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(54) **ICE MAKER AND REFRIGERATOR HAVING SAME**

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(57) **ABSTRACT**

An ice maker and a refrigerator having the same are disclosed. A refrigerator may include a main body having a storage room therein; a compressor at one side of the main body, configured to compress refrigerant; a door on the main body, configured to open and close the storage room; and an ice maker in the storage room, wherein the ice maker may include a case having an external shape; an ice tray configured to contain water; a guide unit under the ice tray, forming a path for flowing cold air; an ice bucket under the guide unit and comprising a container having a concave center portion; an ice making fan inside the case configured to generate or facilitate a flow of air; and a rotation unit configured to move the ice in the ice tray to the ice bucket.

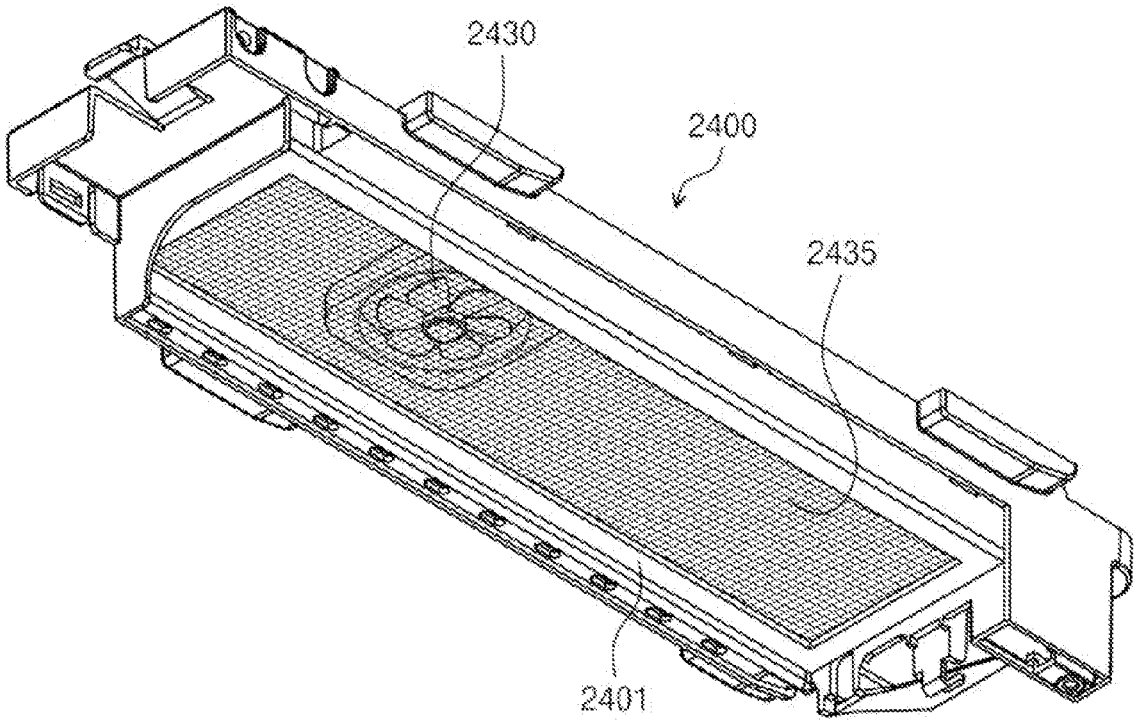


FIG. 1

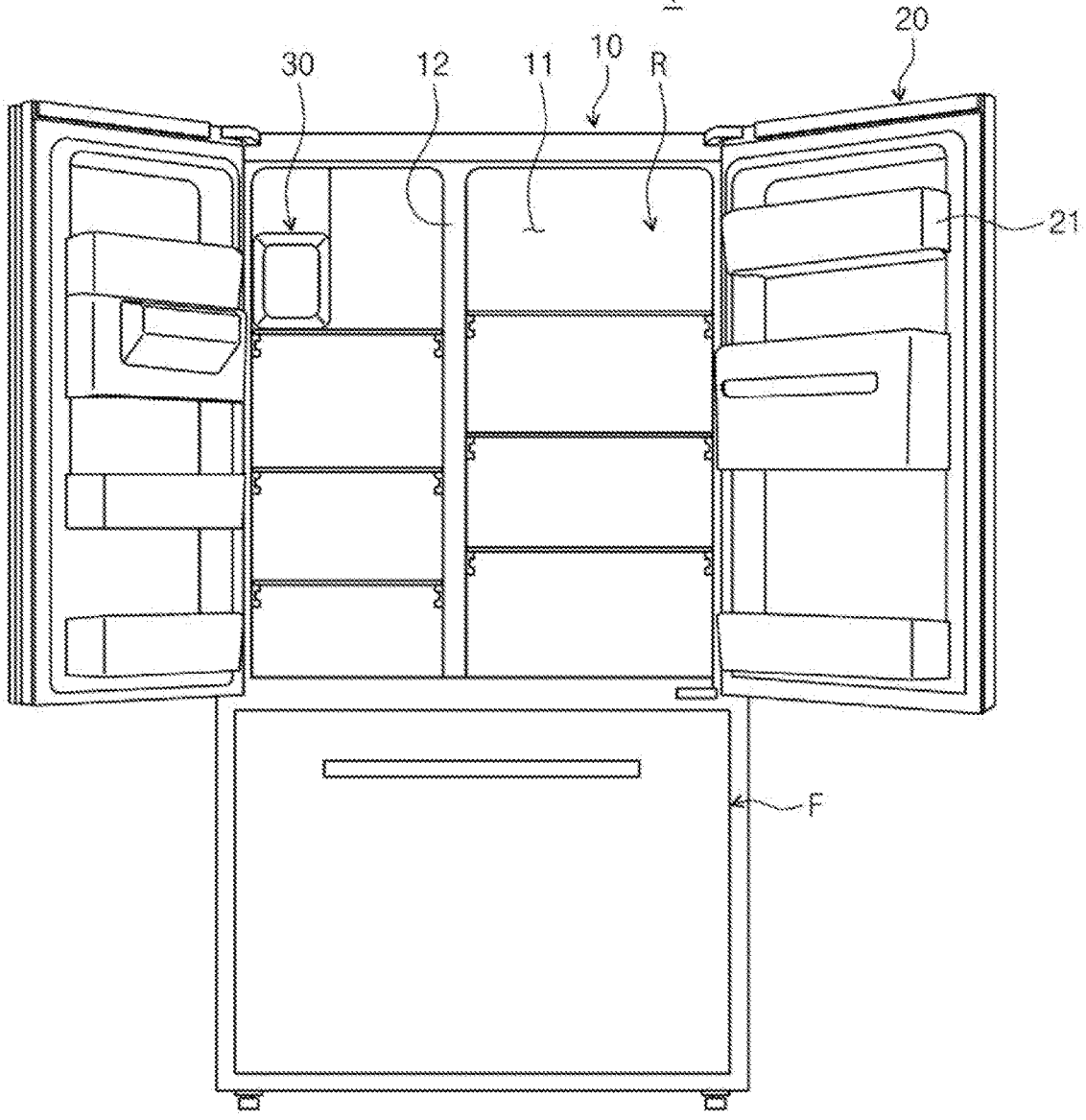


FIG. 2

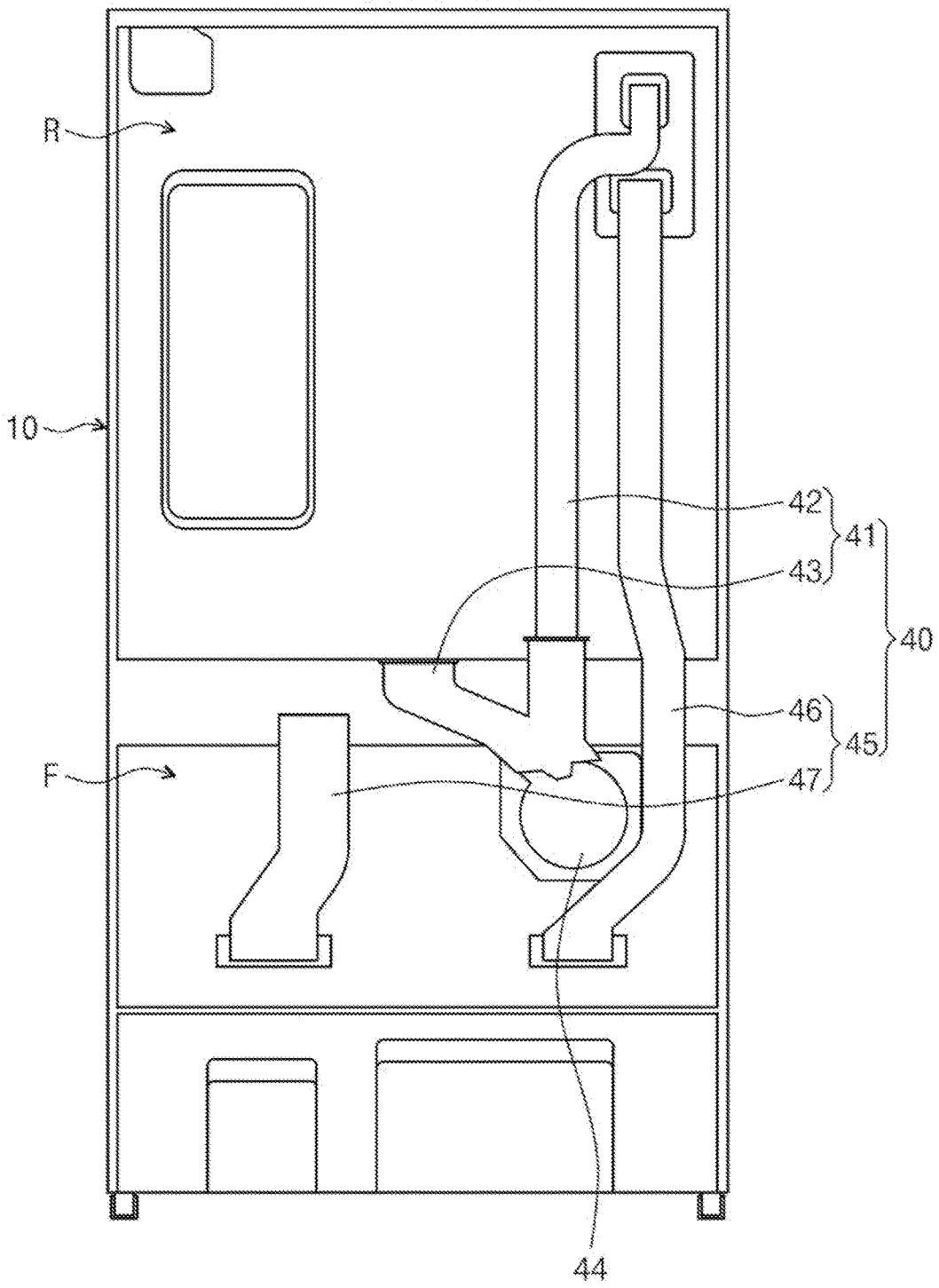


FIG. 3

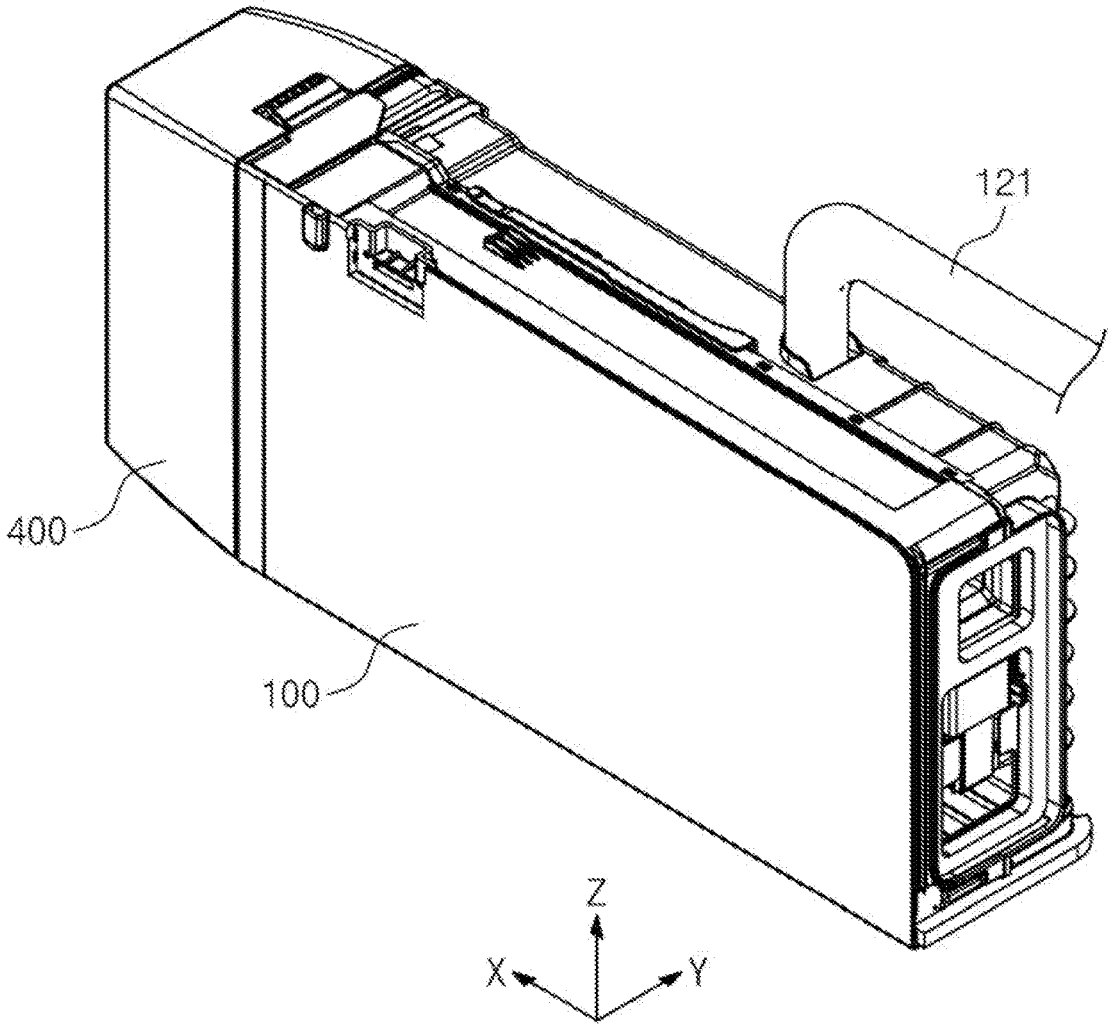


FIG. 4

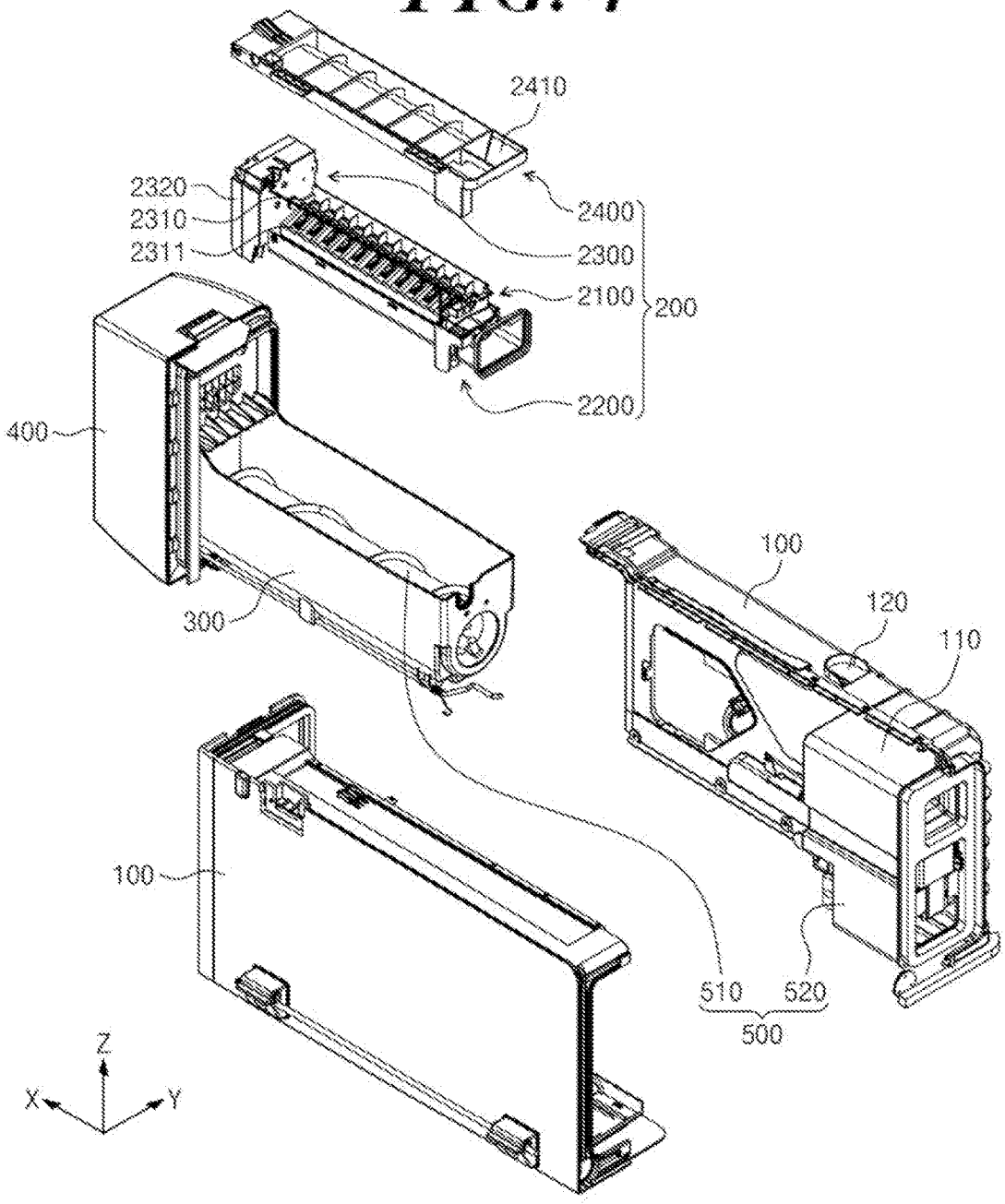

2410
2320
2310
2311
2400
2300
2100
200
2200
400
300
100
120
110
100
510
520
500
Z
X
Y

FIG. 5

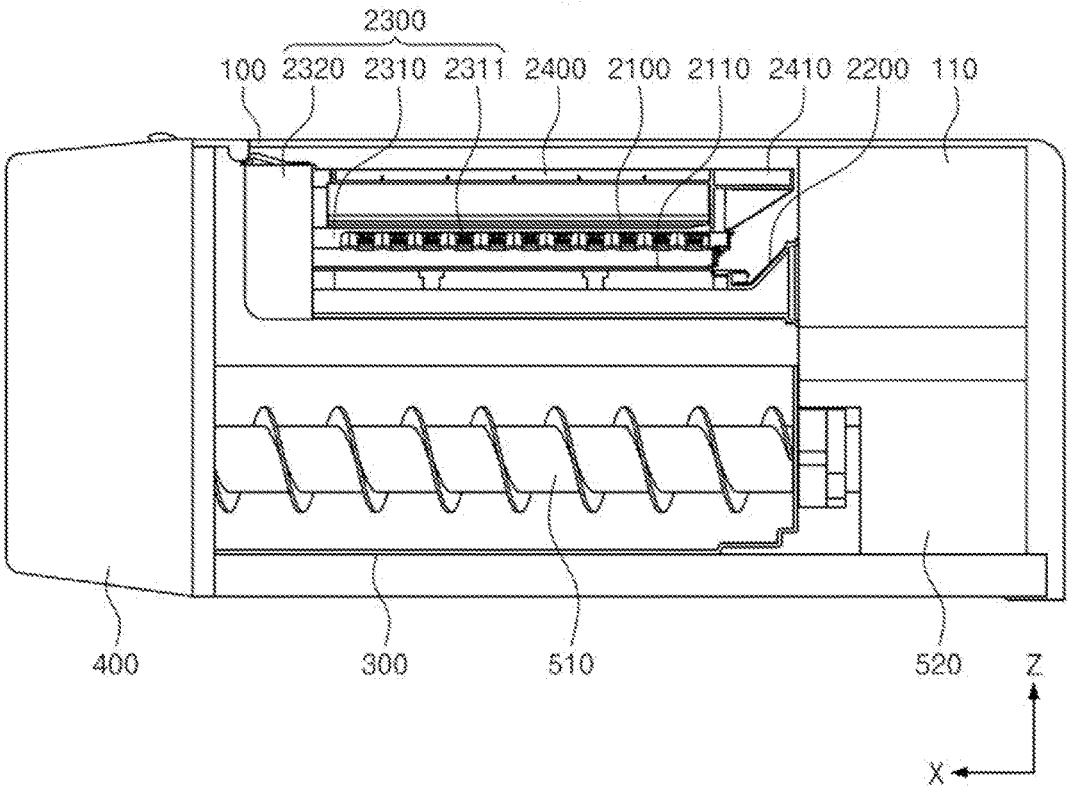

