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(54) ICE MAKING APPARATUS AND REFRIGERATOR COMPRISING THE SAME

(57) An ice maker comprises a box body (1) which stores water for making ice, a rotating mechanism (3) which drives the box body (1) to rotate, a bracket (2) for supporting the box body (1) and the rotating mechanism (3), and baffles (21, 22) located above the box body (1). When water spills out due to shaking, it will be blocked and prevented by the baffles (21, 22) from spilling into the ice storage box. Moreover, the present invention further discloses a refrigerator comprising the ice maker.

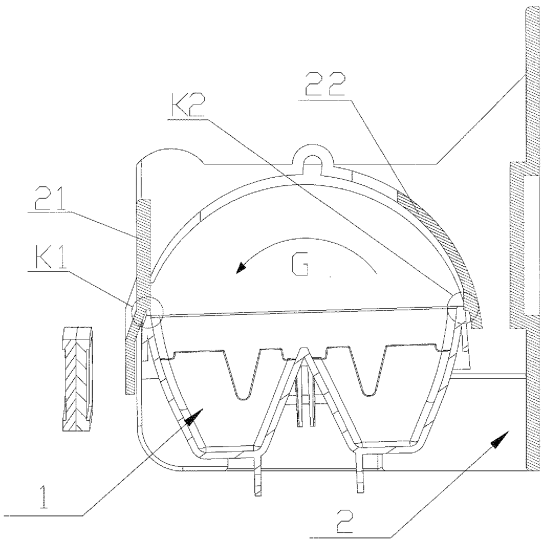

Fig.3

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Description

Field of the Invention

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

Background of the Invention

[0002] Following people's demands, the functions of a refrigerator get enriched gradually, among which the function of ice-making has increasingly become a factor that people consider when buying a refrigerator.

[0003] However, the existing refrigerators comprising the ice maker have a lot of drawbacks, one of which is: for the ice maker provided in a door body, when the door body is open or closed, water in the ice maker will spill out due to shaking, and flow into an ice storage box, so that the ice in the ice storage box will cake. Moreover, wherever the ice maker is located (in the door body or in the refrigerator), it still will cause the water having yet not being iced to spill over, when the ice maker moves during the process of making ice, which likewise will result in unfavorable phenomena such as ice caking in the ice storage box.

Summary of the Invention

[0004] The technical problem to be solved by the present invention lies in providing an ice maker which is capable of preventing water from spilling out.

[0005] In order to address the above technical problem, the present invention provides an ice maker, comprising a box body which stores water for making ice, a rotating mechanism which drives the box body to rotate, and a bracket for supporting the box body and the rotating mechanism, and also comprising baffles located at an upper port of the box body.

[0006] In the above, the baffle is connected with the bracket, and a lower portion of the baffle is matched with an upper port edge of the box body.

[0007] In the above, the upper port edge of the box body is an edge parallel with the generator when the box body is rotated.

[0008] Preferably, two baffles are provided successively in a rotation direction of the box body.

[0009] Preferably, an arc-shaped baffle and a flat-shaped baffle are provided successively in the rotation direction of the box body.

[0010] Lower portions of the arc-shaped baffle and the flat-shaped baffle are matched with two upper port edges of the box body respectively.

[0011] In the above, the baffle has at least one end portion connected with the bracket and an end portion which contacts the upper port edge of the box body and is open.

[0012] And, an inner wall of the open end portion is matched with the upper port edge of the box body.

[0013] In the above, the baffle is in a deformed state when the box body is in an ice-making position.

[0014] On the other hand, in order to address the above technical problem, the present invention also provides a refrigerator, comprising an ice-making chamber provided with an ice maker therein, the ice maker comprising a box body which stores water for making ice, a rotating mechanism which drives the box body to rotate, and a bracket for supporting the box body and the rotating mechanism, and further comprising a baffles located at an upper port of the box body.

