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(54) AUTOMATIC WATER SUPPLY APPARATUS AND REFRIGERATOR HAVING SAME

(57) The present invention discloses an automatic water supply device and a refrigerator having the same. The automatic water supply device comprises a water vessel(100), a bracket(200) for placing the water vessel(100), detection means(300), and a water supply mechanism(400) for supplying water to the water vessel(100), the water vessel(100) comprising a water filling port(110); the detection means(300) comprises a switch movably connected to the bracket(200) and a sensing unit(320) fitted with the switch; the water supply mechanism(400) comprises a water supply pipe(410) and a water valve provided on the water supply pipe(410), and an outlet(110) of the water supply pipe(410) corresponds to the water filling port(110) of the water vessel(100); the automatic water supply device further comprises a controller, the sensing unit(320) switches between an ON state and an OFF state based on the movement of the switch, and the water vessel(100) is placed on the bracket(200) to touch the switch, thereby driving the sensing unit(320) to be in the ON state; the sensing unit(320) outputs a detection signal characterizing the liquid level in the water vessel(100) in the ON state, the controller controlling the water valve to open or close according to the detection signal.

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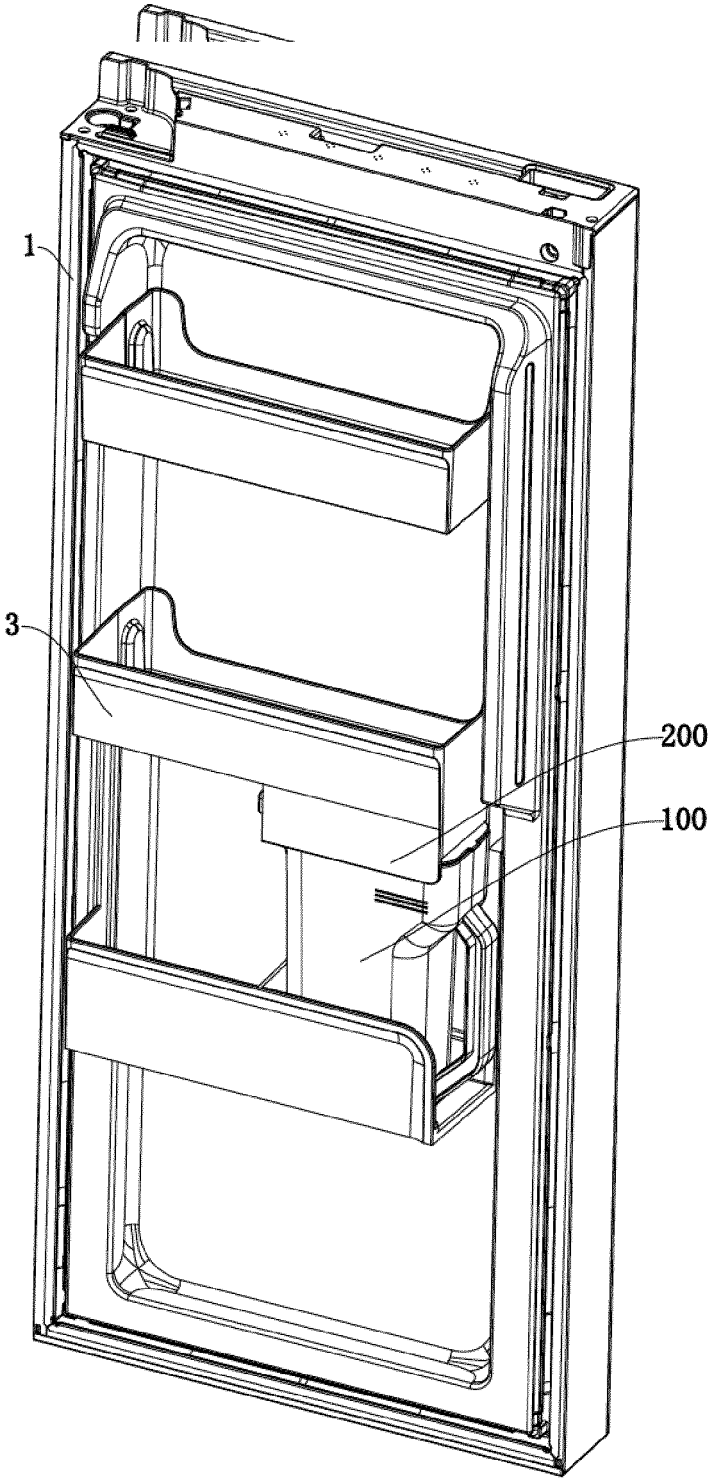
FIG. 1



Description

TECHNICAL FIELD

[0001] The present invention relates to the field of a water supply device, and particularly to an automatic water supply device and a refrigerator having the same.

