CLEANING DEVICE OF ICE MAKER AND CLEANING METHOD THEREOF

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Disclosed are a cleaning device of an ice maker and a method thereof. In the cleaning device of an ice maker and a method thereof according to embodiments of the present invention, since the cleaning block is detachably coupled to the ejector to clean the ice making container, a cleaning operation can be easily performed on the ice making container, which is difficult for an operator to directly clean, thereby enhancing quality of ice made by the ice maker.
FIG. 5

S1  SELECT CLEANING PREPARATION

S2  PREPARE MOUNTING OF CLEANING BLOCK

S3  DETECT RESIDUAL ICE

S4  MOUNT CLEANING BLOCK

S5  PERFORM CLEANING OPERATION

S6  PREPARE SEPARATION OF CLEANING BLOCK

S7  COMPLETE CLEANING
CLEANING DEVICE OF ICE MAKER AND CLEANING METHOD THEREOF

TECHNICAL FIELD

[0001] The present invention relates to an ice maker and, more particularly, to a cleaning device of an ice maker and a method thereof capable of cleaning an ice making container that makes ice.

BACKGROUND ART

[0002] In general, a household refrigerator is a device having a certain accommodation space to keep food items, or the like, at a certain temperature. A refrigerator is divided into a refrigerating chamber maintained above zero in a low temperature range and a freezing chamber maintained below zero in the low temperature range. Recently, as demand for ice rises, refrigerators having a cleaning block that makes ice are increasing.

[0003] The automatic ice maker (referred to as an ‘ice maker’, hereinafter) may be installed in the freezing chamber or in the refrigerating chamber according to types of refrigerators. When the ice maker is installed in the refrigerating chamber, cold air in the freezing chamber is guided (or provided) to the ice maker to make ice.

[0004] Ice makers may be divided into a twist type ice maker, an ejector type ice maker, and a rotation type ice maker depending on how ice made by the ice maker is released. The twist type ice maker releases ice by twisting an ice making container. The ejector type ice maker draws up release ice from the ice container by an ejector installed at an upper portion of the ice making container. The rotation type ice maker releases ice from the ice making container by rotating the ice making container.

DISCLOSURE

Technical Problem

[0005] However, the related ice makers do not have an apparatus or method for cleaning debris or a foreign object when such things are generated in the ice making container as the ice makers are used for a long time, having a limitation in providing clean ice. In particular, in case of the ice releasing method using an ejector, since the ejector is positioned at an upper portion of the ice making container, a cleaning operation of the ice making container is limited or the ice maker should be disassembled for a cleaning operation, causing user inconvenience.

[0006] Therefore, an object of the present invention is to provide a cleaning device of an ice maker and a method thereof capable of easily cleaning an ice making container although the ice maker has an ejector disposed at an upper portion of the ice making container.

Technical Solution

[0007] According to an aspect of the present invention, there is provided a cleaning device of an ice maker including: an ice making container having one or more ice making spaces formed to receive water to make ice; an ejector installed at an upper portion of the ice making container, having at least one ejector pin, and drawing up ice to release ice; and a cleaning block detachably coupled to the ejector and cleaning the ice making spaces of the ice making container.

[0008] According to another aspect of the present invention, there is provided a cleaning method of an ice maker, including: a cleaning preparation step of rotating an ejector configured to draw up ice from an ice making container such that the ejector is positioned to allow a cleaning block for cleaning the ice making container to be easily inserted thereto; a cleaning step of rotating the ejector to allow the cleaning block to clean the ice making container; and a cleaning separation step of rotating the ejector such that the ejector is positioned to allow the cleaning block to be easily separated from the ejector.

Advantageous Effects

[0009] In the cleaning device of an ice maker and a method thereof according to embodiments of the present invention, since the cleaning block is detachably coupled to the ejector to clean the ice making container, a cleaning operation can be easily performed on the ice making container, which is difficult for an operator to directly clean, thereby enhancing quality of ice made by the ice maker.

DRAWING OF DRAWINGS

[0010] FIG. 1 is an exploded perspective view of a cleaning block of an ice maker according to an embodiment of the present invention.

[0011] FIG. 2 is an assembled perspective view of the cleaning block of the ice maker in FIG. 1.

[0012] FIG. 3 is a sectional view taken along line I-I in FIG. 2.

[0013] FIG. 4 is a schematic view showing a cleaning process of the ice maker in FIG. 1.

[0014] FIG. 5 is a block diagram illustrating a process of making ice by the ice maker in FIG. 1.

BEST MODES

[0015] A cleaning device of an ice maker and a method thereof according to embodiments of the present invention will be described in detail with reference to the accompanying drawings.

[0016] FIG. 1 is an exploded perspective view of a cleaning block of an ice maker according to an embodiment of the present invention. FIG. 2 is an assembled perspective view of the cleaning block of the ice maker in FIG. 1. FIG. 3 is a sectional view taken along line I-I in FIG. 2. FIG. 4 is a schematic view showing a cleaning process of the ice maker in FIG. 1. FIG. 5 is a flow chart illustrating a process of making ice by the ice maker in FIG. 1.

