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(54)

Refrigeration appliance

(57)

The present invention provides a refrigeration appliance (100), comprising: a heat insulation cabinet (10) comprising a top wall (11) and side walls (12), wherein the top wall (11) and the side walls (12) each are provided with a heat insulation layer in an interior thereof; a storage chamber (20) formed within said heat insulation cabinet (10); an ice maker (30) disposed in said storage chamber (20); a water nozzle (40) comprising a water supply pipe (41) for supplying said ice maker (30) with

water; wherein said water supply pipe (41) is detachably fitted on the heat insulation cabinet (10) and has a pipe body portion disposed over said ice maker (30) and extending in a vertical direction. Such a arrangement can avoid water remain inside the water supply pipe, thereby eliminate a need of additionally providing a heater to heat water remaining inside the water supply pipe to avoid blockage and in turn reduce design and manufacture cost and energy consumption of the refrigeration appliance.

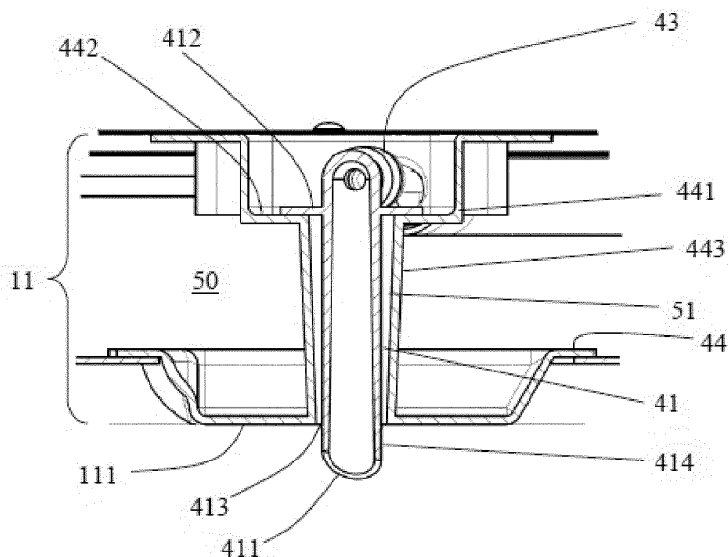


Fig. 2

Description

Technical Field

[0001] The present invention relates to technical field of a household appliance, more specifically to a water nozzle of a refrigeration appliance for supplying an ice maker of the refrigeration appliance with water.

Background Art

[0002] With improvement of people's living level as well as development of commercial space and hotel and restaurant, consumption for various ice cubes is gradually increasing. Therefore, there is an increasing need for an ice maker or a refrigerator capable of making ice.

[0003] As is well known, an ice maker or ice making module is generally disposed in a freezing chamber of a refrigeration appliance to freeze water into ice for a user. The water to be frozen into ice is generally conveyed into the ice maker disposed inside the freezing chamber from the outside (for example a tap or other water storage containers) by a specific water nozzle. Chinese patent publication CN 201340154Y discloses a known water nozzle, wherein a water supply pipe slantways extends into the freezing chamber and ends above an ice maker to supply water required for making ice.

[0004] Generally, a heater is provided around a water supply pipe to heat water remaining inside the water supply pipe upon rapid temperature reduction, in order that blockage of the water supply pipe caused by freezing of the water is avoided. However, it is obvious that such an arrangement undoubtedly leads to increment of design and manufacture cost and energy consumption of a refrigerator.

[0005] In view of this, there is a need of improving an ice making assembly for supplying an ice maker with water in the known refrigeration appliance to overcome the above disadvantages.

Content of the Invention

[0006] It is an object of the present invention to propose a refrigeration appliance having an improved water nozzle, which can avoid water remain inside a water supply pipe, thereby eliminate a need of additionally providing a heater to heat water remaining inside the water supply pipe to avoid blockage and in turn reduce design and manufacture cost and energy consumption of the refrigeration appliance.

