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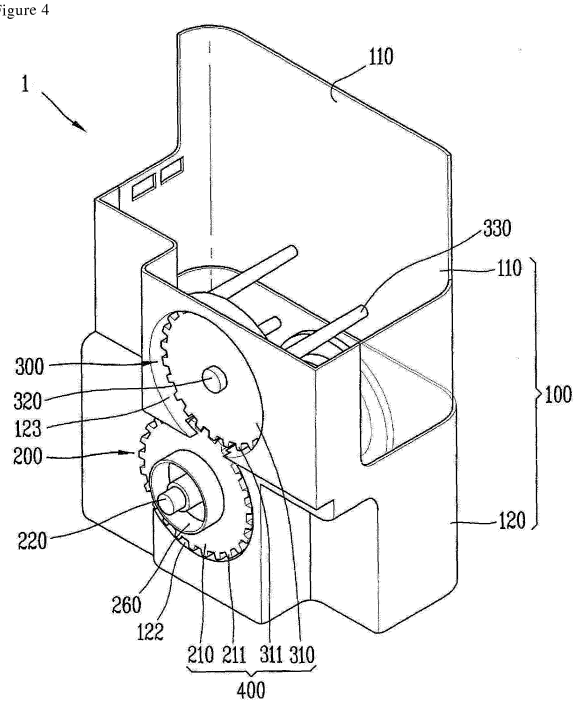
(54) REFRIGERATOR

(57) This specification relates to a refrigerator comprising an ice bucket having a function of unlaying ice curdling, capable of facilitating ice cubes to be drawn out by unlaying ice cubes, which are frozen in a curdled state due to being left for a long time at an upper portion within the ice bucket of an ice dispensing apparatus, which is disposed in a refrigerator or a water purifier having an ice maker to allow ice cubes to be ejected piece by piece.

The ice bucket includes a case main body forming an ice storage space therein and having an ice discharge port formed at a lower portion thereof, an ice ejecting member rotatably disposed at one side of the main body and having a motor rotation shaft, a blade mounting shaft, and a plurality of blades protruding from the blade mounting shaft in a radial direction and disposed in a circumferential direction with spaced distances, and an ice curdling unlaying member configured to prevent ice cubes located above the ice ejecting member from being frozen in a curdled state.

Figure 4



EP 3 176 523 A1

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] This specification relates to a refrigerator comprising an ice bucket having a function of unlaying ice curdling, and particularly, to an ice bucket having a function of unlaying ice curdling, capable of facilitating ice cubes to be drawn out by unlaying ice cubes, which are frozen in a curdled state due to being left for a long time at an upper portion within the ice bucket of an ice dispensing apparatus, which is disposed in a refrigerator or a water purifier having an ice maker to allow ice cubes to be ejected piece by piece.

2. Background of the Invention

[0002] In general, an ice maker is an apparatus installed in a refrigerator or a water purifier for self-producing ice pieces (cubes). In recent time, as consumer tastes for refrigerating machines, such as the refrigerator or the water purifier, are apt to become various and sophisticated, products that the ice maker is installed in the refrigerating machine are widely introduced.

[0003] The refrigerating machine further includes an ice dispensing (ejecting) apparatus which allows a user to pick up ice made in the ice maker without opening a door. The ice dispensing apparatus is configured to eject a predetermined quantity of ice cubes of a lot of ice cubes stored in an ice bucket as a storage chamber when the user selects ice ejection.

[0004] However, in the related art ice dispensing apparatus, a problem may occur that ice pieces or cubes stored in the ice bucket are not properly ejected. Especially, the ice dispensing apparatus also has a function of storing ice cubes at normal times, so it is maintained at a sub-zero temperature. Accordingly, when ice cubes located above blades disposed for ejecting the ice cubes are left for a long time, they are frozen in a curdled state.

[0005] Consequently, when the blades rotate to eject ice cubes, the blades may not reach the ice cubes located above it. This makes the blades make an idle rotation, causing the ice ejection to be impossible.

[0006] Hereinafter, an exemplary ice bucket installed in a refrigerator will be described with reference to FIGS. 1 to 3.

[0007] FIG. 1 shows a refrigerator having an ice maker and an ice dispensing apparatus according to the related art, and FIGS. 2 and 3 are perspective views each showing an ice bucket disposed in the ice dispensing apparatus.

[0008] In general, a refrigerator, which is a machine for keeping foods fresh in a refrigerating or frozen state, includes a refrigerator main body having a cooling chamber therein, and a refrigeration cycle system for providing cold air into the cooling chamber.

[0009] The refrigerating cycle system is implemented as a vapor compression type refrigeration cycle system, which typically includes a compressor for compressing a refrigerant, a condenser for condensing the refrigerant, an expansion apparatus for decompressing and expanding the refrigerant, and an evaporator for evaporating the refrigerant with ambient heat adsorbed.

[0010] Referring to FIG. 1, the refrigerator includes a refrigerant main body 10 having a freezing chamber 20 and a refrigerating chamber 30, and a freezing chamber door 25 and a refrigerating chamber door 35 for opening and closing the freezing chamber 20 and the refrigerating chamber 30, respectively.

[0011] In the meantime, a dispenser 27 is disposed in a portion of the refrigerator for allowing a user to take water and/or ice without opening the door 25, and an ice maker 40 is installed in the freezing chamber for making a preset shape of ice cubes. An ice bucket 1 for storing the ice cubes made in the ice maker or dispensing the ice cubes to the outside may be disposed below the ice maker 40.

[0012] The dispenser 27 is installed at the freezing chamber door 25 such that ice cubes can be picked up from the outside without opening the freezing chamber 20. An inlet port 29 through which ice cubes discharged from the ice bucket 1 is introduced into the dispenser 27 is formed through an upper surface of the dispenser 27.

[0013] The ice bucket 1 according to the related art, as shown in FIGS. 2 and 3, includes a case main body 100 forming an internal ice storage space and having an ice discharge port formed at its lower portion for discharging of ice, and an ice ejecting member 200 rotatably installed in the case main body 100 for ejecting ice to a lower side. The case main body 100 includes an upper case 110 and a lower case 120. In general, the upper case 110 may be transparent or semi-transparent to allow a user to check how many ice cubes are left in the internal ice storage space, and the ice ejecting member 200 is disposed on one side within the lower case 120.

[0014] The ice ejecting member 200 includes a blade mounting shaft 240 protruding from an inner surface of a lower portion of the lower case 120, and a plurality of blades 230 disposed on an outer circumferential surface of the blade mounting shaft 240.

[0015] Referring to FIGS. 2 and 3, an inclined inner wall 125 is formed at an inner wall of an upper portion of the body 100 so as to guide each ice dropped from the upper ice maker 40 into the ice ejecting member 200.