[0017] As illustrated, the ice maker according to an embodiment of the present invention includes an ice making container 110, an ejector 120 disposed at an upper portion of the ice making container 110 and releasing ice, a driving unit 130 driving the ejector 120, and a storage tank 140 receiving ice made in the ice making container 110 and storing the same.

[0018] The ice making container 110 has an ice making space 111 having a substantially semi-cylindrical shape in section, and partition projections 113 are formed on an inner circumferential surface of the ice making container 110 and divide the ice making space 111 into several unit spaces 112 to make several ice cubes having a certain size at a time. A sliding plate 114 is formed at one side of an opening surface.
of the ice making container 110 in order to guide ice released by the ejector 120 to the storage bank 140 after being separated by ejector pins 122.

[0019] An ice sensor 115 may be mounted on a lower surface of the sliding plate 114 in order to determine whether or not ice remains in the ice making space 111. However, the present invention is not limited thereto and the ice sensor 115 may be installed in the ice making space 111 or may be installed on a different member or position. As the ice sensor 115, a contact type sensor or a non-contact type sensor may be used so long as it can detect whether or not ice remains in the ice making space 111.

[0020] The ejector 120 includes a rotary shaft 121 installed to traverse the center of the ice making container 110 and the plurality of ejector pins 122 vertically protruded from the rotary shaft 121 to draw up ice 1 or allowing the cleaning block 150 to be inserted and rotated for a cleaning operation. The ejector pins 122 are installed to correspond in a one-to-one manner to each of unit spaces 112 divided by the partition protrusions 113 such that ice within each unit space 112 can be discharged from the ice making container 110 as the ejector pins 122 are rotated.

[0021] Here, the cleaning block 150 may be made of one of materials such as sponge, tissue, nonwoven fabric, and the like, that may be used to wipe out foreign objects. In this case, there may be a limitation to firmly couple the cleaning block 150 to the ejector pins 122. Thus, the cleaning block 150 may include a fixed unit fixed to the ejector pins 122 and a cleaning unit 152 coupled to the fixed unit to perform cleaning. The fixed unit 151 may be made of a material, such as plastic, rubber, ceramic, or the like, having certain strength, and the cleaning unit 152 may be made of a material having detergency.

[0022] As shown in FIGS. 1 and 2, the cleaning block 150 may be formed by grouping, uniting, assembling, or integrating a plurality of cleaning block units as a batch, or each of a plurality of cleaning block units may be separately provided (as a single piece). For example, when a plurality of cleaning blocks are grouped as a batch, as shown in FIGS. 1 and 2, the plurality of cleaning units 152 may be coupled to a single fixed unit 151. Pin insertion recesses 153 may be formed on an upper surface of the fixed unit 151 to correspond to the ejector pins 122 such that the ejector pins 122 can be inserted and coupled therein.

[0023] The driving unit 130 includes a motor box (not shown) installed at one side of the ejector 120, a driving motor (not shown) provided within the motor box 131 an rotating the ejector 120 in both directions, and deceleration gear (not shown) decelerating a rotation speed of the driving motor 132.

[0024] Reference numeral 141 denotes a storage space.

[0025] An ice making process of the ice maker according to an embodiment of the present invention is as follows.

[0026] Namely, when ice making is required, the ice maker (not shown) is turned on and an ice making operation starts. When the ice making starts, a water supply unit (not shown) supplies water to the ice making space 111 of the ice making container 110. When the supply of water is completed, water within the ice making container 110 is exposed to cold air within a cooling chamber for more than a certain time and frozen.

[0027] And then, when the temperature of the ice making container 110 is dropped to be lower than a certain temperature, or when a certain time has elapsed after the water supply, it is determined that ice making has been completed and a process of releasing ice starts.

[0028] In order to release ice, as shown in FIG. 4, the driving motor 132 of the driving unit 130 is rotated in one direction to rotate the ejector 120 in a forward direction. Then, the ejector pins 122 rotate in the forward direction to draw up ice from the unit space 112 of the ice making container and rotate the ice. Then, the ice (or ice cubes) are rotated along the ejector pins 122, caught by the sliding plate 114 so as to be separated from the ejector pins 122, and then, slides along the sliding plate 114 and is dropped to be stored in the storage space 141 of the storage bank 140.

[0029] However, when the foregoing ice making operation is repeatedly performed, a foreign object such as scale (or fur), or the like, are formed on the ice making container 110. When a cleaning operation is not performed, such a foreign object may cling to ice to degrade quality of ice, so, preferably, the ice making operation is stopped at every certain period and a cleaning operation is performed.

[0030] The cleaning operation is performed as shown in FIG. 5.

[0031] First, an operator selects a cleaning preparation button (not shown) provided in the refrigeration door or the ice making to stop the ice making operation (step S1). Then, the ejector pins 122 of the ejector 120 are rotated and stopped at a certain angle, e.g., an angle of about 30° with respect to a vertical direction (step S2). At this angle, the operator can easily insert the cleaning block 150 to the ejector pins 122. At this time, the ice sensor 114 operates to determine whether or not there is ice in the ice making container 110. When ice remains, the ejector 120 is operated to completely release ice, thus removing ice from the ice making container (step S3).

