



US 20100281908A1

(19) **United States**  
(12) **Patent Application Publication**  
**Kim**

(10) **Pub. No.: US 2010/0281908 A1**  
(43) **Pub. Date: Nov. 11, 2010**

(54) **REFRIGERATOR WITH ICE DISPENSER**

**Publication Classification**

(76) Inventor: **Dong-Wan Kim,**  
Gyeongsangnam-Do (KR)

(51) **Int. Cl.**  
*F25C 5/18* (2006.01)  
*F25D 17/04* (2006.01)  
(52) **U.S. Cl.** ..... **62/344; 62/420**

Correspondence Address:  
**BIRCH STEWART KOLASCH & BIRCH**  
**PO BOX 747**  
**FALLS CHURCH, VA 22040-0747 (US)**

(57) **ABSTRACT**

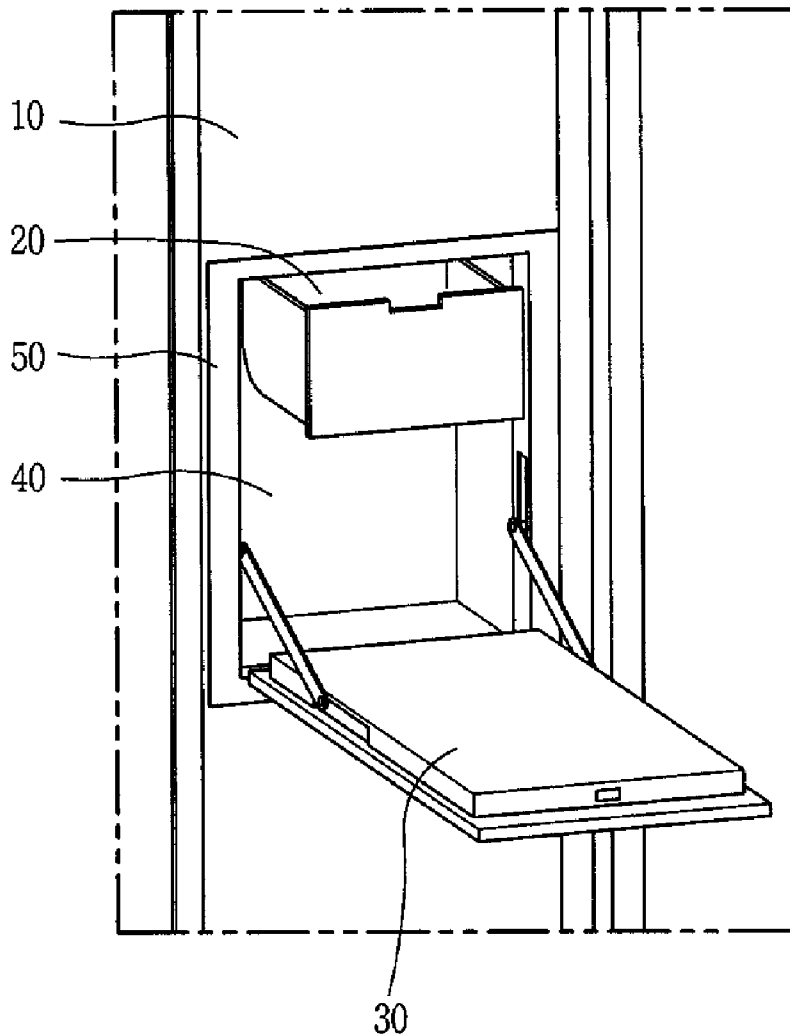
A refrigerator having an ice dispenser, which comprises: a basket installed inside a door of the refrigerator; a home bar door installed at the door and configured to open/close the basket; an ice dispenser located at an upper portion of the basket; an ice container configured to store pieces of ice to be supplied to the ice dispenser; and a switching unit configured to switch on or off the operation of the ice dispenser. Hence, since a home bar door of a home bar having an ice dispenser therein is maintained in a state of completely closing the home bar, such home bar can serve as a storage for storing goods. Also, pieces of ice can be ejected by simply pressing a dispenser lever, other than extending the ice container, resulting in an increase in convenience of use.