[0016] Here, in the related art ice bucket 1 having the configuration, each ice cube made in the ice maker is stacked up to an upper portion of the ice storage space within the case main body 100. However, while the ice ejecting member 200 is driven to eject the ice cubes, the ice cubes are continuously guided downward to be stored on a lower portion of the case main body 100 where the ice ejecting member 200 is disposed. On the other hand, when the ice pieces are left in the stacked state for a long time while the ice ejecting member 200 is not driven, the

ice pieces are wholly frozen in a curdled state due to the inside of the ice bucket 1 remaining at a sub-zero temperature.

[0017] Accordingly, even if the ice ejecting member 200 is driven with the ice cubes being wholly frozen in the curdled state, the upper ice pieces, which were frozen with being curdled into one within the ice bucket, are still maintained in an arcuately frozen state. This makes the ice ejecting member 200 perform an idle rotation such that the ice cubes cannot be ejected to the outside, disabling an ice ejecting function to be realized. Furthermore, the arcuately frozen ice pieces have to be broken into pieces by applying a separate external force for smoothly performing the ice ejecting function, causing a management problem.

SUMMARY OF THE INVENTION

[0018] Therefore, to overcome the shortcomings of the related art, an aspect of the detailed description is to provide an ice bucket having a function of unlaying ice curdling. And the ice bucket is capable of allowing an ice ejecting member to eject ice cubes to outside by unlaying the ice cubes frozen in a curdled state into individual ice pieces by use of augers. And the augers are rotated within a storage space of the ice bucket to unlay the curdled ice cubes, upon ejecting the ice cubes from an ice dispensing apparatus installed in a refrigerator or a water purifier.

[0019] To achieve these and other advantages and in accordance with the purpose of this specification, as embodied and broadly described herein, there is provided an ice bucket having a function of unlaying ice curdling. And the ice bucket includes a case main body forming an ice storage space therein and having an ice discharge port formed at a lower portion thereof. And the ice bucket includes an ice ejecting member rotatably disposed at one side of the main body and having a motor rotation shaft, a blade mounting shaft, and a plurality of blades protruding from the blade mounting shaft in a radial direction and disposed in a circumferential direction with spaced distances. And the ice bucket includes an ice curdling unlaying member configured to prevent ice cubes located above the ice ejecting member from being frozen in a curdled state.

[0020] In another aspect of the present disclosure, the ice curdling unlaying member may include a rotational shaft rotatably installed at an upper portion of one side of the main body. And the ice curdling unlaying member may include an auger protruding from an upper portion within the main body in an axial direction of the rotational shaft to unlay the upper curdled ice cubes in response to rotation of the rotational shaft.

[0021] Preferably, the auger may be installed by being spaced apart from the rotational shaft and performs a circular motion in response to the rotation of the rotational shaft to prevent ice curdling at an upper portion with the main body, and provided in plurality.

[0022] The ice curdling unlaying member may include a rotational cam rotatable centering on the rotational shaft, and the auger may be installed in plurality on the rotational cam to be in parallel to the rotation shaft.

[0023] In another aspect of the present disclosure, the case main body may include an upper case formed of a transparent or semi-transparent material to allow a stored state of ice cubes to be viewed from outside, and a lower case having an ice ejecting member mounted onto one side therein and allowing the ice ejecting member to be connected to an external driving motor.

[0024] Preferably, the ice discharge port may be formed at a lower portion of the lower case, and the ice curdling unlaying member may be formed on one side within the lower case.

[0025] In another aspect of the present disclosure, the ice ejecting member and the ice curdling unlaying member may receive a rotational force transferred by a driving force transfer unit. Here, the ice ejecting member may include a rotational cam rotatable by receiving the rotational force of an external driving motor, and the ice curdling unlaying member may include a rotational cam rotatable by receiving a rotational force transferred from the rotational cam of the ice ejecting member.

[0026] The driving force transfer unit may have a gear-like structure that teeth formed on an outer circumferential surface of the rotational cam of the ice ejecting member and teeth formed on an outer circumferential surface of the rotational cam of the ice curdling unlaying member are engaged with each other. And the ice curdling unlaying member may be rotatable by the rotational force of the ice ejecting member.

[0027] The case main body may include an ejecting member mounting portion formed through one side thereof for installation of the ice ejecting member thereon, and a curdling unlaying member mounting portion formed above the ejecting member mounting portion for installation of the ice curdling unlaying member thereon.

[0028] In another aspect of the present disclosure, the driving force transfer unit may be implemented such that transfer of a rotational force between a pulley formed on the ice ejecting member and a pulley formed on the ice curdling unlaying member is enabled via belts.

[0029] To achieve these and other advantages and in accordance with the purpose of this specification, as embodied and broadly described herein, there is provided a refrigerator including a refrigerator main body having a cooling chamber therein, a door to open or close the cooling chamber, and an ice maker disposed in the cooling chamber. And the refrigerator includes an ice bucket disposed below the ice maker, and a dispenser connected to the ice bucket.

[0030] Here, the ice bucket may include a case main body forming an ice storage space therein and having an ice discharge port formed at a lower portion thereof, an ice ejecting member rotatably disposed on one side of the main body and having a plurality of blades. And the ice bucket includes an ice curdling unlaying member

having a rotational shaft and an auger rotatable with performing a circular motion in response to rotation of the rotational shaft and configured to prevent ice cubes located above the ice ejecting member from being frozen in a curdled state.

[0031] The ice curdling unlaying member may include a rotational cam rotatable centering on the rotational shaft, and the auger may be provided in plurality disposed on the rotational cam to be in parallel to the rotational shaft. Also, the ice ejecting member and the ice curdling unlaying member may receive a rotational force transferred by a driving force transfer unit.

[0032] The driving force transfer unit may have a gear-like structure that teeth formed on an outer circumferential surface of the ice ejecting member and teeth formed on an outer circumferential surface of the ice curdling unlaying member are engaged with each other, and the ice curdling unlaying member may be rotatable by the rotational force of the ice ejecting member.

[0033] As described above, the present disclosure may achieve the following effects by the aforementioned solution and configuration and coupling and operating relation to be explained later.

[0034] Upon ejecting ice cubes from an ice dispensing apparatus installed in a refrigerator, a water purifier and the like, ice cubes in a curdled state may be unlaid by augers, which are disposed within a storage space of an ice bucket for unlaying ice curdling, and the unlaid ice cubes can be ejected to outside by an ice ejecting member.