[0015] In the above, the baffle is connected with the bracket, and the lower portion thereof is marched with an upper port edge of the box body.

[0016] Preferably, the upper port edge of the box body is an edge parallel with the generator when the box body is rotated.

[0017] And, an arc-shaped baffle and a flat-shaped baffle are provided successively in a the rotation direction of the box body.

[0018] Lower portions of the arc-shaped baffle and the flat-shaped baffle are matched with two upper port edges of the box body respectively.

[0019] Preferably, the baffle has at least one end portion connected with the bracket and an end portion which contacts the upper port edge of the box body and is open.

[0020] And, an inner wall of the open end portion is matched with the upper port edge of the box body.

[0021] In the present invention, as a baffle is provided at the upper port of the box body of the ice maker, when water spills out due to shaking, it can be blocked and prevented by the baffle from spilling into the ice storage box, etc. Moreover, as the contacting surface of the end of the baffle contacting with the upper port edge of the box body is the bottom surface of the contacting region, and the bottom surface also contacts with the top surface of the box body edge, the water spilling onto the baffle can be guided back into the box body, thereby assuring the required quantity of the ice-making water while preventing the water from flowing into the other portions.

Brief Description of the Drawings

[0022]

Figure 1 is a top view of an ice maker according to one embodiment of the present invention;

Figure 2 is an AA-direction sectional view of the embodiment as shown in Figure 1 ;

Figure 3 is a BB-direction sectional view of the embodiment as shown in Figure 1; and

Figure 4 is an exploded view of the embodiment as shown in Figure 1.

Detailed Description of Embodiments

[0023] Hereinafter, the present invention will be illustrated in detail with reference to the drawings.

[0024] The principle of the present invention will be firstly illustrated in brief. In the present invention, through providing the baffle at the upper port of the box body of the ice maker, the water in the box body is blocked from spilling out, thus functioning as preventing water from flowing over.

[0025] With reference to Figure 1 along with Figure 2 and Figure 3, they jointly show the structure of an embodiment of an ice maker of the present invention. As shown in the figures, a box body 1, a bracket 2, a rotating mechanism 3 and baffles 21 and 22 are comprised.

[0026] In the above, the bracket 2 supports the box body 1 and the rotating mechanism 3, both ends of the box body 1 and the bracket are rotatably connected; and the box body 1 can rotate in the bracket 2, when driven by the rotating mechanism bracket.

[0027] The baffle 21 and baffle 22 are provided on the bracket 2 to prevent water from spilling out. Specifically, both ends of the baffle 21 and baffle 22 are connected with the bracket 2.

[0028] As shown in Figure 3, the counter clockwise direction of rotation of the box body 1 (shown by mark G in the figure) can be seen therefrom. The edges parallel with the generator in its rotation direction are the two parallel long edges of the box body 1.

[0029] In the above, the baffle 21 is a flat-shaped baffle, with the inner wall of its lower portion contacting the edge of the long edge of the box body 1 while the upper portion extending towards above the upper port plane of the box body 1. The contacting part where the baffle 21 contacts the long edge is called as a contacting region (as shown by mark K1 in Figure 3). The bottom surface of the contacting region contacts the top surface of the long edge. The bottom surface of the contacting region contacts the top surface of the long edge such that the water drops spilling onto the inner surface of the baffle 21 flow back into the box body 1.

[0030] The baffle 22 is an arc-shaped baffle, and likewise the inner wall of the lower portion thereof also contacts the other long edge of the box body 1, while an upper portion extends towards above the upper port plane of the box body 1.

[0031] It should be noted that the lower portion of the baffle 22 and the other long edge of the box body 1 are clamped with each other (as shown by mark K2 in Figure 3, wherein K2 is shown in the mode of the intercrossing of the two in order to represent the pressing action). That is, when the box body 1 is rotated to the position as shown in the figure, a pressing effect is produced between the box body 1 and the lower portion of the baffle 22 by deformation of the baffle 22. Such pressing deformation results in closer contact between the box body 1 and the baffle 22, so that the water drops spilling onto the baffle 22 can flow back into the box body 1 much better.