(21) Appl. No.: **12/812,584**

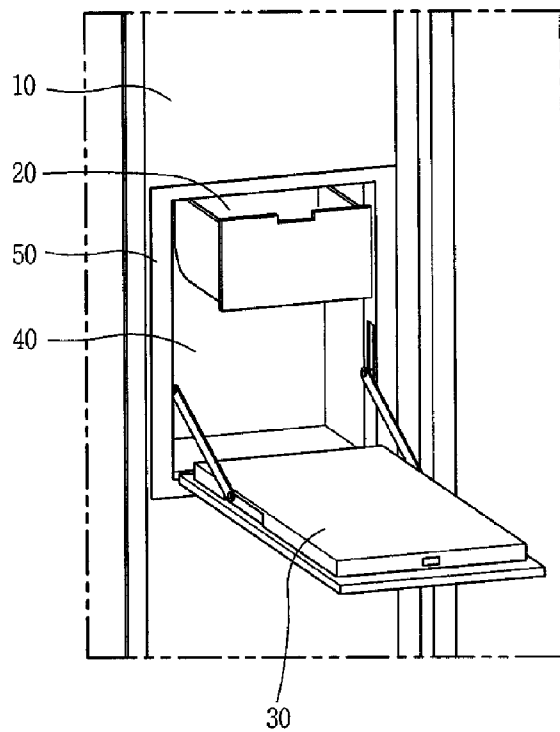
(22) PCT Filed: **Sep. 8, 2008**

(86) PCT No.: **PCT/KR2008/005295**

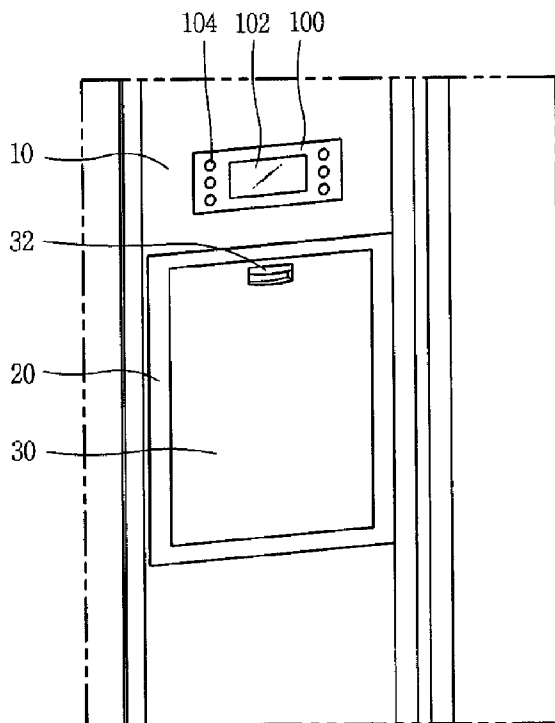
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(2), (4) Date: **Jul. 12, 2010**



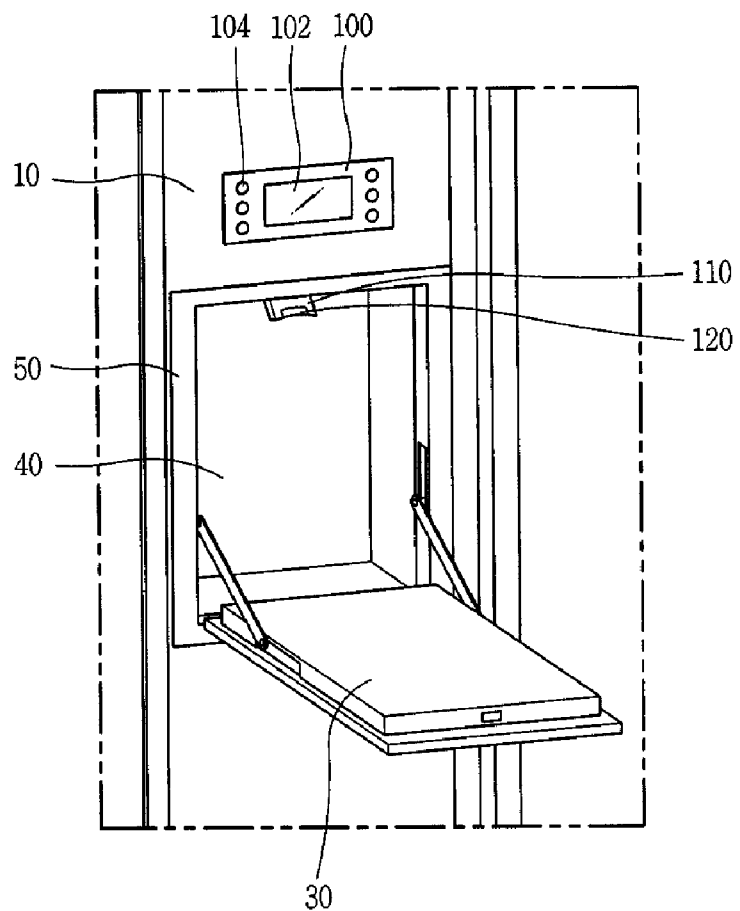
[Fig. 1]