[0035] Also, when ice cubes are stored for a long time in the storage space of the ice bucket without being ejected out of an ice dispending apparatus, even if the ice ejecting member is driven, ice cubes which are curdled into an arcuate shape still exist at an upper portion of the storage space of the ice bucket. To overcome this problem, the arcuately curdled ice cubes may be unlaid into pieces so as to prevent mis-operation of the ice ejecting member, resulting in enhancing convenience in use and economical efficiency.

[0036] Further scope of applicability of the present application will become more apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from the detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0037] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate exemplary embodiments and together with the description serve to explain the principles of the invention.

[0038] In the drawings:

FIG. 1 is a view showing a refrigerator having an ice maker and an ice dispensing apparatus according to the related art;

FIGS. 2 and 3 are perspective views each showing an ice bucket of the ice dispensing apparatus;

FIG. 4 is a perspective view of an ice bucket in accordance with the present disclosure; and

FIG. 5 is a sectional view of the ice bucket in accordance with the present disclosure.

DETAILED DESCRIPTION OF THE INVENTION

[0039] Description will now be given in detail of an ice bucket having a function of unlaying ice curdling according to the exemplary embodiments, with reference to the accompanying drawings. For the sake of brief description with reference to the drawings, the same or equivalent components will be provided with the same reference numbers, and description thereof will not be repeated.

[0040] In general, an ice bucket is installed in a refrigerator and the like to store ice cubes made in an ice maker of the refrigerator, and keep the ice pieces upon non-use of a dispenser. Also, upon ejecting ice cubes via a dispenser, blades mounted in the ice bucket may rotate to push the stored ice cubes to outside of the ice bucket.

[0041] In accordance with the present disclosure, blades are rotated upon ejecting ice cubes. An ice curdling unlaying member is then rotated in response to reception of a rotational force of the blades to make an auger(s), which break(s) (unlay(s)) curdled ice cubes, perform a circular motion. Accordingly, the auger unlays the curdled ice cubes stored at an upper portion within the ice bucket such that each ice cube can be dropped down to an ice ejecting member.

[0042] Hereinafter, description will be given of an ice bucket having a function of unlaying ice curdling according to the present disclosure, with reference to FIGS. 4 and 5. FIG. 4 is a perspective view of an ice bucket in accordance with the present disclosure, and FIG. 5 is a sectional view of the ice bucket in accordance with the preset disclosure.

[0043] An ice bucket 1 having a function of unlaying ice curdling may include a case main body 100 forming an internal ice storage space and having an ice discharge port 121 formed at its lower portion. And the ice bucket 1 includes an ice ejecting member 200 rotatably disposed on one side of the case main body 100. And the an ice ejecting member 200 has a motor rotation shaft 220, a blade mounting shaft 240, and a plurality of blades 230 protruding from the blade mounting shaft 240 in a radial direction and disposed in a circumferential direction with spaced distances therebetween. And the ice bucket 1 includes an ice curdling unlaying member 300 for pre-

venting ice cubes located above the ice ejecting member 200 from being frozen in a curdled state.

[0044] The case main body 100 and the ice ejecting member 200 have been fully explained in the related art, so the shapes and functions thereof will be briefly described hereinafter.

[0045] First, the case main body 100 may include an upper case 110 formed of a transparent or semi-transparent material for allowing a stored state of ice cubes to be viewed from outside. And the case main body 100 may include a lower case 120 having the ice ejecting member 200 mounted onto one side therein and allowing the ice ejecting member 200 to be connected to an external driving motor.

[0046] As shown in FIG. 4, the upper case 110 may be transparent or semi-transparent to be externally exposed, such that a user can check whether or not ice cubes are stored in the storage space of the ice bucket 10.

[0047] The lower case 120, as shown in FIG. 4, may form the lower portion of the body for mounting the ice ejecting member 200 thereon.

[0048] The ice discharge port 121 may be formed through the lower portion of the lower case 120 to communicate with a dispenser. The ice curdling unlaying member 300 may be formed at one side within the lower case 120. In particular, the ice curdling unlaying member 300, as shown in FIG. 4, may be mounted on one surface of the ice bucket 1 mounted on the refrigerator. And the other side of the ice bucket 1 may be viewed by a user through the transparent or semi-transparent upper case 110.

[0049] The ice ejecting member 200 may be rotatable in response to a rotational force transferred by an external driving motor installed in the refrigerator. The ice ejecting member 200 may include a motor rotation shaft 220 fixed onto a shaft of the external driving motor, and a motor rotational force transfer portion 260 for transferring the rotational force received from the external driving motor.

[0050] The ice ejecting member 200 may include a blade mounting shaft 240 integrally or fixedly connected to the motor rotation shaft 220 in a lengthwise direction to be inserted into the ice bucket 1. A plurality of blades 230 may be formed on an outer circumferential surface of the blade mounting shaft 240 so as to transfer ice cubes from an upper ice maker to a lower dispenser via the ice discharge port 121.

[0051] The ice curdling unlaying member 300 may include a rotational shaft rotatably installed on an upper portion of the case main body 100. And the ice curdling unlaying member 300 includes an auger 330 protruding from an upper portion within the case main body 100 in a lateral direction to unlay curdled ice cubes located at the upper portion in response to rotation of the rotational shaft 320.

[0052] Referring to FIGS. 4 and 5, the auger 330 may protrude in a lateral direction of the ice curdling unlaying member 300, and be provided in plurality. Also, the plurality of augers 330 may be installed in parallel to the rotational shaft 320, performing a circular motion within the ice bucket 1 in response to the rotation of the rotational shaft 320. Accordingly, the augers 330 may stir the curdled ice cubes located at the upper portion within the case main body 100, unlaying the curdled ice cubes.

[0053] In another exemplary embodiment, referring to FIG. 4, the ice curdling unlaying member 300 may include a rotational cam 310 rotatable centering on the rotational shaft 320, and the plurality of augers 330 may be installed on the rotational cam 310 in parallel to the rotational shaft 310.

[0054] The rotational cam 310, referring to FIG. 4, may be formed as a circular plate, which has a predetermined thickness and is rotatable based upon the rotational shaft 310, so as to be installed on one side of the lower case 120. The plurality of augers 330 may protrude from one surface of the rotational cam 310 in an axial direction to be in parallel to the rotational shaft 310.

[0055] With the configuration, as shown in FIG. 4, as the ice curdling unlaying member 300 is rotated, the plurality of augers 330 protruding into the case main body 100 in parallel to the rotational shaft 320 may unlay the curdled ice cubes. That is, with the rotational cam 310 being rotated, the augers 330 may perform a circular motion to break ice cubes located above the ice ejecting member 200 into individual pieces even when the ice cubes are frozen in the curdled state.