[0032] In order to produce the above deformation, the initial position of the baffle 22 protrudes towards the box body 1 with respect to the position of the box body 1. Thus, when the box body 1 is rotated to the position shown in the figure, a pressing (deformation of the baffle 22) is produced between the box body 1 and the baffle 2 so as to realize better sealing.

[0033] It should be noted that both ends of the baffle 22 are connected with both ends of the bracket 2 (with reference to Figure 4 and Figure 3), such that the lower portion (lower end portion) of the baffle 22 is in a suspension and opening state which facilitates deformation thereof, so as to enable the box body 1 to easily overcome hindrance of the baffle 22 when it is rotated.

[0034] In addition, in another embodiment of the present invention, the upper portion of the baffle 22 is connected with the bracket 2, while the lower portion thereof is in a suspension and opening state, such that the effect of facilitating the above deformation also can be achieved so as to enable the box body 1 to easily overcome hindrance of the baffle 22 when it is rotated.

[0035] Both ends of the baffle 21 are likewise connected with both ends of the bracket 2 as shown in Figure 3 and Figure 4.

[0036] In a preferable embodiment of the present invention, soft material is laid on the part where the inner wall of the lower portion of the baffle 22 contacts the long edge of the box body 1, so as to achieve a closer contact when the baffler 22 and the box body 1 are pressed with each other and to better prevent overflow of water.

[0037] Likewise, the soft material is also laid on the part of the baffle 21 contacting corresponding long edge of the box body 1, for achieving better sealing function to prevent overflow of water.

[0038] In another embodiment of the present invention, the contacting structural relation between the baffle 22 and the box body 1 can also be applied to the contacting structural relation between the baffle 21 and the box body 1.

[0039] With reference to Figure 4, it shows an exploded view of the embodiment as shown in Figure 1. As shown in the figure 4, it can be seen clearly that three portions are comprised: the box body 1, the bracket 2 and the rotating mechanism 3.

[0040] In the above, the bracket 2 supports both ends of the box body 1 to enable the box body 1 to be rotated when driven by a motor in the rotating mechanism 3.

[0041] Specifically, one end of the box body 1 is provided with a protruding rotating shaft 11 which is matched with a supporting groove/hole (not shown in the figure) in one end within the bracket 2 to rotate, which also can be confirmed by Figure 2. From the right side of the embodiment shown in Figure 2, a structure of the rotating shaft 11 being inserted into the supporting groove/hole can be seen.

[0042] The other end of the box body 1 is provided with a driving hole 12 which is connected with the motor in the rotating mechanism 3 and rotates the box body 1

around the supporting groove/hole when driven by the motor.

[0043] Both baffle 21 and baffle 22 are provided in the bracket 2 into which the box body 1 is installed when in use.

[0044] In a preferable embodiment of the present invention, an arc surface of the arc-shaped baffle 22 is marched with the rotating arc surface of the box body 1. That is, the two are parallel to each other or the radian of the arc-shaped baffle 22 is larger than the rotating radian of the box body 1.

[0045] In another embodiment of the ice maker of the present invention, the baffle over the plane of the upper port of the box body 1 bridges two long edges of the box body 1, i.e. forming an arc-shaped baffle. The part where the arc-shaped baffle contacts the two long edges of the box body 1 is called as a contacting region, and likewise, the bottom surface of the contacting region contacts the top surfaces of the two long edges such that the water drops spilling onto the inner surface of the baffle flow back into the box body 1.