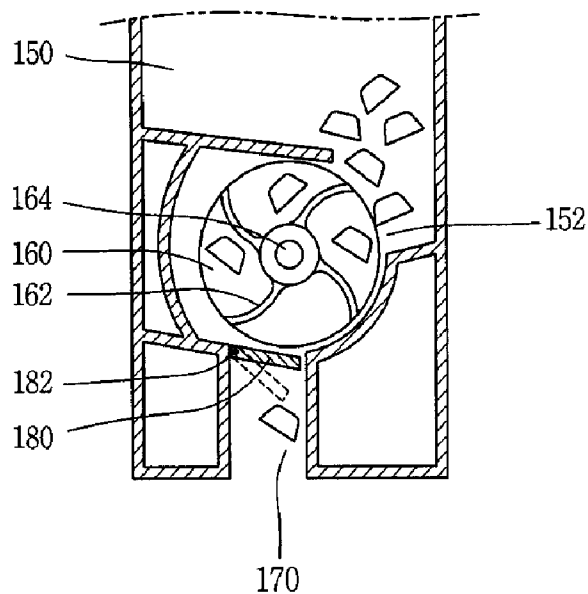
[Fig. 2]



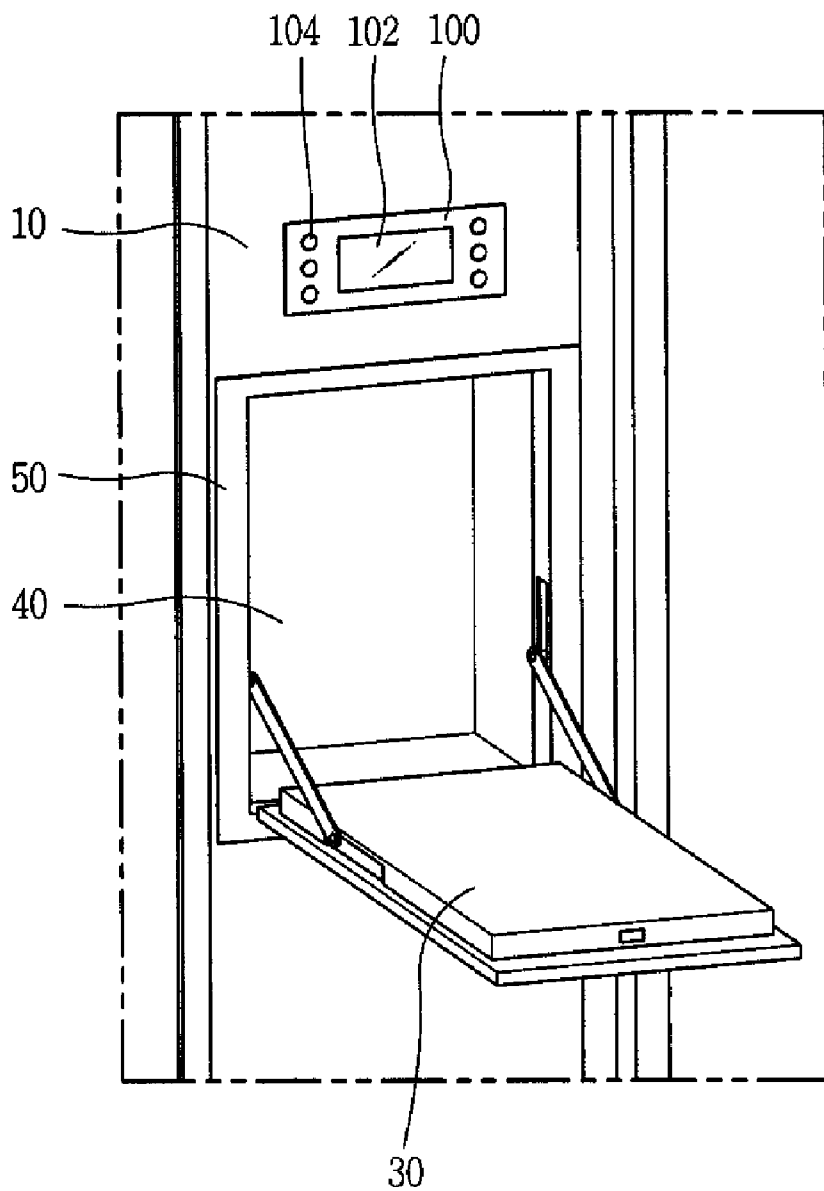
[Fig. 3]