[0007] For achieving the above object, the present invention provides a refrigeration appliance, comprising:

a heat insulation cabinet comprising a top wall and side walls, wherein the top wall and the side walls each are provided with a heat insulation layer in an interior thereof;
a storage chamber formed within said heat insulation

cabinet;

an ice maker disposed in said storage chamber;
a water nozzle comprising a water supply pipe for supplying said ice maker with water; wherein said water supply pipe is detachably fitted on the heat insulation cabinet and has a pipe body portion disposed over said ice maker and extending in a vertical direction.

[0008] As a further improvement of the present invention, the refrigeration appliance further comprises a water inlet pipe connected detachably with said water nozzle.

[0009] As a further improvement of the present invention, a ratio of an inner diameter of said water supply pipe to an inner diameter of said water inlet pipe is higher than or equal to 2, preferably in a range of 2-3.

[0010] As a further improvement of the present invention, said water inlet pipe is disposed perpendicularly to said water supply pipe, and a connection of said water inlet pipe to the water supply pipe is disposed within the heat insulation layer of the top wall of the heat insulation cabinet.

[0011] As a further improvement of the present invention, a slope is formed at a pipe opening of a lower end of said water supply pipe.

[0012] As a further improvement of the present invention, said slope and a horizontal plane defines an angle therebetween, which is between 20° and 60°, preferably between 35° and 40°.

[0013] As a further improvement of the present invention, the refrigeration appliance further comprises a fitting box which has a box body portion for receiving the connection of the water supply pipe to the water inlet pipe.

[0014] As a further improvement of the present invention, the pipe body portion of said water supply pipe comprises a first radially extending flange disposed adjacent to an upper end thereof, which first flange is located within said box body portion and abuts against an inner wall surface of the box body portion.

[0015] As a further improvement of the present invention, the pipe body portion of said water supply pipe further comprises a second radially extending flange disposed adjacent to a lower end thereof; and the refrigeration appliance further comprises a sponge covering said pipe body portion and located between said first flange and the second flange.

[0016] As a further improvement of the present invention, said fitting box further comprises a receiving passage communicating the box body portion with said storage chamber, within which receiving passage the pipe body portion of said water supply pipe is partially received.

[0017] As a further improvement of the present invention, a portion of said water inlet pipe outside the fitting box is covered with a protection pipe.

[0018] The present invention has beneficial effects as follows: the vertical arrangement of the water supply pipe can effectively avoid water remain inside the water supply

pipe, thereby preventing blockage of the pipe opening due to freezing of the remaining water within the water supply pipe in the case of rapid freezing, and making it unnecessary to provide a heater so that design and manufacture cost is reduced and energy consumption is saved. In addition, as a result of detachably disposing the water supply pipe, future repair and maintenance thereof is convenient

Description of the Drawings

[0019] The drawings is used to provide further understanding of the present invention, and together with respective embodiments of the present invention to explain the present invention, but not to limit the present invention. In the drawings:

Fig. 1 is a schematic cross sectional view of a refrigeration appliance according to one specific embodiment of the present invention;

Fig. 2 is an enlarged partial view of a water supply assembly of the refrigeration appliance shown in Fig. 1;

Fig. 3 is a schematic perspective view after a water inlet pipe and a water supply pipe in the water supply assembly shown in Fig. 2 have been assembled together;

Fig. 4 is a schematic front cross sectional view after the water inlet pipe and the water supply pipe shown in Fig. 3 have been assembled together;

Fig. 5 is a side view after the water inlet pipe and the water supply pipe shown in Fig. 3 have been assembled together;

Fig. 6 is a top view after the water inlet pipe and the water supply pipe shown in Fig. 3 have been assembled together.

Detailed Description of the Invention

[0020] The present invention will be described in detail below in conjunction with respective embodiments shown in the drawings. However, these embodiments is not intended to limit the present invention, but all of various changes and substitutes of structures or functions made by a person skilled in the art according to these embodiments fall within a protection scope of the present invention.