[0046] In still another embodiment of the ice maker of the present invention, regarding the embodiment as shown in Figure 1, the baffle 21 is replaced with a structure symmetrical with the baffle 22. That is, in the present embodiment, two arc-shaped baffles symmetrical with each other are formed over the plane of the upper port of the box body 1. Or it is also possible to replace the baffle 22 with a flat-shaped baffle likewise, wherein the lower portion of the flat-shaped baffle is inclined towards the box body so that the box body can also press the flat-shaped baffle when the box body is in the ice-making position. The pressing is produced by the deformation of the flat-shaped baffle.

[0047] It should be indicated that further illustrations will not be given herein as both the bracket and the rotating mechanism are common technologies in the art.

[0048] In an embodiment of a refrigerator of the present invention, it comprises a freezing chamber and a refrigerating chamber, wherein an inner side of a door body of the refrigerating chamber is provided with an ice-making chamber, and an ice maker is provided within the ice-making chamber. The above description can be referred to for learning embodiments of the structure of the ice maker.

[0049] In another embodiment of a refrigerator of the present invention, it comprises a freezing chamber and a refrigerating chamber, wherein the freezing chamber or refrigerating chamber is provided with an ice-making chamber, while the ice-making chamber is provided with an ice maker therein. For learning the structure of the ice maker, the description to respective embodiments above can be referred to.

[0050] The presence of baffles of the present invention prevents water spilling out during shaking of the ice maker from flowing into the ice storage box and causing ice caking, and at the same time induces the water spilling out to flow back into the ice maker, such that the ice-making quantity reaches the designed requirement to a certain extent.

[0051] Above disclosure is only a preferable embodiment of the present invention but, of course, not to limit the scope of claims of the present invention. Therefore, equivalent alterations according to the claims of the present invention are still covered by the scope of the present invention.

Claims

1. An ice maker, comprising a box body which stores water for making ice, a rotating mechanism which drives the box body to rotate, and a bracket for supporting the box body and the rotating mechanism, **characterized by** further comprising baffles located at an upper port of the box body.

2. The ice maker according to claim 1, wherein the baffles are connected with the bracket, and a lower portion of the baffle is marched with an upper port edge of the box body.

3. The ice maker according to claim 2, wherein the upper port edge of the box body is an edge parallel with the generator when the box body is rotated.

4. The ice maker according to claim 3, wherein two baffles are provided successively in a rotation direction of the box body.

5. The ice maker according to claim 4, wherein an arc-shaped baffle and a flat-shaped baffle are provided successively in the rotation direction of the box body; and
lower portions of the arc-shaped baffle and the flat-shaped baffle are matched with two upper port edges of the box body respectively.

6. The ice maker according to any one of claims 2-5, wherein the baffle has at least one end portion connected with the bracket and an end portion which contacts the upper port edge of the box body and is open; and
an inner wall of the open end portion is matched with the upper port edge of the box body.

7. The ice maker according to claim 6, wherein the baffle is in a deformation state when the box body is in an ice-making position.

8. A refrigerator, comprising an ice-making chamber provided with an ice maker therein, the ice maker comprising a box body which stores water for making ice, a rotating mechanism which drives the box body to rotate, and a bracket for supporting the box body and the rotating mechanism, **characterized by** fur-

ther comprising baffles located at an upper port of the box body.

9. The refrigerator according to claim 8, wherein the baffles are connected with the bracket, and lower portion of the baffle is marched with an upper port edge of the box body.

10. The refrigerator according to claim 9, wherein the upper port edge of the box body is an edge parallel with the generator when the box body is rotated; and an arc-shaped baffle and a flat-shaped baffle are provided successively in the rotation direction of the box body;
lower portions of the arc-shaped baffle and the flat-shaped baffle are marched with two upper port edges of the box body respectively.

11. The refrigerator according to any one of claims 8, 9, 10, wherein the baffle has at least one end portion connected with the bracket and an end portion which contacts the upper port edge of the box body and is open; and
an inner wall of the open end portion is marched with the upper port edge of the box body.