[Fig. 4]



[Fig. 5]



**REFRIGERATOR WITH ICE DISPENSER**

TECHNICAL FIELD

[0001] The present invention relates to a refrigerator with an ice dispenser, and more particularly, to a refrigerator having an ice dispenser installed on a door thereof so as to dispense pieces of ice outside the door.

BACKGROUND ART

[0002] A refrigerator is a type of home appliance used for freshly storing foods in a refrigerated or frozen state. A typical refrigerator is configured to generate cold air by a compression type cooling system using a refrigerant, blow such cold air to an inner space, namely, in refrigerating chamber and a freezing chamber, thus to perform refrigerating and freezing functions.

[0003] Accordingly, it is required to reduce energy consumed during the driving of the refrigerating cycle. To this end, various methods have been proposed. Among others, there is an approach for increasing an efficiency of the refrigerating cycle. In order to achieve this, many technologies have been developed to improve the performance of a compressor or condenser configuring the refrigerating cycle and reduce other losses.

[0004] Another approach is to minimize cold air consumption during the use of the refrigerating cycle. A representative one is a so-called home bar, which has a space for storing drinks or frequently dispensed commodities in a door for opening/closing the refrigerating or freezing chamber of the refrigerator, and installs a small door for opening/closing such space, so as to allow a user to take such drinks or commodities out without opening/closing the door of the refrigerator. Accordingly, the loss of cold air can be minimized and also the user's convenience can be enhanced, and thusly, the home bar has gained popularity.

[0005] The home bar can be installed at any one of the refrigerating chamber or the freezing chamber, or at both of them. Here, a home bar installed at the freezing chamber is used for simply storing foods or the like. However, it is also used as a space for dispensing ice cubes (e.g., pieces of ice, ice, etc.) in cooperation with an icemaker installed in the freezing chamber.

[0006] FIG. 1 shows an exemplary home bar 20 for dispensing ice cubes. As shown in FIG. 1, a home bar door 30 installed outside a freezing chamber door 10, and a basket 40 is internally installed, which is seen when the home bar door 30 is open. An ice storing container 50 configuring part of an icemaker is exposed above the basket 40 (i.e., FIG. 1 shows an extended state of the ice storing container 50). Accordingly, a user opens the home bar door 30 and pulls the ice storing container 50 with a hand so as to get ice cubes stored in the container 50. Hence, the user can take ice cubes without opening the freezing chamber door 10, thus to reduce consumption of cold air.

[0007] However, for the example shown in FIG. 1, the user first opens the home bar door and then pulls the ice container in order to pick up ice cubes, which requires an unnecessary operation. In particular, such taken ice cubes may usually be put in water or other beverages. If ice cubes are picked up as shown in the example, it is not good for sanitary reasons. It could be thought of using ice tongs, but the inconvenience of use grows heavier.

[0008] In the meantime, in the above example, a considerable portion of the inner space of the home bar is occupied by the ice container, thereby decreasing a spatial efficiency. Also, the upper portion of the home bar should remain empty in case of pulling the ice container, several goods such as a long bottle are difficult to be stored.

DISCLOSURE

[Technical Solution]

[0009] To solve those drawbacks of the related art, an object of the present invention is to provide a refrigerator with an ice dispenser capable of improving convenience of use of the ice dispenser located inside a home bar.