[0021] In an embodiment shown in Fig. 1, a refrigeration appliance 100 comprises a heat insulation cabinet 10 and a door body 60, wherein the heat insulation cabinet 10 is provided with a heat insulation layer 50 at peripheral sides walls thereof, and the heat insulation layer 50 is formed by injecting foaming material between an

outer shell and an inner container of the heat insulation cabinet 10 and then cooling the foaming material to solidify. A plurality of storage chambers 20 are formed inside the heat insulation cabinet 10 and are separated by separation plates (not shown). The storage chamber 20 may be a refrigerating chamber or a freezing chamber. The door body 60 and the heat insulation cabinet 10 cooperate with each other to selectively open or close the storage chamber 20. In the embodiment, the storage chamber 20 is a freezing chamber.

[0022] The refrigeration appliance 100 also comprises an ice maker 30 disposed within the heat insulation cabinet 10. The ice maker 30 is generally disposed within the freezing chamber, as the freezing chamber can provide low temperature sufficient to maintain made ice cube.

[0023] The ice maker 30 is generally fitted on a top of the freezing chamber 20 and connected with a compressor (not shown) and a condenser (not shown) by a freezing pipe (not shown). The compressor compresses a refrigerant and the compressed refrigerant flows in the freezing pipe after it is condensed by the condenser, to freeze liquid water in the ice maker 30 into the ice cube; then the ice cube is broken off from an ice making tray 301 by an ice removal device (not shown) and falls into a ice storage container (not shown) below the ice maker 30, thereby the ice cube can be finally transferred into a dispensation system (not shown) located in the door body 60 by an ice dispensation passage (not shown).

[0024] Referring to Fig. 2-Fig. 6, in the present embodiment, a water supply assembly is used to supply water into the ice maker 30 to make the ice cube and comprises a water nozzle 40 and a water inlet pipe 42. The water nozzle 40 comprises a water supply pipe 41 used for supplying the ice maker 30 with water, and the water supply pipe 41 is detachably connected with the water inlet pipe 42. Herein, the water inlet pipe 42 may be provided in an interior of the heat insulation cabinet 10 and a protection pipe 422 is provided around an outer side of the water inlet pipe 42. The protection pipe 422 is pre-disposed within the heat insulation layer of the heat insulation cabinet 10, and then is fixed in the heat insulation layer 50 by injecting a foaming material and cooling the foaming material to solidify. Then, the water inlet pipe 42 can be extended into and placed within the protection pipe 422, and can be easily withdrew to maintain and replace it upon damage.

[0025] The protection pipe 422 and the water inlet pipe 42 can extend in a side wall 12 of the heat insulation cabinet 10 and into a top wall 11 of the heat insulation cabinet 10, in order that the water inlet pipe 42 can be connected with the water supply pipe 41. Referring to Fig. 2, in the present embodiment, the water supply pipe 41 extends along a vertical direction of the heat insulation cabinet 10 and is disposed over the ice maker 30, wherein a ratio of an inner diameter of the water supply pipe 41 to an inner diameter of the water inlet pipe 42 is higher than or equal to 2, preferably in a range of 2-3.

[0026] In the present embodiment, there is also a fitting box 44 disposed in an interior of the top wall 11 of the heat insulation cabinet 10. The fitting box 44 is fixedly fitted within the insulation layer 50 of the top wall 11 of the heat insulation cabinet, and comprises a box body portion 441 for receiving a connection (which is a pipe connector 43 in the present embodiment) between the water supply pipe 41 and the water inlet pipe 42 and a receiving passage 443 extending out vertically down from the box body portion 441. Therein, the receiving passage 443 can receive a partial pipe section of the water supply pipe 41. A space required for fitting the fitting box 44 is preformed within the heat insulation layer 50 of the top wall 11 of the heat insulation cabinet. The fitting box 44 can be embedded within said space and further fixed by a fastener such as a screw (not shown).