[0056] Here, the case main body 100 may include an ejecting member mounting portion 122 formed through one side thereof for installation of the ice ejecting member 200 thereat. And preferably a curdling unlaying member mounting portion 123 may be formed above the ejecting member mounting portion 122 for installation of the ice curdling unlaying member 300 thereat.

[0057] The ejecting member mounting portion 122, as shown in FIG. 4, may preferably be formed as a through hole in a circular shape because it should be connected to an external driving motor. Here, the curdling unlaying member mounting portion 123 should be formed through the case main body 100 to be connected to an external driving motor when the external driving motor is provided separately. However, as shown in the exemplary embodiment of the present disclosure, the curdling unlaying member mounting portion 123 may not have to be formed as a separate through hole when being rotated by receiving the rotational force of the ice ejecting member 200.

[0058] The ice curdling unlaying member 300 may perform a rotary motion based on the rotational shaft 320. This rotary motion may be performed by receiving an external rotational force. In this case, rotational forces may be applied to the ice ejecting member 200 and to the ice curdling unlaying member 300, respectively, allowing independent operations of the ice ejecting member 200 and the ice curdling unlaying member 300.

[0059] The present disclosure may simultaneously implement both functions of unlaying ice curdling and ejecting ice cubes by receiving a single rotational force. When a rotational force is applied only to the ice ejecting mem-

ber 200, the ice curdling unlaying member 300 may simultaneously be rotated by receiving the rotational force of the ice ejecting member 200. On the other hand, when the rotational force is applied only to the ice curdling unlaying member 300, the ice ejecting member 200 may simultaneously be rotated. And the ice ejecting member 200 may be rotated by receiving the rotational force applied to the ice curdling unlaying member 300 without an external rotational force applied thereto.

[0060] When the present disclosure is implemented by use of a single rotational force, the ice ejecting member 200 and the ice curdling unlaying member 300 may receive a rotational force via a driving force transfer unit 400.

[0061] Preferably, as shown in FIG. 4, a motor rotational force transfer portion 260 for transferring a received rotational force directly to the blades 230 may be formed at the ice ejecting member 200. The motor rotational force transfer portion 260 may be connected to a driving motor (not shown) at an outer wall of the lower case 120. The motor rotational force transfer portion 260 may be cylindrically installed on an outer circumference of the motor rotation shaft 220 of the ice ejecting member 200, receiving the rotational force of the motor.

[0062] Accordingly, the ice ejecting member 200 may include a rotational cam 210 rotatable by receiving a rotational force of an external driving motor via the motor rotational force transfer portion 260. And the ice curdling unlaying member 300 may include a rotational cam 310 rotatable by receiving a rotational force from the rotational cam 210 of the ice ejecting member 200.

[0063] The rotational cam 210 of the ice ejecting member 200 and the rotational cam 310 of the ice curdling unlaying member 300 may be allowed to mutually transfer their rotational forces by virtue of the driving force transfer unit 400. The driving force transfer unit 400 may be implemented by employing a variety of rotational force transfer elements, such as gears, pulleys and belts and the like.

[0064] Referring to FIG. 4, when a rotational force transfer element having a gear-like structure is employed as the driving force transfer unit 400, teeth 211 formed on an outer circumferential surface of the rotational cam 210 of the ice ejecting member 200. And the teeth 311 formed on an outer circumferential surface of the rotational cam 310 of the ice curdling unlaying member 300 may be engaged with each other in the gear-like structure.

[0065] The rotational cams 210 and 310 having the gear-like structure with the mutually engaged teeth 211 and 311 may allow the ice curdling unlaying member 300 to be rotatable in response to the rotational force transferred from the ice ejecting member 200. Therefore, when the ice ejecting member 200 is driven, its upper ice curdling unlaying member 300 may operate simultaneously. Accordingly, ice cubes, which are arcuately frozen in the curdled state at the upper portion of the blades 330 due to being stored for a long time, may be unlaid into pieces. The individually unlaid ice cubes may be transferred downward, and ejected by the ice ejecting member 200 via the ice discharge port 121, thereby being provided to a dispenser.

[0066] Although not shown, the driving force transfer unit 400 may be implemented such that the transfer of a rotational force between a pulley formed at the ice ejecting member 200 and a pulley formed at the ice curdling unlaying member is enabled via belts.

[0067] Therefore, the rotational cams 210 and 310 of the ice electing member 200 and the ice curdling unlaying member 300 may preferably be formed as pulleys having belts mounted thereon.

[0068] Hereinafter, description will be given of a refrigerator having the ice bucket 1 according to another exemplary embodiment with reference to FIGS. 1 and 4. FIG. 1 shows the refrigerator having the ice bucket 1 according to the related art, but a refrigerator according to the present disclosure may be fully described with reference to the ice bucket 1 having the ice curdling unlaying member 300 shown in FIG. 4.

[0069] A refrigerator according to the present disclosure may include doors 25 and 35 for opening and closing a cooling chamber, an ice maker 40 disposed in the cooling chamber, an ice bucket 1 disposed below the ice maker 40, and a dispenser 27 connected to the ice bucket 1. Here, the ice bucket 1 may include a case main body 100 forming an ice storage space therein and having an ice discharge port at a lower portion thereof. And an ice ejecting member 200 is rotatably disposed at one side of the case main body 100 and having a plurality of blades 330. Also the ice bucket 1 includes an ice curdling unlaying member 300 having a rotational shaft 320 and augers 330 performing a circular motion in response to rotation of the rotational shaft 320. And the ice curdling unlaying member 300 is configured to prevent ice cubes located above the ice ejecting member 200 from being frozen in a curdled state.

[0070] Also, the ice curdling unlaying member 300 may include a rotational cam 310 rotatable centering on the rotational shaft 320, and the plurality of augers 330 may be installed on the rotational cam 310 with being spaced apart from the rotational shaft 320 in parallel to each other.

[0071] The ice ejecting member 200 and the ice curdling unlaying member 300 may receive a rotational force transferred by a driving force transfer unit 400.

[0072] Preferably, the driving force transfer unit 400 may have a gear-like structure that teeth 211 formed on an outer circumferential surface of the rotational cam 210 of the ice ejecting member 200 and teeth 311 formed on an outer circumferential surface of the rotational cam 310 of the ice curdling unlaying member 300 are engaged with each other. Also, the ice curdling unlaying member 300 may be rotated in response to a rotational force transferred from the ice ejecting member 200.

[0073] Alternatively, the driving force transfer unit 400 may be implemented such that the rotational cam 210 of

the ice ejecting member 200 and the rotational cam 310 of the ice curdling unlaying member 300 are formed as pulleys to transfer a rotational force by use of belts.