2300
100
2320
2310
2311
2400
2100
2110
2410
2200
110
400
300
510
520
Z
X

FIG. 6

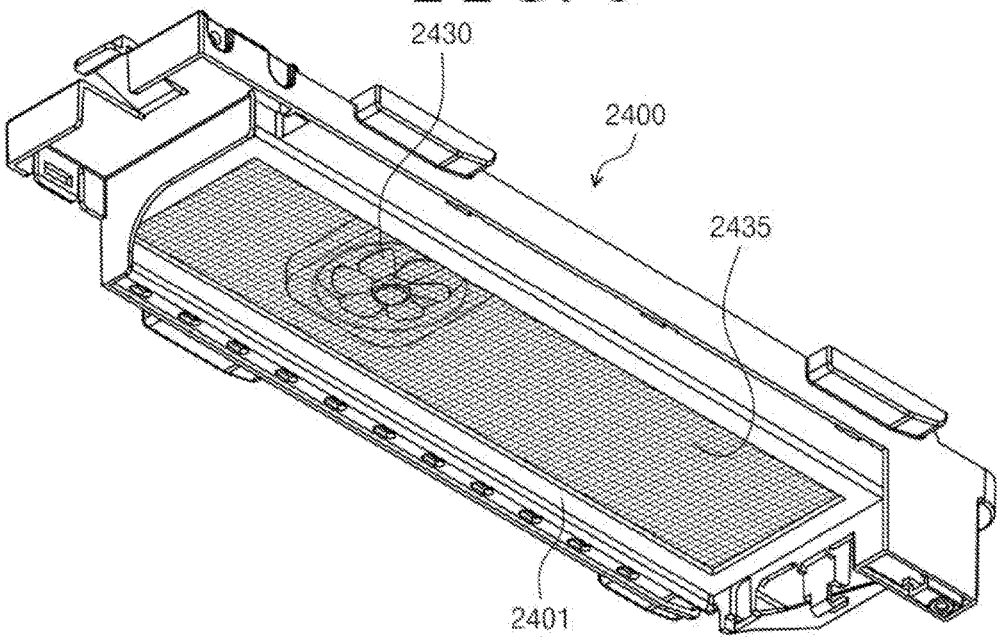
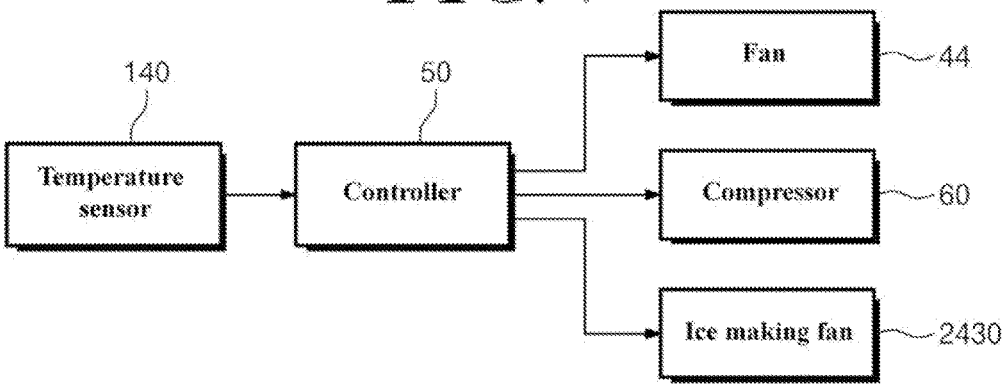

2430
2400
2435
2401

FIG. 7


140
50
Temperature sensor
Controller
Fan
44
Compressor
60
Ice making fan
2430

ICE MAKER AND REFRIGERATOR HAVING SAME

TECHNICAL FIELD

[0001] The present invention relates to an ice maker and a refrigerator having the same.