[0027] A side wall of the box body portion 441 of the fitting box 44 is provided with a through hole, through which the water inlet pipe 42 can pass to be connected with the water supply pipe 41, and a portion of the water inlet pipe 42 outside the box body portion 441 is covered by the protection pipe 422. A bottom wall 442 of the box body portion 441 is provided with an opening in communication with the receiving passage 443, and the water supply pipe 41 can pass through the opening to enter the receiving passage 443. The receiving passage 443 extends down through the heat insulation layer 50 of the top wall 11 from the opening on the bottom wall 442 of the box body portion 441, and communicates with the freezing chamber 20 receiving the ice maker 30.

[0028] Further referring to Fig. 3-Fig. 6, the water supply pipe 41 has a pipe body portion extending longitudinally and the pipe connector 43 perpendicular to the pipe body portion. The pipe connector 43 in its interior is provided with a latch structure 431 which allows the pipe connector 43 to be connected to and released from the water inlet pipe 42 quickly. The pipe body portion comprises a first radially extending flange 412 disposed adjacent to an upper end thereof and a second flange 413 disposed adjacent to a lower end thereof. In the present embodiment, the first flange 412 is circular and has an outer diameter greater than the opening on the bottom wall 442 of the fitting box 44. In the present embodiment, the second flange 413 is likewise circular and has an inner diameter equal to or slightly less than an inner diameter of a lower end of the receiving passage 443.

[0029] In assembly, an exterior of a pipe section, between the first flange 412 and the second flange 413, of the pipe body portion of the water supply pipe 41 is pre-wrapped with a sponge 51, and then the pipe body portion is caused to pass through the receiving passage 443 such that an end portion 414 of the water supply pipe 41 below the second flange 413 extends out into the freezing chamber 20 and is located above the ice maker 30. The first flange 412 covers the opening on the bottom wall 442 of the fitting box 44 and abuts against the bottom wall 442. The second flange 413 is substantially flush with the lower end of the receiving passage 442. The

sponge 51 between the first flange 412 and the second flange 413 fills a gap defined between the pipe body portion of the water supply pipe 41 and the receiving passage 443. Such an arrangement can effectively avoid energy waste caused by a cold air leakage from the freezing chamber 20 receiving the ice maker 30 through the receiving passage 443.

[0030] Referring to Fig. 4, in the present embodiment, a slope 411 is formed at the end portion 414 of the water supply pipe 41, which slope 411 and a horizontal plane defines an angle α of 20°-60°, preferably 35°-40° therebetween. Such a structure allows each water drop to drop from a tip end of a pipe opening without remaining at an edge of the pipe opening.

[0031] By vertically disposing the pipe body portion of the water supply pipe, water remain within the water supply pipe can be effectively avoided, thereby preventing blockage of the pipe opening due to freezing of the remaining water within the water supply pipe in the case of rapid freezing, and making it unnecessary to provide a heater so that design and manufacture cost is reduced and energy consumption is saved. In addition, as a result of detachably disposing the water supply pipe, future repair and maintenance thereof is convenient. Furthermore, water remain within the water supply pipe is further avoided as the inner diameter of the water supply pipe abruptly increases compared with the inner diameter of the water inlet pipe and the pipe opening at a lower end of the water supply pipe is embodied as a slope.

[0032] It is obvious to a skilled person in the art that the present invention is not limited to details of the above exemplary embodiments and can be embodied in other specific forms without departing from the spirit or essential features of the present invention. Therefore, from any one point of view, it should be considered that the above embodiments are exemplary and not non-limiting. The scope of the present invention is defined by the appending claims rather than by the above description, thereby all changes falling within the meanings and the scopes of equivalents of the claims are included within the present invention. Any numeral reference in the claims shall not be considered to limit the related claims.

[0033] In addition, while the description has been described based on the embodiments, it should be understood that each embodiment does not include only one independent technical solution and this description mode of the present invention is used only for clarity. Therefore, a skilled person in the art should regard the description as a whole and the technical solutions in the respective embodiments can be combined with each other in an appropriate manner to obtain other embodiments that can be understood by a skilled person in the art.