[0074] The foregoing embodiments and advantages are merely exemplary and are not to be construed as limiting the present disclosure. The present teachings can be readily applied to other types of apparatuses. This description is intended to be illustrative, and not to limit the scope of the claims. Many alternatives, modifications, and variations will be apparent to those skilled in the art. The features, structures, methods, and other characteristics of the exemplary embodiments described herein may be combined in various ways to obtain additional and/or alternative exemplary embodiments.

[0075] As the present features may be embodied in several forms without departing from the characteristics thereof, it should also be understood that the above-described embodiments are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed broadly within its scope as defined in the appended claims, and therefore all changes and modifications that fall within the metes and bounds of the claims, or equivalents of such metes and bounds are therefore intended to be embraced by the appended claims.

Examples

[0076]

1. An ice bucket having a function of unlaying ice curdling, and comprising:

- a case main body (100) forming an ice storage space therein and having an ice discharge port (121) formed at a lower portion thereof,
- an ice ejecting member (200) rotatably disposed at one side of the main body (100) and having a motor rotation shaft (220), a blade mounting shaft (240), and a plurality of blades (230) protruding from the blade mounting shaft (240) in a radial direction and disposed in a circumferential direction with spaced distances,
  characterized by further comprising:
  - an ice curdling unlaying member (300) configured to prevent ice cubes transported toward the ice ejecting member (200) from being frozen in a curdled state.

2. The ice bucket of example 1, wherein the ice curdling unlaying member (300) comprises:

a rotational shaft (320) rotatably installed at an upper portion of one side of the main body (100); and
at least one auger (330) protruding from an upper portion within the main body in an axial direction of the rotational shaft to unlay the upper curdled ice cubes in response to rotation of the rotational shaft (320).

3. The ice bucket of example 2, wherein the auger (330) is installed in parallel to the rotational shaft (320) and performs a circular motion in response to the rotation of the rotational shaft (320) to prevent ice curdling at an upper portion with the main body (100).

4. The ice bucket of example 2 or 3, wherein a plurality of augers (330) is provided.

5. The ice bucket of example 2, 3 or 4 wherein the ice curdling unlaying member (300) comprises a rotational cam (310) rotatable centering on the rotational shaft (320), and wherein the auger (330) is installed on the rotational cam (310).

6. The ice bucket of anyone of the preceding examples, wherein the case main body (100) comprises:

an upper case (110) formed of a transparent or semi-transparent material to allow a stored state of ice cubes to be viewed from outside; and
a lower case (120) having an ice ejecting member (200) mounted onto one side therein and allowing the ice ejecting member (200) to be connected to an external driving motor.

7. The ice bucket of example 6, wherein the ice discharge port (121) is formed at a lower portion of the lower case (120), and
wherein the ice curdling unlaying member (300) is formed on one side within the lower case (120).

8. The ice bucket of anyone of the preceding examples, wherein the ice ejecting member (200) or the ice curdling unlaying member (300) receive a rotational force transferred by a driving force transfer unit (400).

9. The ice bucket of example 8, wherein the ice ejecting member (200) comprises a rotational cam (210) rotatable by receiving the rotational force of an external driving motor, and
wherein the ice curdling unlaying member (300) comprises a rotational cam (310) rotatable by receiving a rotational force transferred from the rotational cam (210) of the ice ejecting member (200).

10. The ice bucket of example 9, wherein the driving force transfer unit (400) has a gear-like structure that teeth (211) formed on an outer circumferential surface of the rotational cam (210) of the ice ejecting member (200) and teeth (311) formed on an outer circumferential surface of the rotational cam (310)

of the ice curdling unlaying member (300) are engaged with each other, and
wherein the ice curdling unlaying member (300) is rotatable by the rotational force of the ice ejecting member (200).

11. The ice bucket of example 8, wherein the driving force transfer unit (400) comprises a pulley formed on the ice ejecting member (200) and a pulley formed on the ice curdling unlaying member (300), wherein a transfer of a rotational force between the pulleys is enabled via belts.

12. The ice bucket of anyone of the preceding examples, wherein the case main body (100) comprises:

an ejecting member mounting portion (122) formed through one side thereof for installation of the ice ejecting member (200) thereon; and
a curdling unlaying member mounting portion (123) formed above the ejecting member (200) mounting portion for installation of the ice curdling unlaying member (300) thereon.

Claims

1. A refrigerator, comprising:

a freezing chamber (20);
a freezing chamber door (25) to open and close the freezing chamber (20) and having an inlet port (29);
an ice maker (40) for making ice cubes; and
an ice bucket (10) for storing the ice cubes made by the ice maker,
characterized in that
the ice bucket (10) comprises :

a case main body (100) forming an ice storage space;
a motor rotation shaft (220) installed at the case main body (100) and fixed onto a shaft of an external driving motor;
a plurality of blades (230) installed in the case main body (100); and
an ice curdling unlaying member (300) to prevent the ice cubes in the case main body (100) from being frozen in a curdled state,
the ice curdling unalying member (300) comprises:

a rotational cam (310) installed at the case main body (100) and rotatable centering on a rotational shaft (320); and
an auger (330) to unlay curdled ice cubes in the case main body (100).

2. The refrigerator of claim 1, wherein the auger (330) is installed on the rotational cam (310), the auger (330) provided in plurality.

3. The refrigerator of claim 1 or 2, wherein the case main body (100) comprises:

an upper case (110) formed of a transparent or semi-transparent material to allow a stored state of ice cubes to be viewed from outside; and
a lower case (120) having an ice ejecting member (200) mounted onto one side therein and allowing the ice ejecting member (200) to be connected to an external driving motor and having an ice discharge port (121) formed at a lower portion thereof.

4. The refrigerator of claim 3, wherein the ice discharge port (121) is formed at a lower portion of the lower case (120), and
wherein the ice curdling unlaying member (300) is formed on one side within the lower case (120).

5. The refrigerator of one of claims 1 to 4, further comprising an ice ejecting member (200) having the motor rotation shaft (220) and the plurality of blades (230); and rotatably disposed at one side of the case main body (100) to eject the ice cubes in the case main body (100),
wherein the ice ejecting member (200) further comprises a blade mounting shaft (240) connected to the motor rotation shaft (220) in a lengthwise direction, and
wherein the plurality of blades (230) protrude from the blade mounting shaft (240) in a radial direction and are disposed in a circumferential direction with spaced distances.

6. The refrigerator of claim 5, wherein the case main body (100) comprises:

an ejecting member mounting portion (122) formed through one side thereof for installation of the ice ejecting member (200) thereon; and
a curdling unlaying member mounting portion (123) formed above the ejecting member mounting portion (122) for installation of the ice curdling unlaying member (300) thereon.

