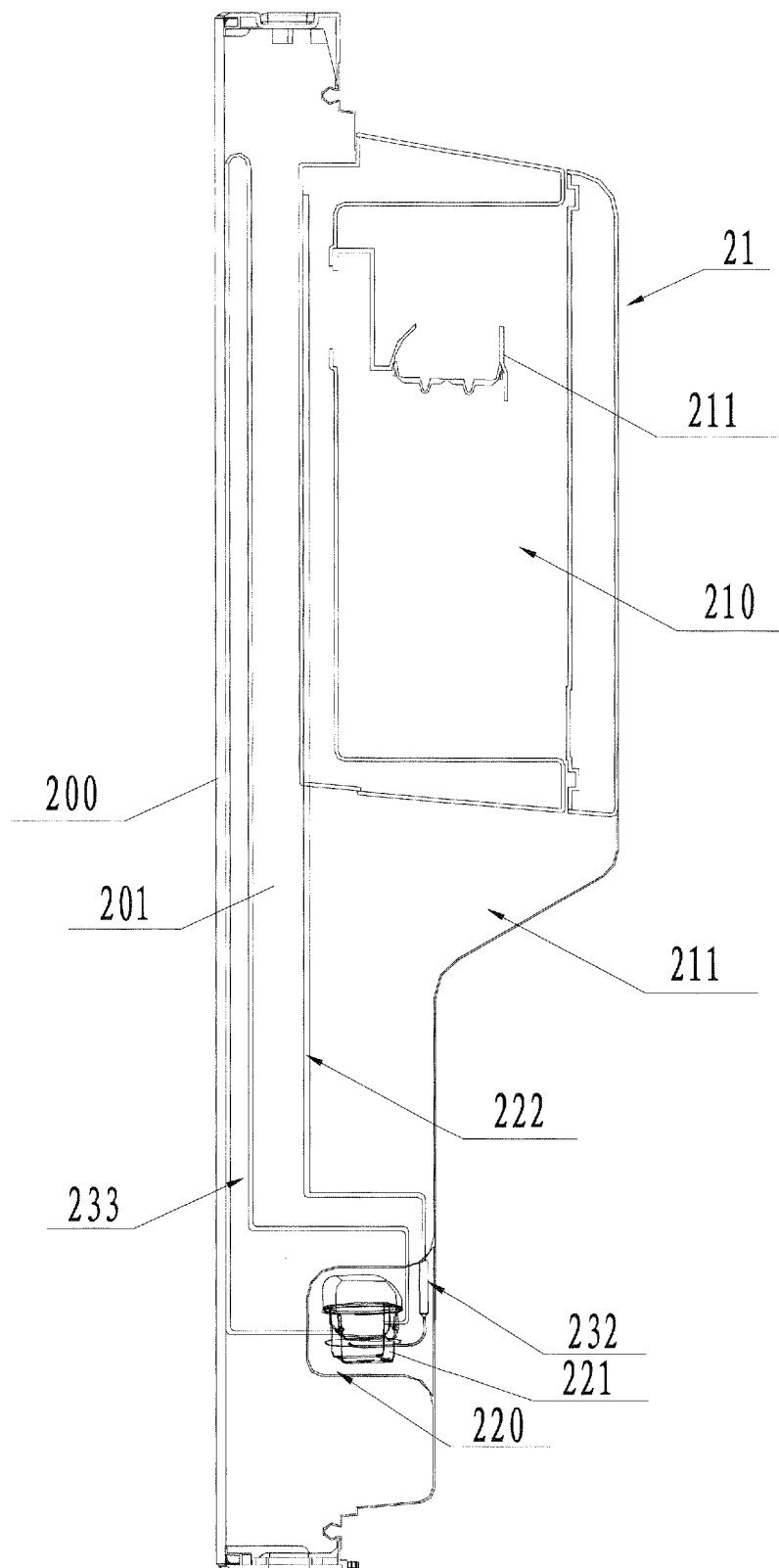


Fig.2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2009/072477

A. CLASSIFICATION OF SUBJECT MATTER		
See extra sheet		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC: F25D 11, F25C 1, F25D 23		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
CNKI, CPRS, EPODOC, WPI, PAJ: refrigerator, freezer, ice, independent, separate, individual, door		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	WO2009017282A1 (LG ELECTRONICS INC.) 05 Feb. 2009(05.02.2009) description, paragraphs 64-92, figures 6-9	1-3,10
PX	CN101315245A(Haier Group et al.) 03 Dec. 2008(03.12.2008) claims 1-10	1-10
A	US2008141699A1(RAFALOVICH et al.) 19 June 2008(19.06.2008) the whole document	1-10
A	US4003214A (SCHUMACHER) 18 Jan. 1977(18.01.1977) the whole document	1-10
A	CN1653306A(BSH BOSCH & SIEMENS HAUSGERAETE GMBH) 10 Aug. 2005(10.08.2005) the whole document	1-10
A	CN101191690A(SAMSUNG ELECTRONICS CO LTD) 04 Jun. 2008(04.06.2008) the whole document	1-10
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
<p>* Special categories of cited documents:</p> <p>“A” document defining the general state of the art which is not considered to be of particular relevance</p> <p>“E” earlier application or patent but published on or after the international filing date</p> <p>“L” document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>“O” document referring to an oral disclosure, use, exhibition or other means</p> <p>“P” document published prior to the international filing date but later than the priority date claimed</p> <p>“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>“&” document member of the same patent family</p>		
Date of the actual completion of the international search 22 Jul. 2009(22.07.2009)		Date of mailing of the international search report 06 Aug. 2009 (06.08.2009)
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451		Authorized officer LIU Chengsong Telephone No. (86-10)62084195

Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT
Information on patent family members

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Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
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Form PCT/ISA/210 (patent family annex) (April 2007)

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International application No.

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F25C 1/00 (2006.01) i