Claims

1. A refrigeration appliance (100), comprising:

- a heat insulation cabinet (10) comprising a top wall (11) and side walls (12), wherein the top wall (11) and the side walls (12) each are provided with a heat insulation layer in an interior thereof;
- a storage chamber (20) formed within said heat insulation cabinet (10);
- an ice maker (30) disposed in said storage chamber (20);
- a water nozzle (40) comprising a water supply pipe (41) for supplying said ice maker (30) with water;
- characterized in that**
- said water supply pipe (41) is detachably fitted on the heat insulation cabinet (10) and has a pipe body portion disposed over said ice maker (30) and extending in a vertical direction.
2. The refrigeration appliance (100) according to claim 1, **characterized in that** the refrigeration appliance further comprises a water inlet pipe (42) connected detachably with said water nozzle (40).
 3. The refrigeration appliance (100) according to claim 2, **characterized in that** a ratio of an inner diameter of said water supply pipe (41) to an inner diameter of said water inlet pipe (42) is higher than or equal to 2, preferably in a range of 2-3.
 4. The refrigeration appliance (100) according to claim 2, **characterized in that** said water inlet pipe (42) is disposed perpendicularly to said water supply pipe (41), and a connection of said water inlet pipe (42) to the water supply pipe is disposed within the heat insulation layer (50) of the top wall (11) of the heat insulation cabinet.
 5. The refrigeration appliance (100) according to claim 1, **characterized in that** a slope (411) is formed at a pipe opening of a lower end of said water supply pipe (41).
 6. The refrigeration appliance (100) according to claim 5, **characterized in that** said slope (411) and a horizontal plane defines an angle (α) therebetween, which is between 20° and 60°, preferably between 35° and 40°.
 7. The refrigeration appliance (100) according to claim 2, **characterized in that** the refrigeration appliance further comprises a fitting box (44) which has a box body portion (441) for receiving the connection of the water supply pipe (41) to the water inlet pipe (42).
 8. The refrigeration appliance (100) according to claim 7, **characterized in that** the pipe body portion of said water supply pipe comprises a first radially extending flange (412) disposed adjacent to an upper end thereof, which first flange (412) is located within said box body portion (441) and abuts against an inner wall surface (442) of the box body portion.
 9. The refrigeration appliance (100) according to claim 8, **characterized in that** the pipe body portion of said water supply pipe further comprises a second radially extending flange (413) disposed adjacent to a lower end thereof; and the refrigeration appliance further comprises a sponge (51) covering said pipe body portion and located between said first flange (412) and the second flange (413).
 10. The refrigeration appliance (100) according to claim 7, **characterized in that** said fitting box (44) further comprises a receiving passage (443) communicating the box body portion (441) with said storage chamber, within which receiving passage (443) the pipe body portion of said water supply pipe is partially received.
 11. The refrigeration appliance (100) according to claim 7, **characterized in that** a portion of said water inlet pipe (42) outside the fitting box is covered with a protection pipe (422).