7. The refrigerator of one of claims 1 to 6, further comprising a dispenser (27) disposed in the freezing chamber door (25) and having the inlet port (29) through which ice cubes discharged from the ice bucket (10) are introduced into the dispenser (27).

8. The refrigerator of one of claims 1 to 7, wherein the

ice curdling unlaying member (300) receives a rotational force transferred by a driving force transfer unit (400).

9. The refrigerator of claim 8, wherein the case main body (100) is provided with a rotational cam (210) disposed above the rotational cam (310) of the ice curdling unalying member (300), and
wherein the driving force transfer unit (400) has a gear-like structure that teeth (211) formed on an outer circumferential surface of the rotational cam (210) and teeth (311) formed on an outer circumferential surface of the rotational cam (310) of the ice curdling unlaying member (300) are engaged with each other.

10. The refrigerator of one of claims 1 to 9, wherein a motor rotational force transfer portion (260) is cylindrically installed on an outer circumference of the motor rotation shaft (220) to transfer a received rotational force directly to the plurality of blades (230).

Figure 1

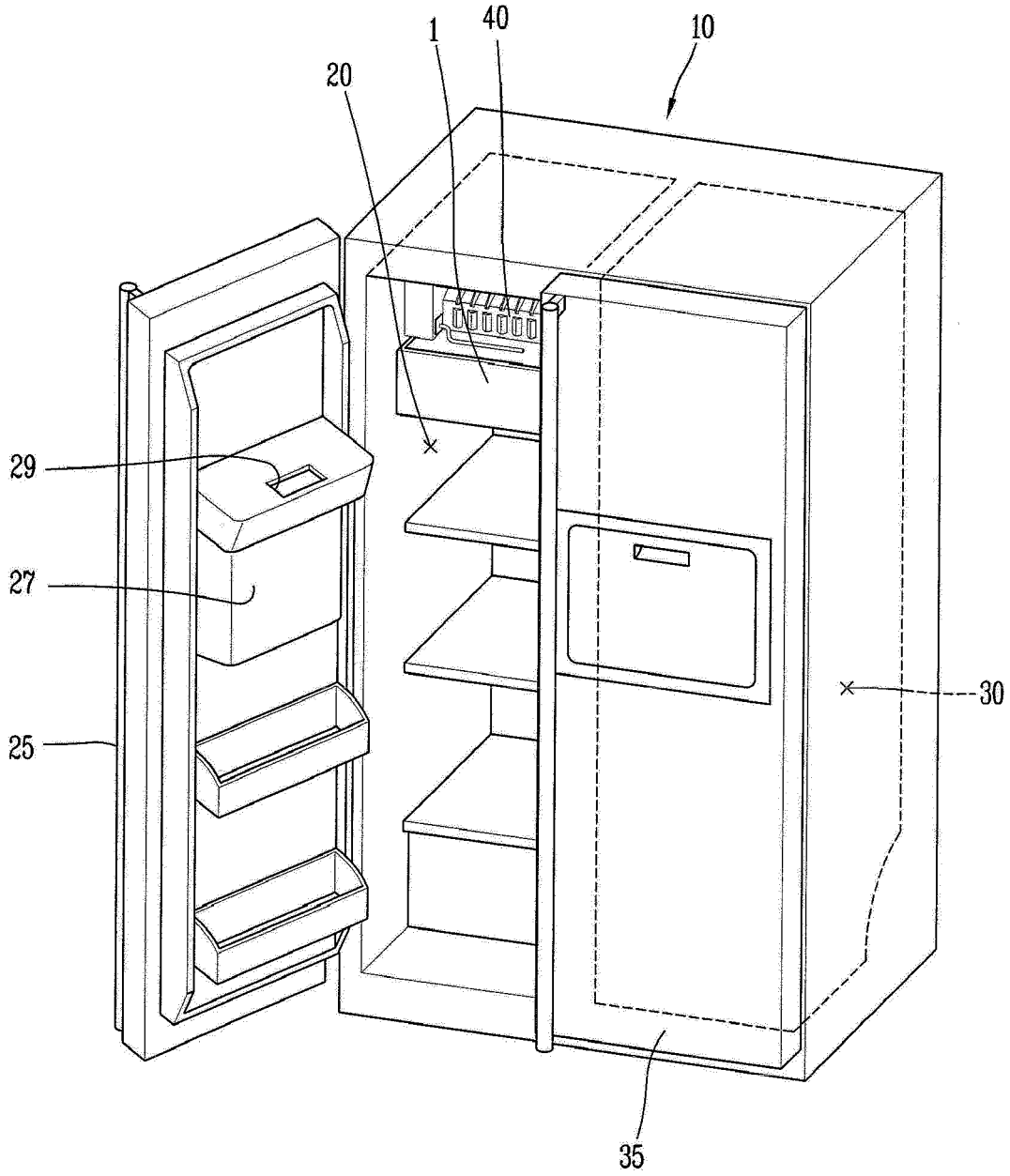


Figure 2

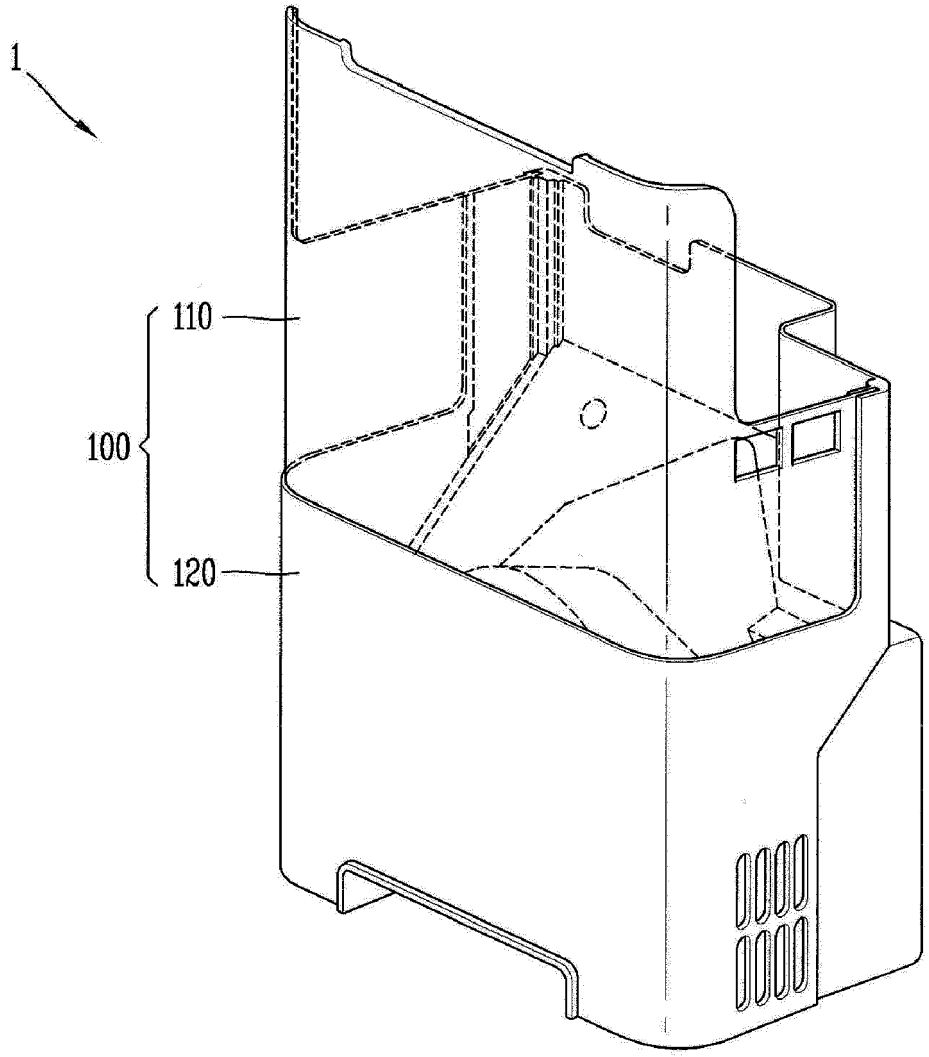


Figure 3

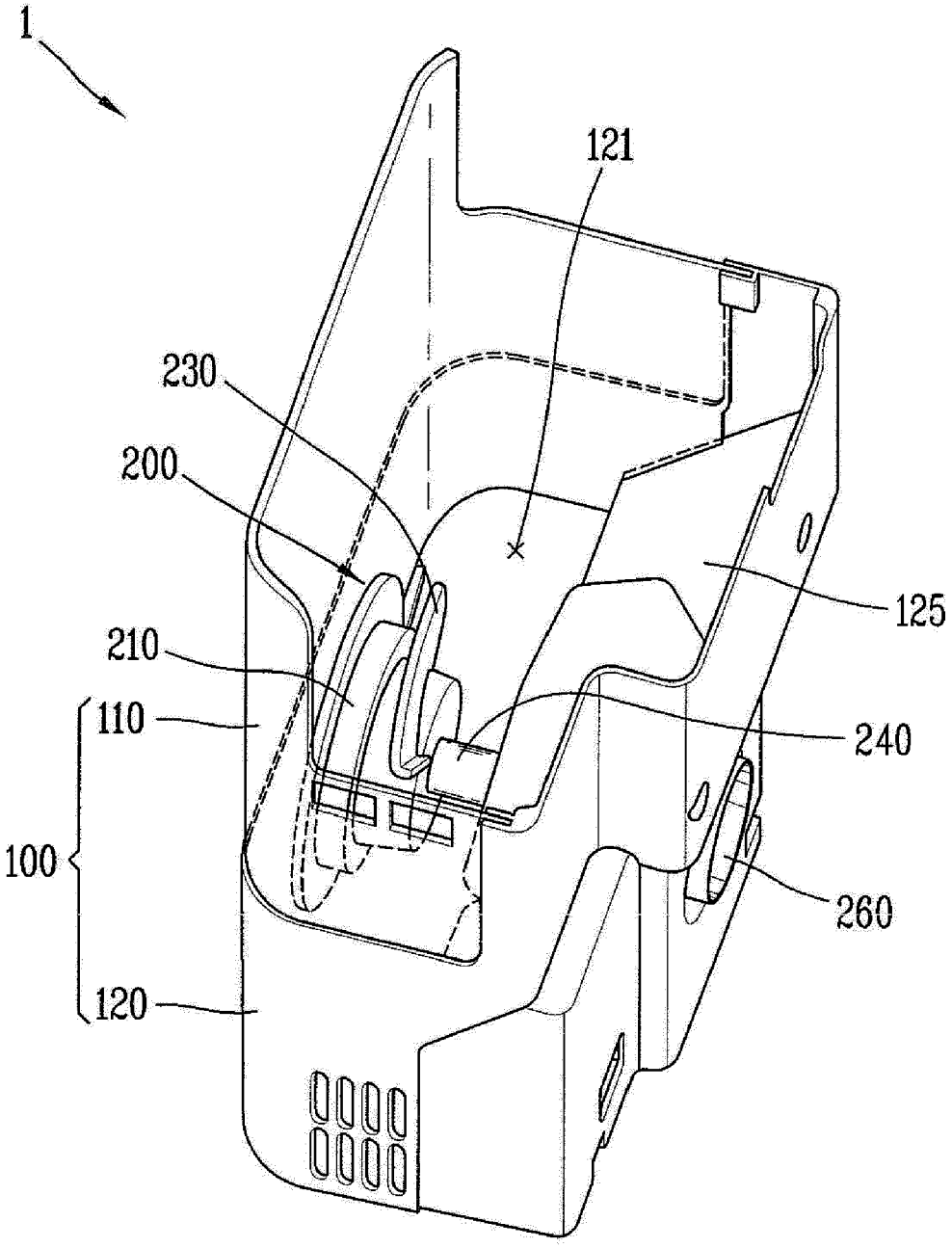


Figure 4

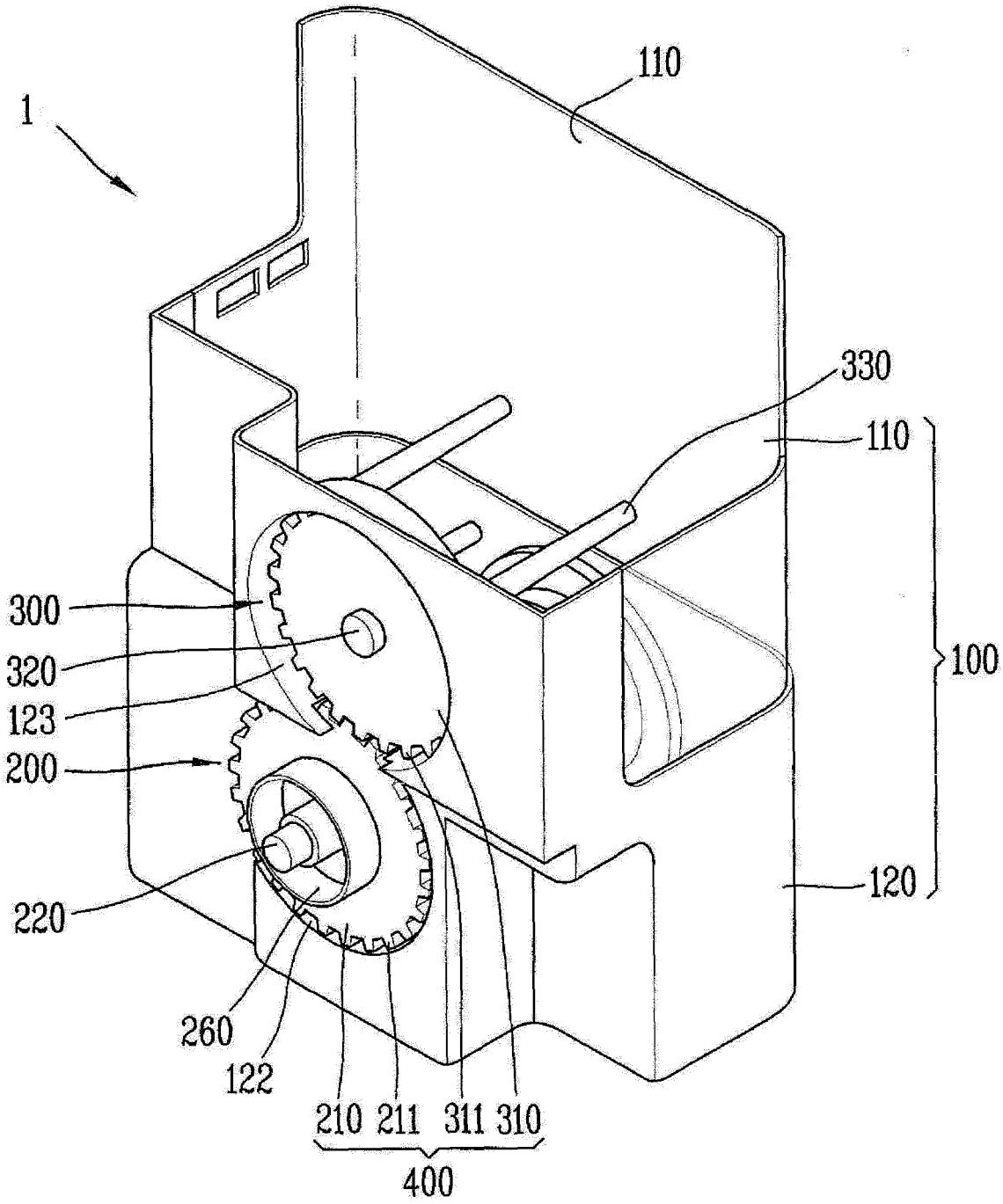
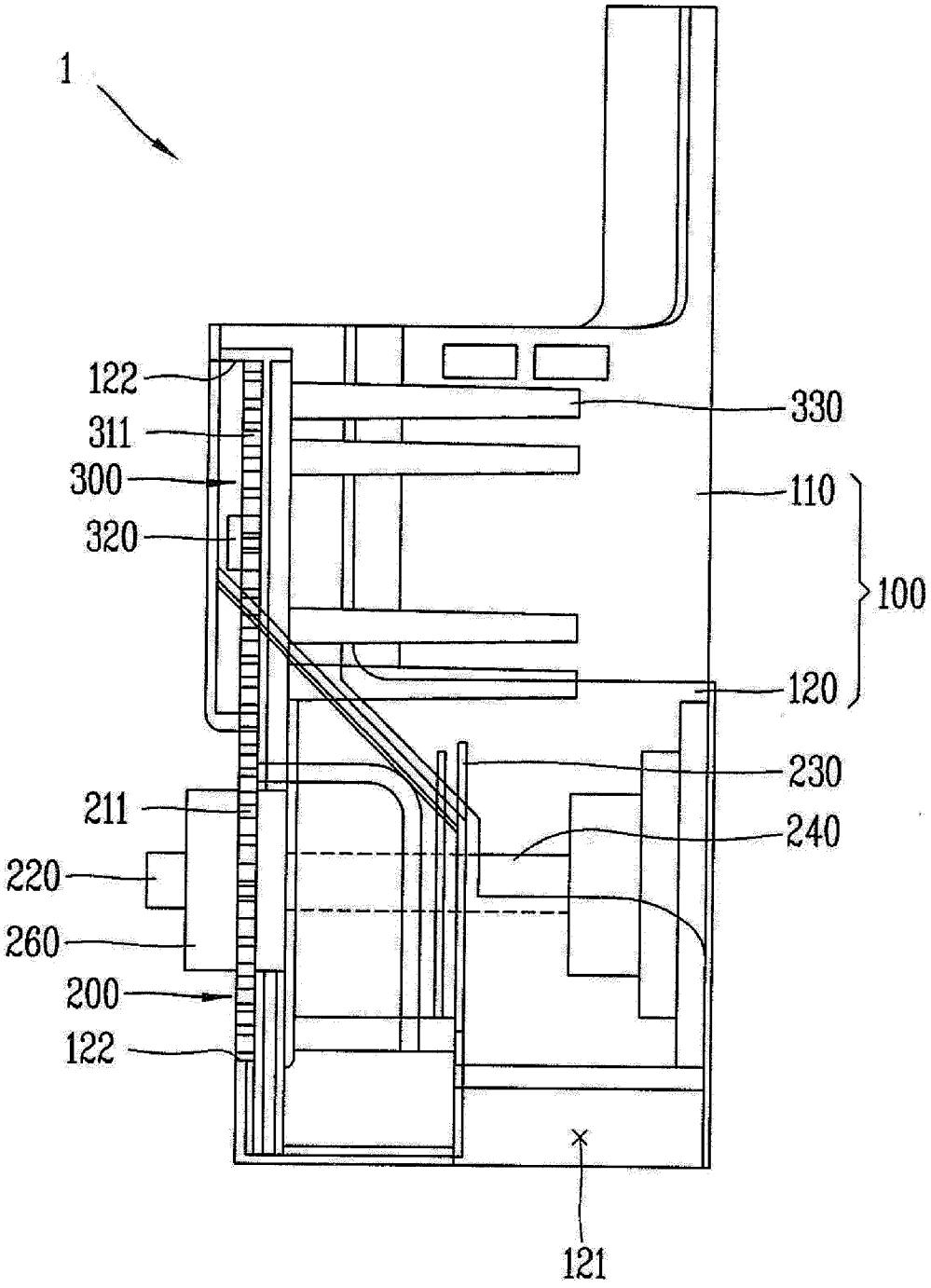

1
110
330
110
100
300
320
123
200
220
120
260
122
210
211
311
310
400

Figure 5



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EUROPEAN SEARCH REPORT

Application Number
EP 16 20 1156

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Place of search	Date of completion of the search	Examiner
Munich	12 April 2017	Jessen, Flemming

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