BACKGROUND

[0002] A refrigerator is an apparatus for storing food at a low temperature. The refrigerator can be configured to store the food in a frozen or refrigerated state according to the type of food to be stored. The inside of the refrigerator is cooled down by continuously supplied cold air, and the cold air is continuously generated by the heat exchange action of a refrigerant by way of a refrigeration cycle going through the process of compression, condensation, expansion and evaporation. Since the cold air supplied to the inside of the refrigerator is evenly delivered inside the refrigerator owing to convection, the food inside the refrigerator can be stored at a desired temperature.

[0003] An ice maker may be provided in the refrigerator for the convenience of use. The ice maker may make ice by supplying cold air to water and storing a predetermined amount of ice. The ice maker may include an ice making tray for making ice, and an ice storage unit for storing the ice made by the ice making tray.

SUMMARY

[0004] An object of the present invention is to provide an ice maker which can effectively make ice, and a refrigerator having the same.

[0005] Another object of the present invention is to provide an ice maker which can reduce the time for freezing water, and a refrigerator having the same.

[0006] In accordance with an aspect of the present invention, there is provided a refrigerator comprising a main body having a storage room therein; a compressor at one side of the main body, configured to compress refrigerant; a door on the main body, configured to open and close the storage room; and an ice maker in the storage room, wherein the ice maker includes a case having an external shape; an ice tray configured to contain water; a guide unit under the ice tray, forming a path for flowing cold air; an ice bucket under the guide unit and comprising a container having a concave center portion; an ice making fan in the case, configured to generate or facilitate air flow; and a rotation unit configured to move the ice in the ice tray to the ice bucket.

[0007] The ice maker may further include a cover unit on or above the ice tray, and the ice making fan may be in or within the cover unit.

[0008] The ice maker may further include a distribution panel having a preset area, between the ice making fan and the ice tray, and having a plurality of holes.

[0009] The ice making fan may be on or in (e.g., on an inside surface of) the case.

[0010] For example, the ice making fan may be on an outside surface of the ice bucket.

[0011] Alternatively, the ice making fan may be in the guide unit.

[0012] The refrigerator may further comprise a controller configured to control (e.g., operate) the ice making fan when the compressor is stopped (e.g., not compressing the refrigerant).

[0013] In accordance with another aspect of the present invention, there is provided an ice maker comprising a case having an external shape; an ice tray configured to contain water; a guide unit under the ice tray, forming a path for flowing cold air; an ice bucket under the guide unit and comprising a container having a concave center portion; a cover unit on or above the ice tray; an ice making fan in the cover unit; and a rotation unit configured to move the ice in the ice tray to the ice bucket.

[0014] The ice maker may further comprise a distribution panel having a preset area, between the ice making fan and the ice tray, and having a plurality of holes.

[0015] According to an embodiment of the present invention, an ice maker which can effectively make ice and a refrigerator having the same can be provided.

[0016] In addition, an ice maker which can reduce the time for freezing water and a refrigerator having the same can be provided.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] FIG. **1** is a perspective view showing an exemplary refrigerator according to one or more embodiments of the present invention;

[0018] FIG. **2** is a rear elevation view showing an exemplary duct in the refrigerator of FIG. **1**;

[0019] FIG. **3** is a perspective view showing an exemplary ice maker suitable for the refrigerator of FIG. **1**;

[0020] FIG. **4** is an exploded perspective view showing the ice maker of FIG. **3**;

[0021] FIG. **5** is a side cross-sectional view of the ice maker of FIG. **3**;

[0022] FIG. **6** is a perspective view showing an exemplary cover unit viewed from the bottom; and

[0023] FIG. **7** is a block diagram showing control relationships in the refrigerator of FIG. **1**.

DETAILED DESCRIPTION

[0024] Hereinafter, embodiments of the present invention will be described in more detail with reference to the accompanying drawings. The disclosed embodiments may be modified in a variety of forms, and the scope of the present invention should not be limited to the embodiments described below. The embodiments are provided to explain the present invention to those skilled in the art. Accordingly, the shapes of the elements in the drawing may be exaggerated to emphasize more clear descriptions.

[0025] FIG. **1** is a perspective view showing a refrigerator according to one or more embodiments of the present invention.

[0026] Referring to FIG. **1**, a refrigerator **1** according to one or more embodiments of the present invention may include a main body **10** and one or more doors **20**.

[0027] Hereinafter, the direction from the rear side to the front side of the refrigerator **1** is referred to as a thickness direction, the direction from one side surface to another side surface of the refrigerator **1** is referred to as a width direction, and the direction from the bottom surface to the top surface of the refrigerator **1** is referred to as a height direction. The door(s) **20** are at the front of the refrigerator **1**, and the icemaker **30** is adjacent to the top surface of the refrigerator **1**.

[0028] The main body **10** provides and/or defines the overall external shape of the refrigerator **1**. At least one

storage room **11** may be inside the main body **10**. The storage room(s) **11** inside the main body **10** may be partitioned by a barrier **12**. The storage room(s) **11** may include a refrigeration room R and a freezer room F. For example, the refrigeration room R may be at or in the upper part of the main body **10**, and the freezer room F may be at or in the lower part of the main body **10**.

[0029] At least one door **20** is on the main body **10**. The door **20** opens and closes the storage room **11**. For example, the door **20** is hingedly or pivotally fixed to the main body **10** to rotate, and may open and close the storage room **11** as it rotates with respect to the main body **10**. The number of doors **20** may correspond to the number of partitions of the storage room **11**. For example, doors **20** are provided in front of the refrigeration room(s) R and the freezer room(s) F, respectively, and may individually open and close a corresponding one of the refrigeration room(s) R and the freezer room(s) F. For example, two doors **20** may be provided in the refrigeration room R on the left and right sides. One or more shelves **21** may be provided on the inside surface of the door **20**.

[0030] An ice maker **30** may be at or on one side of one storage room **11**. For example, the ice maker **30** may be in one refrigeration room R and/or at the upper part of one of the storage rooms **11**. Alternatively, the ice maker **30** may be in one door **20** or in the freezer room F.

[0031] FIG. **2** is a rear elevation view showing an exemplary duct in the refrigerator **1** of FIG. **1**.

[0032] Referring to FIG. **2**, a duct **40** that provides a path for flowing air may be provided in the refrigerator **1**.

[0033] The duct **40** may include a cold air duct **41** and a collection duct **45**.