[0010] Another object of the present invention is to provide a refrigerator with an ice dispenser capable of more efficiently using an inner space of a home bar in which the ice dispenser is disposed.

[0011] To achieve those objects of the present invention, there is provided a refrigerator with an ice dispenser including: a basket installed inside a door of the refrigerator; a home bar door installed at the door and configured to open/close the basket; an ice dispenser located at an upper portion of the basket; an ice container configured to store pieces of ice to be supplied to the ice dispenser; and a switching unit configured to switch on or off the operation of the ice dispenser.

[0012] In accordance with one aspect of the present invention, cold air contained in the refrigerator is introduced into the home bar having the ice dispenser, and also the home bar door for closing the basket is installed at a front surface of the refrigerator, thus to be able to store goods even in the home bar having the ice dispenser. Also, pieces of ice can automatically be ejected from the ice dispenser located at an upper portion of the basket by manipulating a switching unit.

[0013] Here, the switching unit may include a lever installed at an upper end portion of the basket; and a controller configured to control the operation of the ice dispenser in cooperation with a motion of the lever, wherein the ice dispenser is operated only while the lever is pressed, thus to eject pieces of ice. For example, upon pressing the lever with a cup or the like, pieces of ice can be ejected, thereby increasing convenience of the manipulation.

[0014] In another aspect of the present invention, the switching unit may include a manipulation button disposed on an outside of the door. Accordingly, the ice dispenser is allowed to be operated only while the manipulation button is pressed so as to have pieces of ice ejected. In this case, a user can press the manipulation button on the door at the outside so as to take pieces of ice, by which the configuration of the device can be simplified.

[0015] Cold air can be provided into the basket in various manners. As one example, a penetration groove through which such cold air flows into the basket is formed through the basket, so as to allow cold air circulating in the freezing chamber to be introduced via the penetration groove.

[0016] The home bar door has one end fixed to the door by a hinge, so as to be rotated based upon the hinge, thereby opening/closing the basket. Moreover, the home bar door can be configured to be slid in a direction parallel with the door surface inside the door so as to open/close the basket.

[0017] The ice dispenser can be implemented as a certain type of device which can electrically be driven. One example can be implemented by employing a type of ice dispenser including an inlet in which pieces of ice are introduced from

the ice container, a transfer member rotatably installed below the inlet, and having a plurality of vanes radially extending in a spiral shape, and an outlet located below the transfer member and communicated with the basket.

[0018] Here, pieces of ice transferred from the inlet toward the transfer member are carried toward the outlet in cooperation with the rotation of the transfer member, thus to be dispensed to the basket.

[0019] Preferably, the ice dispenser further includes a shutter blocking the outlet and opened when being pressed by a piece of ice carried by the transfer member, and an elastic member for applying an elastic force to the shutter so as to maintain the closed state thereof.

#### DESCRIPTION OF DRAWINGS

[0020] FIG. 1 is a perspective view schematically showing a related art refrigerator with a home bar installed at a freezing chamber;

[0021] FIG. 2 is a perspective view showing a closed state of a home bar door of a refrigerator with an ice dispenser in accordance with a first embodiment of the present invention;

[0022] FIG. 3 is a perspective view showing an open state of the home bar door in the first embodiment of FIG. 2;

[0023] FIG. 4 is a front view schematically showing the ice dispenser in the first embodiment shown in FIG. 2; and

[0024] FIG. 5 is a view showing a refrigerator with an ice dispenser in accordance with a second embodiment of the present invention.

#### MODE FOR INVENTION

[0025] Hereinafter, description will be given in detail of a refrigerator with an ice dispenser according to the present invention with reference to the accompanying drawings.

[0026] FIG. 2 is a perspective view showing an ice dispenser in accordance with a first embodiment of the present invention. For the sake of explanation, only a freezing chamber door 10 is illustrated, and also other components configuring a refrigerator are the same or similar to those of a typical refrigerator, description of which will thusly be omitted.

[0027] FIG. 2 shows a closed state of a home bar door 30 shown in a first embodiment. A home bar 20 is installed at the freezing chamber door 10. A handle 32 as an opening/closing element for opening/closing the home bar door 30 is installed at an upper portion of the home bar door 30.