[0032] Next, the operator inserts the cleaning block 150 to the ejector pins 122 to prepare a cleaning operation (step S4). In this case, a detergent or a chemical may be applied to enhance the cleaning effect.

[0033] And then, the operator presses a cleaning start button. Then, the ejector 120 is rotated in one direction or in both directions by the driving motor 132 and the cleaning block 150 coupled to the ejector pins 122 wipes the ice making space 111 of the ice making container 110 to remove a foreign object such as scale, or the like (step S5). In this case, a chemical advantageous for cleaning may be applied to the cleaning block 150 to perform the cleaning operation. The cleaning operation may be performed for a period of time previously set by the operator or may be performed for a period of time set in the cleaning device.

[0034] Thereafter, when the cleaning operation is completed, the ejector pins 122 of the ejector 120 are rotated at a certain angle, i.e., at the foregoing angle at which the cleaning block 150 can be easily inserted (step S6). At this angle, the operator can easily separate the cleaning block 150. At this time, a step of determining, by the operator, whether or not the cleaning block 150 separated from the ejector 120 remains in the ice making container 110 by using an extra sensor (not shown) may be further performed. When the cleaning block 150 remains, the ejector 120 may be further rotated in a separation direction to secure a withdrawal space, and then, the operator may completely collect (or draw out) the cleaning block 150. This process may be particularly advantageous when the cleaning block 150 is formed as a single piece.
And then, the operator selects a cleaning completion button (not shown) to transfer information that the cleaning operation has been completed to a controller of a pertinent refrigerator, so that an ice making operation may be performed (step S7).

In this manner, the cleaning block is detachably coupled to the ejector to clean the ice making container. Thus, the operator can easily perform cleaning operation on the ice making container, which is difficult for the operator to directly clean, thus enhancing quality of ice made in the ice maker.

Meanwhile, although not shown, in the refrigerator employing the ice maker, the ice maker is generally installed in a freezing chamber or on a freezing chamber door of the freezing chamber. Also, in this case, the cleaning device of the ice maker may be configured to be operated in the same manner as described above, and have the same operational effect as described above.

INDUSTRIAL APPLICABILITY

The ice cleaning device of the ice maker and the cleaning method thereof according to embodiments of the present invention can be applied to a product formed as an ice make alone, as well as to an ice maker applied to a refrigerator.

1. A cleaning device of an ice maker, the cleaning device comprising:
   1.1. an ice making container having one or more ice making spaces formed to receive water to make ice;
   1.2. an ejector installed at an upper portion of the ice making container, having at least one ejector pin, and drawing up ice to release ice; and
   1.3. a cleaning block detachably coupled to the ejector and cleaning the ice making spaces of the ice making container.

2. The cleaning device of claim 1, wherein the cleaning block includes a fixed unit detachably coupled to the ejector and a cleaning unit coupled to the fixed unit to wipe out the ice making space of the ice making container.

3. The cleaning device of claim 2, wherein the fixed unit includes pin insertion recesses formed to correspond to the ejector pins to allow the ejector pins to be insertedly coupled thereto.

4. The cleaning device of claim 2, wherein the fixed unit is made of a material having a relatively greater strength than that of the cleaning unit.

5. The cleaning device of claim 2, wherein a single fixed unit is provided and a plurality of cleaning units are provided, and the plurality of cleaning units are coupled to the single fixed unit.

6. The cleaning device of claim 2, wherein the fixed units and the cleaning unit are formed as a single piece, respectively, by the number corresponding to the ice making spaces.

7. The cleaning device of claim 1, wherein the ejector is coupled to a rotational motor which makes a forward and reverse rotation, and in the cleaning mode, the rotational motor is rotated in both directions within a certain angle to perform cleaning.

8. A cleaning method of an ice maker, the method comprising:
   8.1. a cleaning preparation step of rotating an ejector configured to draw up ice from an ice making container such that the ejector is positioned to allow a cleaning block for cleaning the ice making container to be easily inserted thereto;
   8.2. a cleaning step of rotating the ejector to allow the cleaning block to clean the ice making container; and
   8.3. a cleaning separation step of rotating the ejector such that the ejector is positioned to allow the cleaning block to be easily separated from the ejector.

9. The cleaning method of claim 8, wherein an ice making operation is stopped before performing the cleaning preparation step.

10. The cleaning method of claim 9, further comprising: determining whether or not ice remains in the ice making container before the ejector is positioned at an angle at which the cleaning block is easily inserted.

11. The cleaning method of claim 10, further comprising: when it is determined that ice remains in the ice making container in the determining of whether or not ice remains in the ice making container, rotating the ejector to remove the remaining ice.

12. The cleaning method of claim 8, further comprising: determining whether or not the cleaning block remains in the ice making container after the ejector is positioned at an angle at which the cleaning block is easily separated.

13. The cleaning method of claim 12, further comprising: when it is determined that the cleaning block remains in the determining of whether or not the cleaning block remains, further rotating the ejector in a separation direction to secure a withdrawal space.

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