[0034] The cold air duct **41** provides a path for supplying cold air generated in the space around the evaporator (not shown) to other areas of the refrigerator **1**. The evaporator may be located in or behind the freezer room F, and an end of the cold air duct **45** may be connected to the freezer room F. For example, the evaporator may be adjacent to the rear side of the freezer room F, and an end (hereinafter, a supply terminal) of the cold air duct **45** may be connected to the rear side and/or pass through the rear wall of the freezer room F.

[0035] The cold air duct **41** may include a first cold air duct **42** and a second cold air duct **43**.

[0036] The first cold air duct **42** and the second cold air duct **43** may be branched at the supply terminal (e.g., at or near the fan **44**) or at a point spaced apart from the supply terminal by a preset distance. The first cold air duct **42** is connected to the ice maker **30** and may supply cold air from the supply terminal to the ice maker **30**. The second cold air duct **43** is connected to the refrigeration room R and may supply cold air from the supply terminal to the refrigeration room R. A fan **44** may be at a point or location in the cold air duct **41**. The fan **44** may provide pressure for flowing the cold air through the cold air ducts **42** and **43** from the supply terminal. For example, the fan **44** may be at the supply terminal (e.g., adjacent to the evaporator).

[0037] The collection duct **45** provides a path for collecting air (e.g., cold air) from other areas of the refrigerator **1** to the evaporator or the vicinity of the evaporator. The collection duct **45** may include a first collection duct **46** and a second collection duct **47**. First and second ends of the first collection duct **46** may be connected to the ice maker **30** and the freezer room F, respectively. The first collection duct **46** provides a path for returning the air from the ice maker **30** that was used for making ice. First and second ends of the second collection duct **47** may be connected to the refrigeration room R and the freezer room F, respectively. The second collection duct **47** returns the cold air in the refrigeration room R to the freezer room F or the evaporator behind the freezer room F in response to the cold air being supplied from the evaporator (or, alternatively, the freezer room F) to the refrigeration room R.

[0038] FIG. **3** is a perspective view showing an ice maker suitable for the refrigerator **1** of FIG. **1**, FIG. **4** is an exploded perspective view showing the ice maker of FIG. **3**, FIG. **5** is a side cross-sectional view of the ice maker of FIG. **3**, and FIG. **6** is a perspective view showing an exemplary cover unit viewed from the bottom.

[0039] Referring to FIGS. **3** to **6**, the ice maker **30** may include a case **100**, an ice making assembly **200**, an ice bucket **300**, a discharge unit **400** and a transfer unit **500**.

[0040] The ice maker **30** may make and store ice.

[0041] Hereinafter, the direction from a cold air duct **110** to the discharge unit **400** is referred to as a first direction X, a direction perpendicular to the first direction X (e.g., a horizontal direction and/or in a plane) is referred to as a second direction Y, and the vertical direction perpendicular to both the first direction X and the second direction Y is referred to as a third direction Z. In addition, a side on which the discharge unit **400** is located is referred to as a front side, and a side on which the cold air duct **110** is located is referred to as a rear side.

[0042] The external shape of the ice maker **30** may be defined in part by the case **100**. The case **100** may have a preset volume and a space for accommodating constitutional components of the ice maker **30** therein. The case **10** may be fixed at a point inside the storage room **11** or inside the door **20**.

[0043] The ice making assembly **200** may make ice by exchanging heat of or in the water with cold air (e.g., from the duct **42**). The ice making assembly **200** may include an ice tray **2100**, a guide unit **2200**, a rotation unit **2300** and a cover unit **2400**.

[0044] The ice tray **2100** is configured to contain water. The water in the ice tray **2100** is solidified (e.g., becomes ice) through heat exchange with cold air. The ice tray **2100** may comprise a container having a center portion that is concave downwards (e.g., U-shaped), and a space and/or preset volume for containing water may be on or in the ice tray **2100**. For example, the ice tray **2100** may comprise a multi-compartment container, each compartment being configured to hold a predetermined volume of liquid water and optionally having a convex lower surface, in which the center of each compartment has a greater depth than along the sidewalls of each compartment. The ice tray **2100** may have a preset length along the first direction X and a preset width in the second direction Y. For example, the ice tray **2100** may be rectangular as seen from the top (e.g., in a plan view).

[0045] A heater **2110** may be under the ice tray **2100**. The heater **2110** may contact the bottom surface of the ice tray **2100** at least at one point. When the ice made in the ice tray **2100** is transferred to the ice bucket **300** by the rotation unit **2300**, the heater **2110** may heat the bottom surface of the ice tray **2100** so that the ice may be effectively separated from the ice tray **2100**.

[0046] The guide unit **2200** may be under the ice tray **2100**. The guide unit **2200** forms a path for flowing cold air

onto and/or around the ice tray **2100**. The cold air flowing between the guide unit **2200** and the ice tray **2100** cools down the ice tray **2100** to freeze the water in the ice tray **2100**. The guide unit **2200** may have a preset length in the first direction X and a preset width in the second direction Y. The guide unit **2200** may contact the ice tray **2100** at least at a point and may support the ice tray **2100**. The rear end of the guide unit **2200** in the first direction X may communicate with the cold air duct **110** that supplies the cold air. The guide unit **2200** may be fixed to the inside surface of the case **100** or to the cold air duct **110**.

[0047] The rotation unit **2300** moves the ice in the ice tray **2100** to the ice bucket **300**. The rotation unit **2300** may include an ice removing shaft **2310** and a drive housing **2320**.

[0048] As the ice removing shaft **2310** rotates, the ice in the ice tray **2100** is moved to the outside of the ice tray **2100**. The ice removing shaft **2310** has a preset length and may be in a space above the ice tray **2100**. The length of the ice removing shaft **2310** may be in or along the first direction X. One or more ice removing prominences **2311** may be along the ice removing shaft **2310**. The ice removing prominence (s) **2311** may extend from the outer surface of the ice removing shaft **2310** by a preset length. The ice removing prominence(s) **2311** may not contact the water in the ice tray **2100** when the rotation unit **2300** is in a standby state (i.e., not in an operational state). When the ice removing shaft **2310** rotates for transfer of the ice, the ice removing prominence(s) **2311** may push the ice out of the ice tray **2100**.