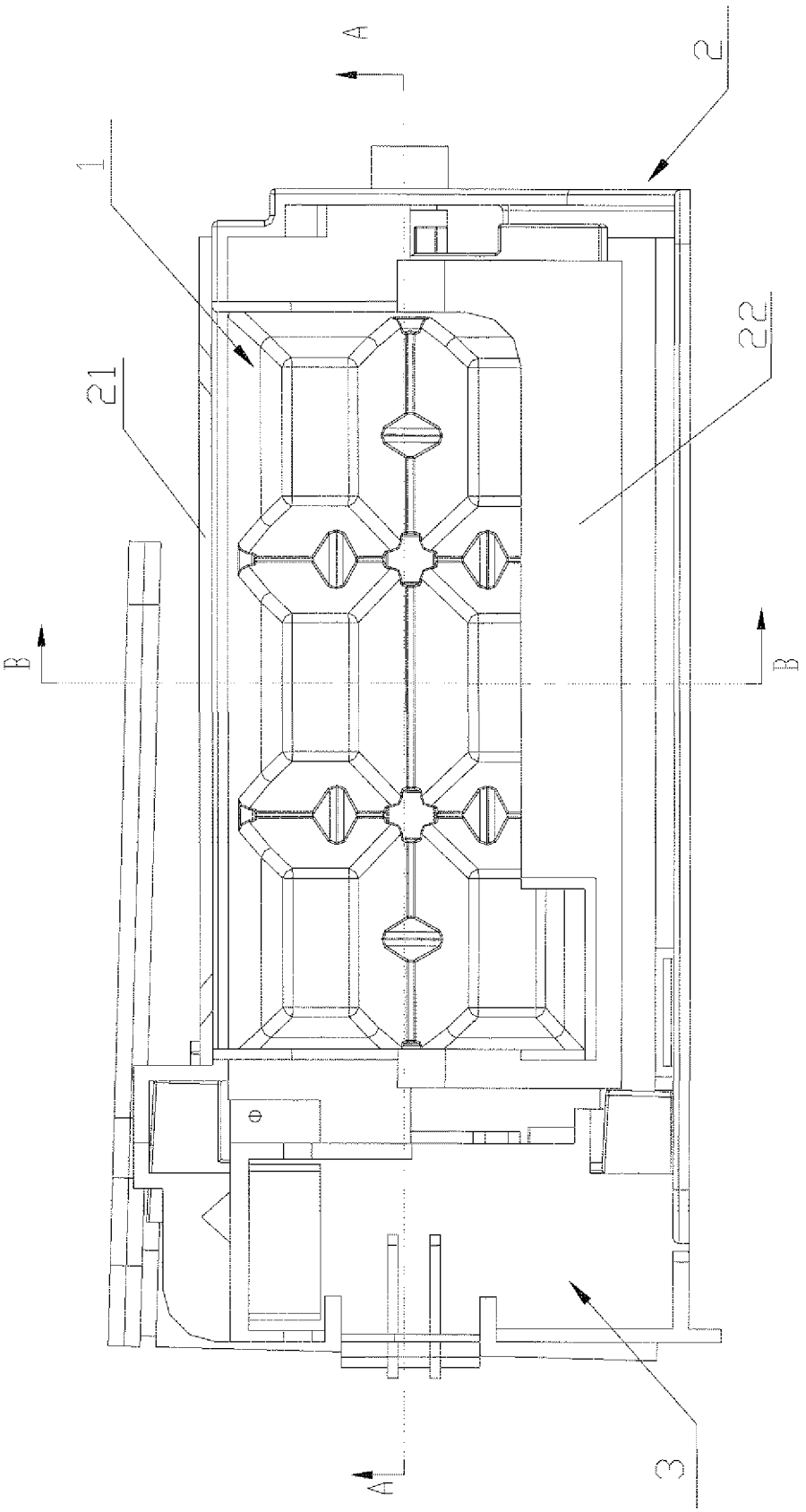

Fig.1

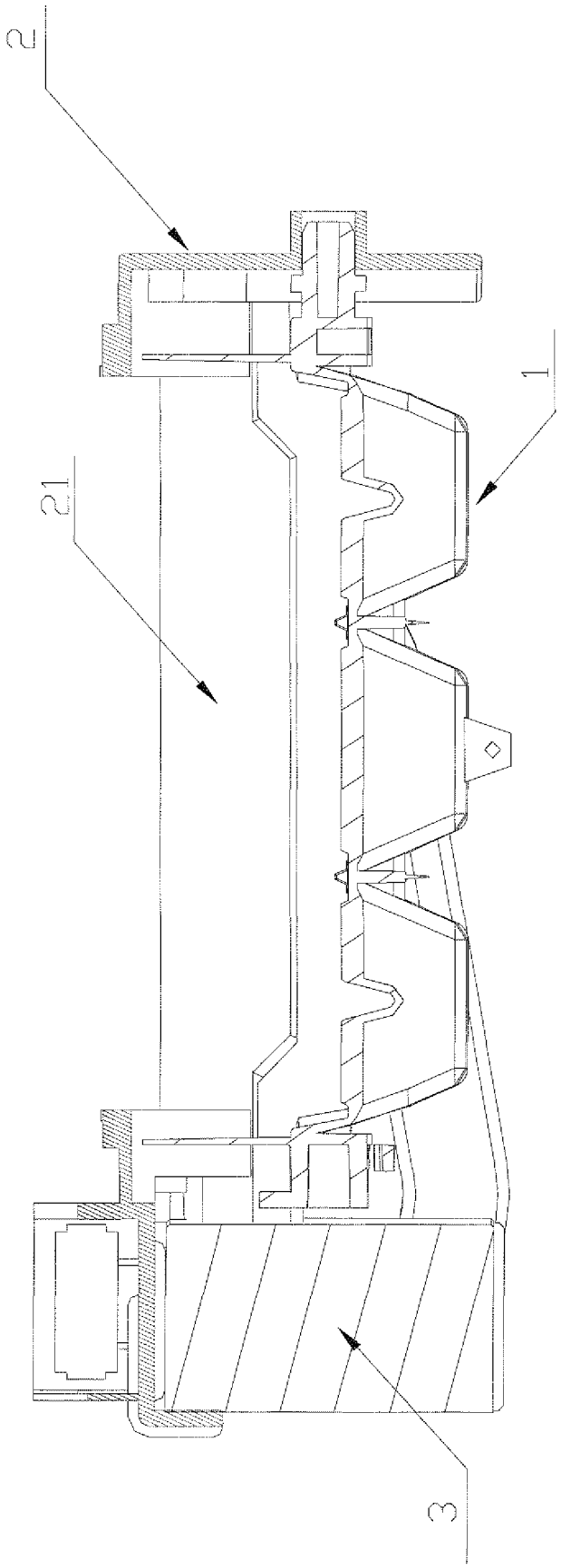

Fig.2

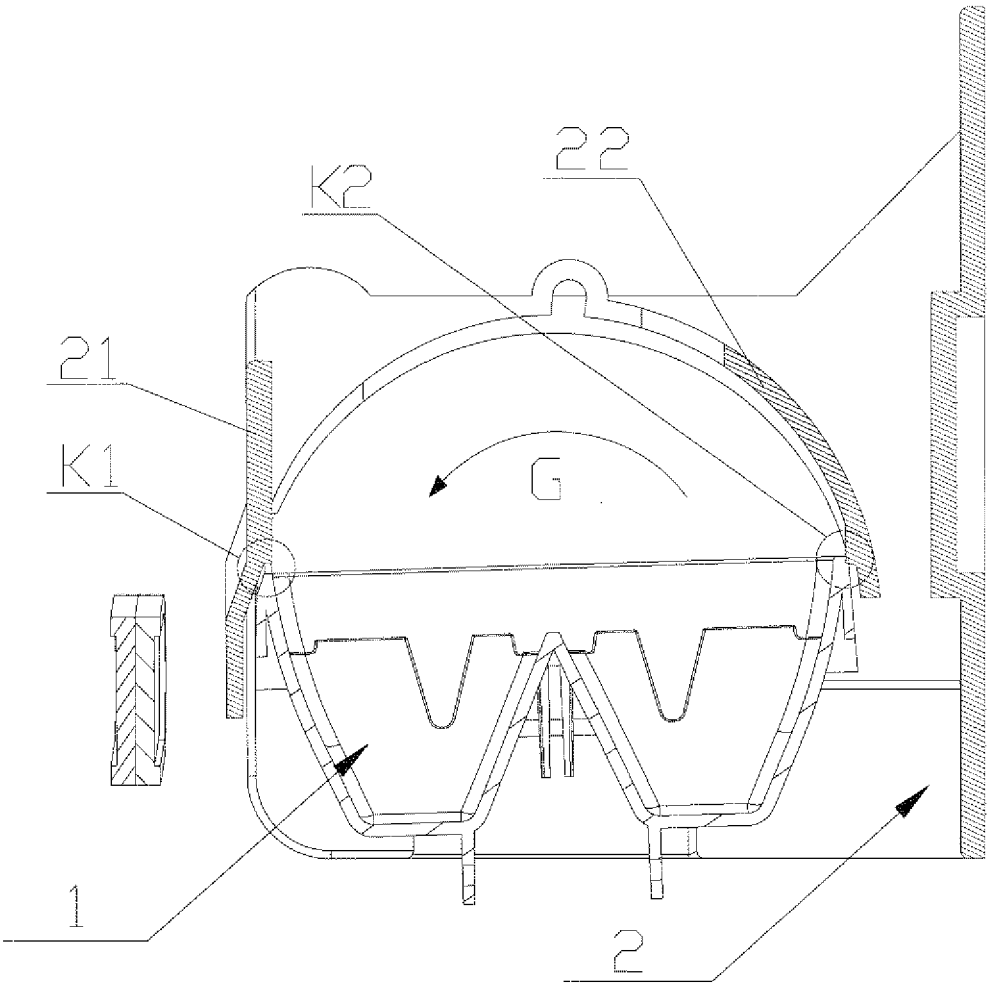

Fig.3

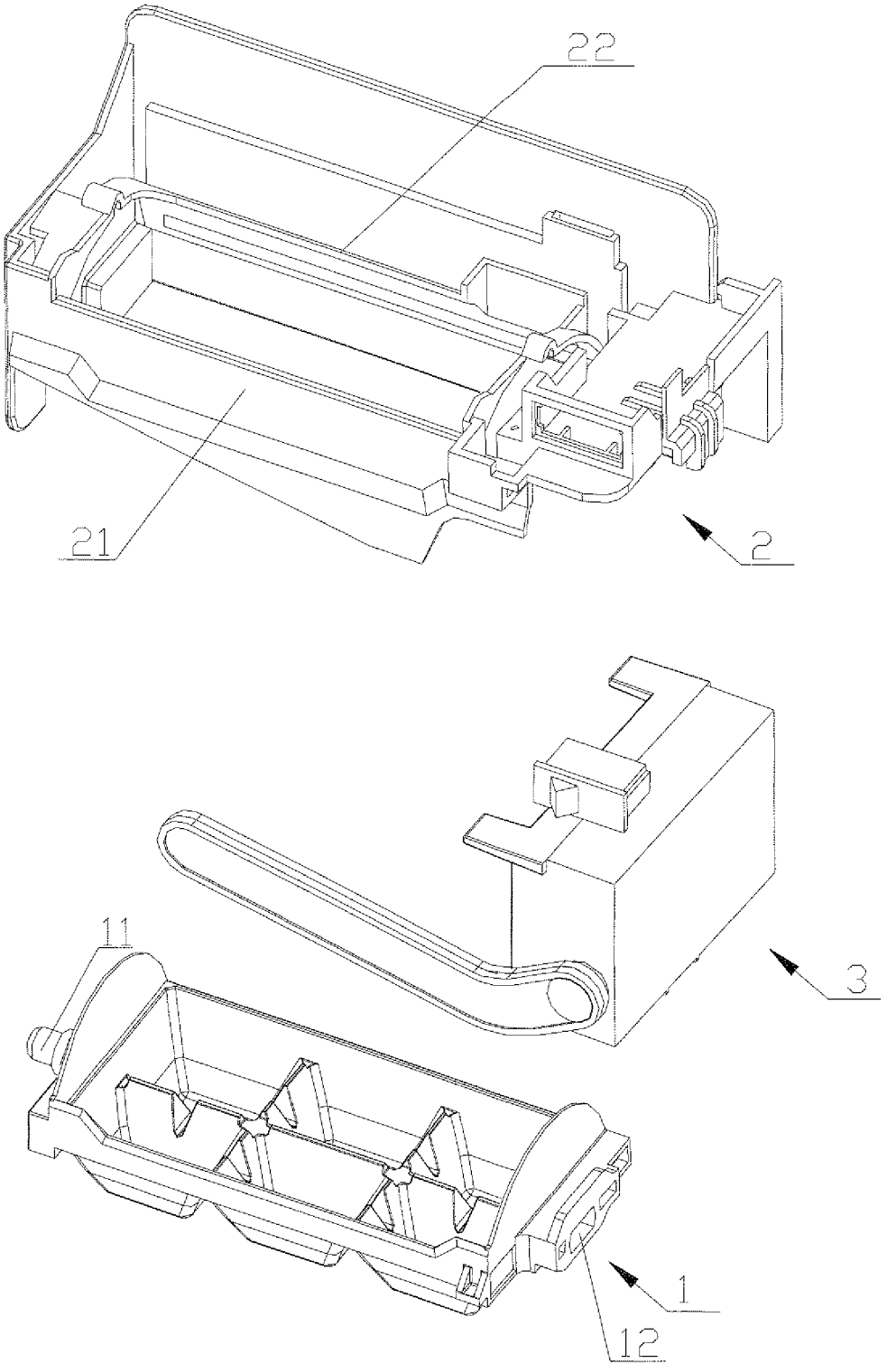

Fig.4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2009/072481

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: F25C 1; F25D 11; 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)

WPI, EPODOC, PAJ, CPRS, CNKI: icemaker, overflow, flood, spill, baffle, guide, shield, plate

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO2008056918A1(LG ELECTRONICS INC.) 15 May 2008(15.05.2008) Description, page 9, line 18 to page 15, line 11, figures 4-9)	1-11
X	WO2008023911A1(LG ELECTRONICS INC.) 28 Feb. 2008(28.02.2008) Description, paragraphs 22-49, figures 1-5	1-11
X	JP05-296623A(HITACHI LTD.) 09 Nov. 1993(09.11.1993) Description, paragraphs 22-52, figures 4-14	1-4,8
PX	CN101315240A(HAIER GROUP et al.) 03 Dec. 2008(03.12.2008) claims 1-11	1-11
X	JP06-011228A(HITACHI LTD.) 21 Jan. 1994(21.01.1994) Description, paragraphs 23-32, figures 10-12	1,8

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 July 2009(23.07.2009)	**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

International application No.
PCT/CN2009/072481

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
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JP5-296623A	09.11.1993	NONE	

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INTERNATIONAL SEARCH REPORT

International application No.
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CLASSIFICATION OF SUBJECT MATTER

F25C 1/24 (2006.01) i

F25D 11/00 (2006.01) i