[0028] Also, a manipulation panel 100 disposed to be spaced apart from the home bar 20 is located above the home bar 20. A display device 102 for displaying an operational state of the refrigerator (e.g., set temperature, whether various functions are activated, and the like) is disposed at the center of the manipulation panel 100. A plurality of manipulation buttons 104 operated in a pushing manner, for manipulating the refrigerator, are positioned near the display device 102.

[0029] FIG. 3 is a perspective view showing an open state of the home bar door 30 in the first embodiment. The lower portion of the home bar door 30 is coupled to the door 10 by a hinge (not shown), so as to be rotated centering around the hinge, thereby being open to show the inside of the home bar 20. A basket 40 configuring a space for storing goods is formed inside the home bar 20. A penetration groove (not shown) is formed through a wall surface of the basket 40. The penetration groove is communicated with the inside of the freezing chamber, such that cold air circulating in the freezing chamber can be introduced into the basket 40.

[0030] Therefore, the basket 40 can serve as a space for storing the goods in a frozen state. Such space provided by the basket 40 can be used as a space for storing goods which are frequently taken out. In addition, two link members are installed at both side surfaces of the home bar door 30, so as to stably support the home bar door 30 in the open state. Accordingly, the home bar door 30 may also serve as a shelf on which goods are temporarily put in the completely open state as shown in FIG. 3.

[0031] In FIG. 2, the home bar door 30 is hinge-coupled; however, the present invention is not limited to such hinge. The home bar door 30 is allowed to be slid up and down inside the door 10, thus to open the home bar 20.

[0032] In the meantime, a dispenser lever 110 is installed at an upper end of the basket 40. The dispenser lever 110 is inclinedly installed so as to be penetrated through the upper end of the basket 40 and then protruded outwardly. The dispenser lever 110 is rotated by a force that a user presses a cup or the like for operation. The detailed components of the dispenser lever 110 can use typically known components, and therefore they will not be described in detail herein. Here, in order to prevent a slipping of the cup when pressing the dispenser lever 110 with the cup, an anti-slipping portion 120 formed of rubber made of a synthetic resin is installed at a front end of the dispenser lever 110.

[0033] When the dispenser lever 110 is pressed by a user, a switching unit disposed at an inside of the door 10 to be adjacent to the dispenser lever 110 operates an ice dispenser installed within the door 10.

[0034] The ice dispenser will be described in more detail with reference to FIG. 4.

[0035] An ice container 150 is disposed at a rear surface of a portion of the door 10 on which the manipulation panel 100 is located. The ice container 150 serves to store ice cubes (pieces of ice) generated by an icemaker installed in the freezing chamber. An inlet 152 serving as a path through which the stored ice cubes move is formed at a lower portion of the ice container 152. The inlet 152 is located at a right upper portion (see FIG. 4) of a transfer member 160 for forcibly carrying ice cubes, and an outlet 170 for discharging ice cubes carried via the transfer member 160 is located below the transfer member 160.

[0036] One end portion of a shutter 180 for blocking the outlet 170 is coupled to the outlet 170 by a hinge 182. That is, the shutter 180 is rotated centering around the hinge 182 to thusly open/close the outlet 170. The hinge 182 is coupled to a coil spring. Hence, the state that the shutter 180 closes the outlet 170 can be maintained by the coil spring under a state of no external force applied.

[0037] The transfer member 160 includes four vanes 162 extending outwardly in a radial direction on the basis of a rotational shaft 164. The vane 162 has a spiral section. In addition, although not shown, the rotational shaft 164 is connected to a motor as a driving unit such that the transfer member 160 can be rotated by the motor. The driving of the motor may be controlled by the switching unit. In other words, when the dispenser lever 110 is pressed by a cup, power is supplied to the motor by the switching unit which is electrically or mechanically in cooperation with such motion, and as a result, the transfer member 160 is rotated counter-clockwise.

[0038] Accordingly, among ice cubes near the inlet 152, ice cubes contacted with the vanes 162 of the transfer member 160 are carried to the left in a state of being held between the

vanes 162, thus to be located on the shutter 180. In cooperation with the continuous rotation of the transfer member 160, the vane 162 downwardly presses the ice cube located on the shutter 180. As a result, the shutter 180 is rotated clockwise to open the outlet 170, thereby dropping the ice cube into the basket 40.