[0049] A drive unit (e.g., motor) inside the drive housing **2320** provides power for rotating the ice removing shaft **2310**. The drive housing **2320** may be located at one side of the ice tray **2100** along or with respect to the first direction X. The drive housing **2320** may be located on the opposite side of the ice removing shaft **2310** from the cold air duct **110**. One end of the ice removing shaft **2310** may be inserted into the drive housing **2320** by a preset length and connected to the driving unit (e.g., motor) inside the drive housing **2320**.

[0050] The cover unit **2400** may be on or over the ice tray **2100**, in or along the third direction Z. The cover unit **2400** may cover all or part of the ice tray **2100**. The cover unit **2400** may have a preset length in the first direction X and a preset width in the second direction Y. The width of the cover unit **2400** may correspond to the width of the guide unit **2200** or may be larger than the width of the guide unit **2200** by a set width. Accordingly, the ice tray **2100** may be between the guide unit **2200** and the cover unit **2400**. The front end of the cover unit **2400** may contact the top of the drive housing **2320**. The cover unit **2400** may be fixed to the inner surface of the case **2410** at least at one point.

[0051] A water supply unit **2410** may be at the rear end of the cover unit **2400**. The water supply unit **2410** supplies water from an external source to the ice tray **2100**. For example, a water supply hole **120** connected to a water supply pipe **121** may be at one side of the case **100**. In addition, the water supply unit **2410** may be aligned with the water supply hole **120**, and the water flowing through the water supply hole **120** may be supplied to the water supply unit **2410**.

[0052] A side wall **2401** (FIG. **6**) may be at one or more sides (e.g., along the second direction Y) of the cover unit **2400**, and may extend from the distribution panel **2435** by (or may otherwise have) a preset length. The side wall **2401** of the cover unit **2400** may be adjacent to one side of the ice tray **2100** (e.g., in or along the second direction Y). In addition, another side of the cover unit **2400** (e.g., in or along the second direction Y) may be open. Accordingly, the ice of the ice tray **2100** may move to the ice bucket **300** through the open side of the cover unit **2400**.

[0053] An ice making fan **2430** may be in the cover unit **2400**. The ice making fan **2430** generates, causes or facilitates flow of air inside the case **100**. For example, the ice making fan **2430** may be on or in the top of the cover unit **2400** and may face downwards. Alternatively, the ice making fan **2430** may be on the side wall **2401** of the cover unit **2400**. The ice making fan **2430** may be in a hole or opening passing through the cover unit **2400**. In addition, the space in which the ice making fan **2430** is located may be blocked from areas external to the cover unit **2400** by the cover unit **2400**.

[0054] A distribution panel **2435** may be between the ice making fan **2430** and the ice tray **2100**. The distribution panel **2435** may have a preset area and may face the ice making fan **2430**. One end of the distribution panel **2435** may be fixed to the cover unit **2400** or the drive housing **2320**. The distribution panel **2435** may comprise a grate or otherwise have a plurality of holes for evenly supplying the air from the ice making fan **2430** to the ice tray **2100**. For example, the distribution panel **2435** may comprise a plurality of ribs in a lattice structure, a perforated plate, or the like.

[0055] The ice bucket **300** is located under the ice making assembly **200** and contains ice from the ice making assembly **200**. The ice bucket **300** may have a preset length along the first direction X and a preset width in the second direction Y. The ice bucket **300** may comprise a container having a center portion that is concave downwards (e.g., U-shaped), and the ice bucket **300** may include a preset volume for containing ice. As seen from the top along the third direction Z, at least part of the ice bucket **300** is positioned outside the ice tray **2100** in the width direction, and the ice supplied from the ice tray **2100** may be contained in the ice bucket **300**.

[0056] The discharge unit **400** may be at an end of the ice bucket **300**. The discharge unit **400** discharges the ice in the ice bucket **300** to the outside of the ice maker **30** (e.g., through the corresponding door **20**; see FIG. **1**). The discharge unit **400** may be coupled or connected to the front end of the ice bucket **300**. The discharge unit **400** may be outside the case **100**. The discharge unit **400** has a width corresponding to the case **100** in the second direction Y and a height corresponding to the case **100** in the third direction Z and may shield the case **100**. The discharge unit **400** may be detachable from the case **100**. Accordingly, if the user separates the discharge unit **400** from the case **100** and moves the discharge unit **400** forward (e.g., out of the corresponding storage space), the ice bucket **300** may be exposed to the outside of the case **100**.

[0057] The transfer unit **500** moves the ice in the ice bucket **300** to the discharge unit **400**. The transfer unit **500** includes a transfer shaft **510** and a transfer housing **520**.

[0058] As the transfer shaft **510** rotates, the ice in the ice bucket **300** moves to the discharge unit **400**. The transfer shaft **510** has a preset length and may be in the lower part or portion of the ice bucket **300**. The transfer shaft **510** may

have a length or rotational axis in or along the first direction X. For example, the transfer shaft **510** may be or comprise an auger.

[0059] The transfer housing **520** houses a motor that provides power for rotating the transfer shaft **510**. The transfer housing **520** may be at one side of the ice bucket **300** in or along the first direction X. The transfer housing **520** may be located on the opposite side of the ice bucket **300** from the discharge unit **400**. The transfer shaft **510** is coupled or connected to the transfer housing **520** or the motor therein, and may rotate by the power provided by the motor in the transfer housing **520**.

[0060] FIG. **7** is a block diagram showing control relationships in the refrigerator **1** of FIG. **1**. Referring to FIG. **7**, the refrigerator **1** may include a controller **50**. The controller **50** controls constitutional components of the refrigerator **1**, such as the fan **44**, a compressor **60**, the ice making fan **2430**, and the like.

[0061] The ice maker **30** may include a temperature sensor **140**. The temperature sensor **140** may sense a temperature of the water or the ice in the ice tray **2100**. For example, the temperature sensor **140** is in the ice tray **2100** and may sense temperature of the water or the ice in the ice tray **2100**. In addition, the temperature sensor **140** may be or comprise a non-contact type temperature sensor **140** capable of sensing the temperature of a material or substance using a non-contact method, based on laser irradiation, irradiating the material or substance with infrared light, or the like. In other configurations of the ice maker **30**, the temperature sensor **140** may be inside the drive housing **2320**, the cover unit **2400**, the guide unit **2200**, the ice bucket **300**, or the case **100**, and may sense the temperature of the water or the ice in the ice tray **2100**.