BACKGROUND

[0002] At present, many refrigerators may provide refrigerated drinking water. Generally, there are two water supply manners: one is providing a dispenser on a surface of the refrigerator so that the user may use a cup to receive water from the dispenser; the other is filling water into a water vessel, then placing the water vessel into the refrigerator, and then taking the water vessel out of the refrigerator after a period of time to drink cold water. In the second solution, to facilitate the user to take a sufficient amount of cold water at any time, some automatic water-filling devices are available from the market, to detect whether the water vessel is placed on a bracket, and detect whether a liquid level in the water vessel is low, and water is automatically filled when the water vessel is placed on the bracket and the liquid level is low.

[0003] However, these automatic water-filling devices are structurally complicated and need to use a plurality of sensors to respectively detect whether the water vessel is placed on the bracket and whether the liquid level in the water vessel is low, so that the costs are high, and the structures are complicated.

SUMMARY

[0004] An object of the present invention is to provide an automatic water supply device and a refrigerator having the same.

[0005] As compared with the prior art, in the automatic water supply device and the refrigerator having the same according to the present invention, the automatic water supply device judges whether the water vessel is placed on the bracket according to the ON state and OFF state of the sensing unit, and then sends the detection signal characterizing the liquid level in the water vessel to the control through the sensing unit in the ON state. One sensing unit may be used to simultaneously detect whether the water vessel is placed on the bracket as well as the liquid level in the water vessel, thereby controlling the water valve to open when the water vessel is placed on the bracket and the liquid level is low, to automatically fill water into the water vessel, so that the user may take the cold water conveniently at any time.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006]

FIG. 1 is a structure schematic view of a door body of a refrigerator according to an embodiment of the present invention;

FIG. 2 is a structural schematic view of an automatic water supply device according to a first embodiment of the present invention;

FIG. 3 is a structural schematic view of an automatic water supply device according to a first embodiment of the present invention;

FIG. 4 is an enlarged view of portion A in FIG. 3;

FIG. 5 is a structural schematic view of a water vessel according to a first embodiment of the present invention;

FIG. 6 is a cross-sectional view of a water vessel according to a first embodiment of the present invention;

FIG. 7 is a structural schematic view of an automatic water supply device according to a second embodiment of the present invention;

FIG. 8 is a cross-sectional view of the automatic water supply device according to the second embodiment of the present invention;

FIG. 9 is an enlarged view of portion B in FIG. 8;

FIG. 10 is a cross-sectional view of a water vessel according to the second embodiment of the present invention.

DETAILED DESCRIPTION

[0007] As shown in FIG. 1, the present invention discloses a refrigerator. The refrigerator comprises a cabinet and a door body 1 for opening and closing the cabinet, an automatic water supply device 2 being provided on an inner side of the door body 1.

[0008] FIGS. 2-6 show an automatic water supply device according to a first embodiment of the present disclosure. The automatic water supply device 2 comprises a water vessel 100, a bracket 200 for placing the water vessel 100, detection means 300, and a water supply mechanism 400 for supplying water to the water vessel 100. The cabinet may define a refrigerating chamber. When the door body 1 closes the cabinet, the cold air in the refrigerating chamber may cool the water in the water vessel 100.

[0009] Certainly, sites where the automatic water supply device is used are not limited to refrigerators, and may be various sites such as other refrigeration appliances or cafes. In embodiments of the present invention, water is a collective term of liquid beverages, and includes but not limited to liquid beverages such as purified water, fruit juice, milk or coffee.

[0010] As shown in FIGS. 2-3, the water vessel 100 comprises a water filling port 110. The detection means 300 comprises a switch movably connected to the bracket 200 and a sensing unit 320 fitted with the switch. The switch is disposed on the bracket 200 at a position corresponding to a side wall of the water vessel 100. The water supply mechanism 400 comprises a water supply pipe 410 and a water valve provided on the water supply

pipe 410. An outlet of the water supply pipe 410 corresponds to the water filling port 110 of the water vessel 100. The automatic water supply device further comprises a controller. The sensing unit 320 switches between an ON state and an OFF state based on the movement of the switch. The water vessel 100 is placed on the bracket 200 to touch the switch, thereby driving the sensing unit 320 to be in the ON state. The sensing 320 sends a detection signal characterizing the liquid level in the water vessel 100 to the controller in the ON state. The controller controls the water valve to open or close according to the detection signal.

[0011] The automatic water supply device disclosed in the present invention judges whether the water vessel 100 is placed on the bracket 200 according to the ON state and OFF state of the sensing unit 320, and then outputs the detection signal characterizing the liquid level in the water vessel 100 through the sensing unit 320 in the ON state. One sensing unit 320 may be used to simultaneously detect whether the water vessel 100 is placed on the bracket 200 as well as the liquid level in the water vessel 100, thereby controlling the water valve to open when the water vessel 100 is placed on the bracket 200 and the liquid level is low, to automatically fill water into the water vessel 100, so that the user may take the cold water conveniently at any time.

[0012] Preferably, the sensing unit may be a capacitive sensor, a photoelectric sensor, a pressure/weight sensor, a Hall sensor or the like, and may also be other sensors as long as they may detect and determine the presence of the liquid in the water vessel and/or the liquid level in the water vessel.