[0039] Hence, the user can take such ice cubes out only by pressing the dispenser lever using a cup with grabbing the cup with one hand, thereby enhancing convenience of use. In addition, since most of the space of the basket 40 can be used, thus to increase an efficiency of the space in the basket 40.

[0040] Here, the transfer member having vanes in the spiral shape has been used as the ice dispenser; however, the present invention is not limited to this. An ice dispenser configured such that a link member connected to the dispenser lever can be used to open/close a shutter mechanically or electrically can also be used. Among others, an embodiment employing an ice dispenser, configured such that an electric motor is connected to a hinge shaft of a shutter such that the shutter is opened by the electric motor while the lever is pressed so as to drop ice cubes, can also be regarded.

[0041] Hereinafter, a refrigerator having an ice dispenser in accordance with a second embodiment of the present invention will be described with reference to FIG. 5.

[0042] The second embodiment has the same configuration to that of the first embodiment having described with reference to FIGS. 2 to 4, excluding that a dispenser lever for operating an ice dispenser is not employed. Thus, the difference from the first embodiment is only described for the second embodiment, and the description of the same components will not be repeated.

[0043] As shown in FIG. 5, the outlet 170 of the ice dispenser is communicated with an upper portion of the basket 40, and a dispenser lever is not employed. However, one of manipulation buttons 104 disposed on the manipulation panel 100 is allocated as a button for operating the transfer member 160 of the ice dispenser. That is, when a user presses the manipulation button 104, the transfer member 160 is rotated to eject ice cubes. Hence, after placing a cup or the like below the outlet 170, upon pressing the manipulation button 104, ice cubes can be ejected.

[0044] Therefore, the second embodiment can extend a usable space of the basket 40, resulting in an increase in a spatial efficiency.

[0045] FIG. 5 shows an example using a pushing type of manipulation button as a unit for manipulating the transfer member 160; however, the present invention is limited to the pushing type. Various types of switches which are typically used can also be used. For example, by configuring the display device 102 on the manipulation panel as a type of touch panel, a button for manipulating the transfer member 160 can be integrally implemented in the display device 102.

[0046] The present invention has been explained with reference to the embodiments which are merely exemplary. It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention

without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

[0047] As described above, since a home bar door of a home bar having an ice dispenser therein is maintained in a state of completely closing the home bar, such home bar can serve as a storage for storing goods. Also, ice cubes can be ejected by simply pressing a dispenser lever, other than extending an ice container, resulting in an increase in convenience of use.

[0048] Also, a manipulation button can be used for ejecting ice cubes, thus to use an inner space of the home bar more efficiently.

1. A refrigerator having an ice dispenser comprising:
  - a basket installed inside a door of the refrigerator;
  - a home bar door installed at the door and configured to open/close the basket;
  - an ice dispenser located at an upper portion of the basket;
  - an ice container configured to store pieces of ice to be supplied to the ice dispenser; and
  - a switching unit configured to switch on or off the operation of the ice dispenser.
2. The refrigerator of claim 1, wherein the switching unit comprises:
  - a lever installed at an upper end portion of the basket; and
  - a controller configured to control the operation of the ice dispenser in cooperation with a motion of the lever, wherein the ice dispenser is operated only while the lever is pressed, thus to eject pieces of ice.
3. The refrigerator of claim 1, wherein the switching unit comprises a manipulation button disposed on an outside of the door, the ice dispenser being operated only while the lever is pressed, thus to eject pieces of ice.
4. The refrigerator of claim 1, wherein the penetration groove is formed such that cold air keeps flowing into the basket.
5. The refrigerator of claim 1, wherein the home bar door has one end fixed to the door by a hinge.
6. The refrigerator of claim 1, wherein the ice dispenser comprises:
  - an inlet in which pieces of ice are introduced from the ice container;
  - a transfer member rotatably installed below the inlet, and having a plurality of vanes radially extending in a spiral shape; and
  - an outlet located below the transfer member and communicated with the basket.
7. The refrigerator of claim 6, wherein the ice dispenser further comprises:
  - a shutter blocking the outlet and opened when being pressed by a piece of ice carried by the transfer member; and
  - an elastic member for applying an elastic force to the shutter so as to maintain the closed state thereof.

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