[0062] The compressor **60** is at one side of the main body **10**. The compressor **60** is connected to the evaporator and is part of a path for circulating refrigerant in the refrigerator **1**. After heat-exchange in the evaporator, the refrigerant flows into the compressor **60**. The refrigerant absorbs ambient heat when it evaporates inside the evaporator, and may flow into the compressor **60** in a gas state and/or in a liquid state. The compressor **60** may compress the refrigerant and supply the compressed refrigerant back to the evaporator. The refrigerant supplied to the evaporator may be condensed into a liquid in the process of compression and/or being returned to the evaporator.

[0063] The controller **50** controls constitutional components of the refrigerator **1**. For example, the controller **50** may have one physical configuration at one side of the refrigerator **1** to control the ice maker **30**, a valve **150**, the compressor **60** and other constitutional components of the refrigerator **1**. Alternatively, the controller **50** may have two or more physical configurations, and they may be at one or more points or locations in the refrigerator **1**. In addition, part of the controller **50** may control the ice maker **30**, and other part(s) of the controller **50** may control other constitutional components of the refrigerator **1**. When the controller **50** has two or more physical configurations, each part of the controller is electrically connected to the other part(s), and may control various constitutional components of the refrigerator **1** in connection and/or cooperation with each other.

[0064] The amount of the cold air supplied to the ice maker **30** may vary according to the operational state of the compressor **60** and/or the fan **44**. The controller **50** may control the compressor **60** to stop the operation of the compressor **60** when the temperature of the storage room **11** is lower than a preset temperature and to operate the compressor **60** when the temperature of the storage room **11** is higher than the preset temperature. In addition, the controller **50** may control the fan **44** to operate when the temperature of the storage room **11** is higher than the preset temperature, in a manner similar to that of the compressor **60**. Accordingly, cold air is not supplied to the ice maker **30** when the temperature of the storage room **11** is lower than the preset temperature, and cold air may be supplied to the ice maker **30** only when the temperature of the storage room **11** is equal to or higher than the preset temperature. If the time during which the temperature of the storage room **11** is lower than the preset temperature exceeds a predetermined threshold, the time during which the cold air is supplied to the ice maker **30** is relatively short, and the water in the ice tray **2100** does not freeze effectively. Contrarily, the ice maker **30** in the refrigerator **1** according to the present invention may circulate air inside the ice maker **30** using the ice making fan **2430** so that the water may effectively freeze. The controller **50** may drive or operate the ice making fan **2430** when the compressor **60** is non-operational (e.g., stopped), when the fan **44** is non-operational (e.g., stopped), or when both the compressor **60** and the fan **44** are non-operational (e.g., stopped), so that the water may freeze using the cold air inside the ice maker **30** when cold air is not supplied to the ice maker **30**. In addition, the controller **50** may drive or operate the ice making fan **2430** when the compressor **60** is operating, when the fan **44** is operating, or when both the compressor **60** and the fan **44** are operating, so that the water may freeze more effectively.

[0065] According to one or more embodiments of the present invention, the ice making fan **2430** may be a constitutional component of the ice maker **30** or a part thereof other than the cover unit **2400**, inside the case **100**. For example, the ice making fan **2430** may be on the inner surface of the case **100**, on the outer surface of the ice bucket **300**, on the outer or inner surface of the guide unit **2200**, on one side or surface of the drive housing **2320**, or the like so that air may flow inside the case **100**.

[0066] According to an embodiment of the present invention, an ice maker that can effectively make ice and a refrigerator having the same can be provided.

[0067] In addition, an ice maker that can reduce the time required for freezing water and a refrigerator having the same can be provided.

[0068] The above detailed description provides examples of the present invention. In addition, the above description explains by showing preferred embodiments of the present invention, and the present invention may be used in various different combinations, changes and environments. That is, the present invention may be modified or changed within the scope of the spirit of the present invention disclosed in this specification, within a scope equivalent to the disclosed contents, and/or within the scope of the technique(s) or knowledge of the prior art. The above embodiments describe the best conditions for implementing the technical spirit of the present invention, and various changes in the specific application fields and usages of the present invention also can be made. Accordingly, the detailed description of the present invention as described above shows disclosed embodiments and is not intended to limit the present inven-

tion. In addition, the appended claims should be interpreted as also including other embodiments.

What is claimed is:

1. A refrigerator comprising:

a main body having a storage room therein;

a compressor at one side of the main body, configured to compress refrigerant;

a door on the main body, configured to open and close the storage room; and

an ice maker in the storage room, wherein the ice maker includes:

a case having an external shape;

an ice tray configured to contain water;

a guide unit under the ice tray, forming a path for flowing cold air;

an ice bucket under the guide unit and comprising a container having a concave center portion;

an ice making fan inside the case configured to generate or facilitate a flow of air; and

a rotation unit configured to move the ice in the ice tray to the ice bucket.

2. The refrigerator according to claim **1**, wherein the ice maker further includes a cover unit on or above the ice tray.

3. The refrigerator according to claim **2**, wherein the ice making fan is in the cover unit.

4. The refrigerator according to claim **3**, wherein the ice maker further includes a distribution panel having a preset area and a plurality of holes.

5. The refrigerator according to claim **4**, wherein the distribution panel is between the ice making fan and the ice tray.

6. The refrigerator according to claim **1**, wherein the ice making fan is on an inner surface of the case.

7. The refrigerator according to claim **1**, wherein the ice making fan is on an outer surface of the ice bucket.

8. The refrigerator according to claim **1**, wherein the ice making fan is in or on the guide unit.

9. The refrigerator according to claim **1**, further comprising a controller configured to control the ice making fan.

10. The refrigerator according to claim **9**, wherein the controller operates the ice making fan when the compressor is stopped.

11. An ice maker comprising:

a case having an external shape;

an ice tray configured to contain water;

a guide unit under the ice tray, forming a path for flowing cold air;

an ice bucket under the guide unit and comprising a container having a concave center portion;

a cover unit on or above the ice tray;

an ice making fan in or inside the cover unit; and

a rotation unit configured to move the ice in the ice tray to the ice bucket.

12. The ice maker according to claim **11**, further comprising a distribution panel having a preset area and having a plurality of holes.

13. The ice maker according to claim **12**, wherein the distribution panel is between the ice making fan and the ice tray.

14. The ice maker according to claim **13**, wherein the distribution panel is configured to distribute the air flow on or over the ice tray.

15. The ice maker according to claim **12**, wherein the ice making fan is configured to generate or facilitate an air flow inside the case.

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