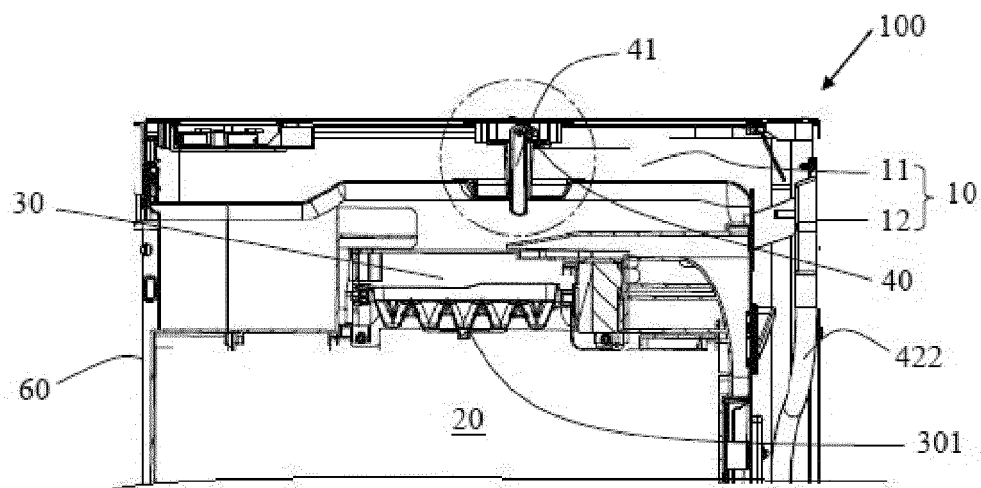


Fig. 1

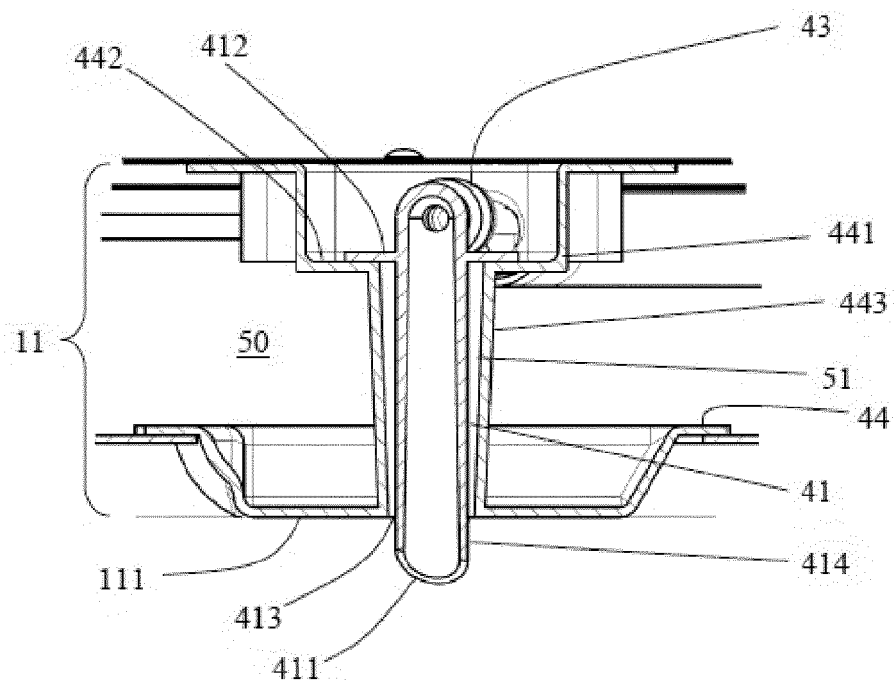


Fig. 2

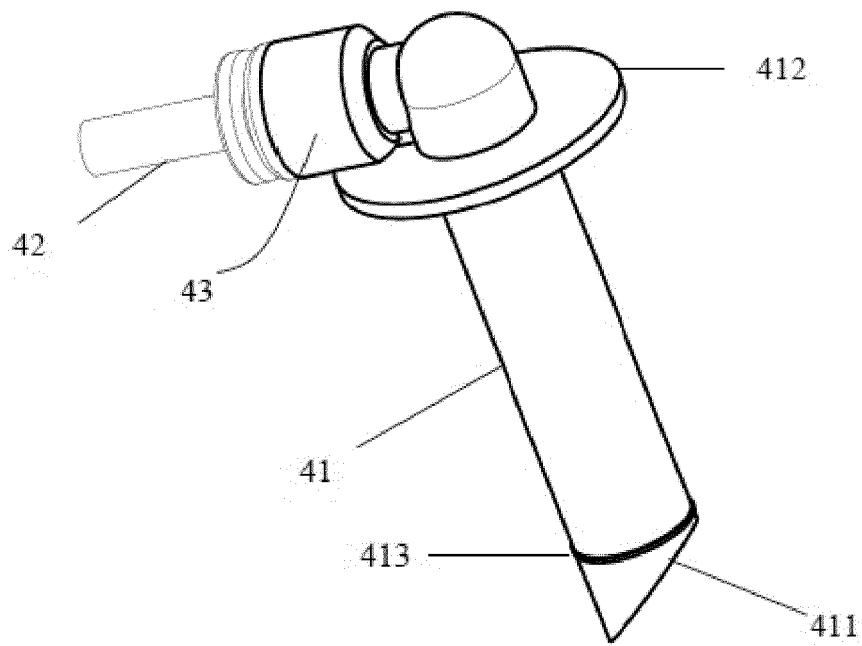


Fig. 3

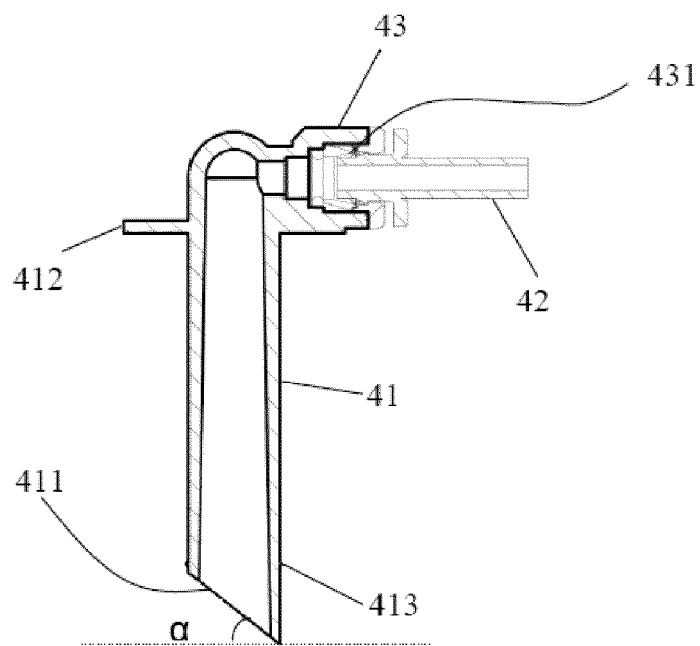


Fig. 4

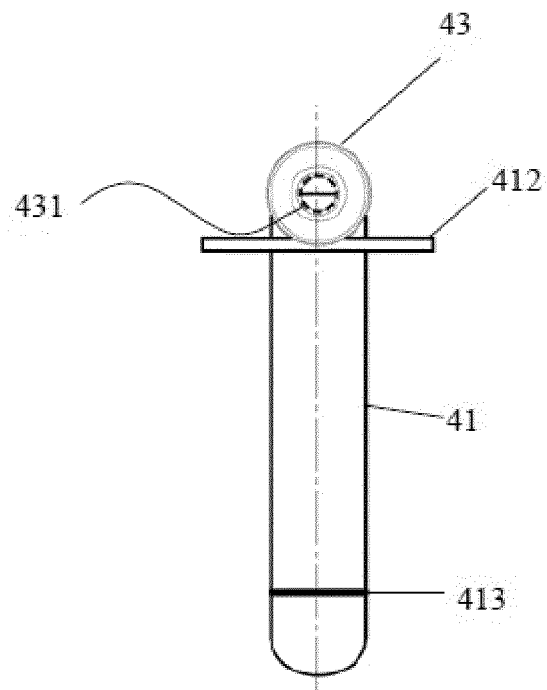


Fig. 5

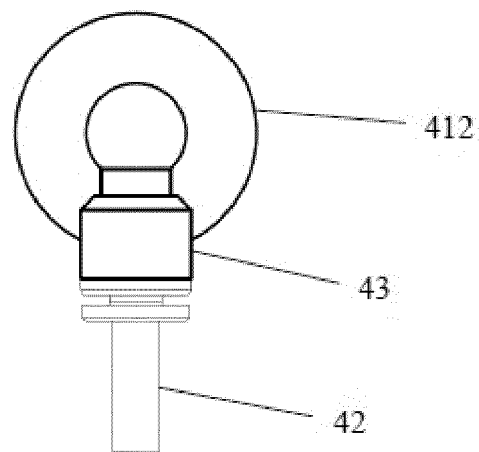


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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