[0013] In the embodiment of the present invention, a height nearby the top of the water vessel 100 is set as a preset liquid level. When the liquid level in the water vessel reaches the preset liquid level, water needn't be further filled and the controller will control the water valve to close; when the liquid level in the water vessel 100 does not reach the preset liquid level, water needs to be filled into the water vessel, and the controller will control the water valve to open.

[0014] Specifically, in the first embodiment of the present invention, the sensing unit 320 comprises a capacitive sensor which is disposed on the bracket 200 at a position corresponding to the side wall of the water vessel 100. The capacitive sensor detects the liquid level in the water vessel 100 in the ON state, and generates the detection signal according to the liquid level. In the embodiment of the present invention, the capacitive sensor is specifically a capacitive liquid level sensor. The capacitive liquid level sensor is a variable medium type capacitor that uses a change of a measured medium surface to cause a capacitance change. Specifically, the switch and the capacitive sensor are disposed on the bracket 300 at a height corresponding to a preset liquid level of the water vessel 100. When the capacitive sensor is in the ON state, if the liquid level in the water vessel 100 does not reach the preset liquid level, and the capacitive sensor only detects air, the controller receives the first detection signal and controls the water valve to open. At this time, water will filled into the water vessel 100; during water filling, the liquid level in the water vessel 100 gradually rises. When the liquid level is higher than the position of the capacitive sensor, the capacitive sensor can detect that the medium changes from air to water. At this time, the capacitance value changes, and the controller will receive the second detection signal and control the water valve to close so that the automatic water filling is completed. The capacitive sensor has a large detection dynamic range, a fast response speed, a simple structure and a low cost.

[0015] In the embodiment of the present invention, the switch comprises a rotating member 311 rotatably connected to the bracket 200, an electrical connection member 312 is provided on the bracket 200, and the capacitive sensor is disposed in the rotating member 311. When the water vessel 100 is placed on the vessel 200, the side wall of the water vessel 100 touches and presses the rotating member 311, so that the rotating member 311 drives the capacitive sensor to rotate. The capacitive sensor contacts the electrical connection member 312 to energize the capacitive sensor, so that whether the water vessel 100 is placed on the bracket 200 may be judged through the ON state and OFF state of the capacitive sensor. Therefore, it is unnecessary to provide an additional sensor, and only the capacitive sensor for detecting the liquid level can be used to detect whether the water vessel is placed on the bracket. In another embodiment, the electrical connection member may be provided on the rotating member, and the capacitive sensor may be fixedly disposed on the bracket.

[0016] In another embodiment, the capacitive sensor may also be disposed on the water vessel, and the electrical connection member is disposed on the bracket. When the water vessel is placed on the bracket, the capacitive sensor may be in contact with the electrical connection member to be in an ON state.

[0017] Specifically, the water supply pipe 410 may be externally connected to the user's water source, and extends along the cabinet of the refrigerator into the door body 1. When the water valve is opened, the external water source may fill the water vessel 100 with water through the water supply pipe 410. Specifically, in the embodiment of the present invention, the water supply pipe extends from a compressor compartment at a lower part of the cabinet along the cabinet into the inner side of the door body, and the water valve may be provided on the water supply pipe in the compressor compartment. Certainly, in other embodiments, the water valve may also be disposed on other parts of the water supply pipe.

[0018] The electrical connection member 312 is an elastic member. When the water vessel 100 is placed on the bracket 200, a side wall of the water vessel 100 presses the rotating member 311, and the capacitive sensor contacts the electrical connection member 312 to make the elastic electrical connection member 312 in a com-

pressed state. When the water vessel 100 is removed from the bracket 200, the electrical connection member 312 may release the elastic force to cause the rotating member 311 to rotate reversely, and the capacitive sensor does not contact the electrical connection member 312 any longer and switches to the OFF state. After the water vessel 100 is taken from the the bracket 200, the elastic electrical connection member 312 enables the rotating member 311 to be automatically elastically driven to rotate, thereby making the capacitive sensor to switch to the ON state and simplifying the ON/OFF state switching of the capacitive sensor. The electrical connection member 312 may preferably be a compression spring. As shown in FIG. 4, three compression springs extend from the bracket 200, and correspond to the three contacts on the sensor, respectively.

[0019] The capacitive sensor comprises at least three contacts. When the rotating member 311 is pressed, the at least three contacts are all in contact with the electrical connection member 312. The at least three contacts include at least two electrical connection contacts and at least one signal connection contact. In the embodiment of the present invention, as shown in FIG. 4, the capacitive sensor comprises three contacts, two of which are electrical connection contacts, and the remaining one is a signal connection contact. Correspondingly, three electrical connection members 312 are provided on the bracket 200. When the rotating member 311 is pressed, the two electrical connection contacts and one signal connection contact of the capacitive sensor are respectively communicated with the corresponding electrical connection members 312, so that the capacitive sensor is in the ON state. After the controller detects that the capacitive sensor is in the ON state, it may determine that the water vessel 100 is already placed on the bracket 200. The signal connection contact is used to send a detection signal characterizing the liquid level in the water vessel 100 to the controller when the capacitive sensor is in the ON state.

[0020] As shown in FIGS. 5-6, the water vessel 100 further comprises a water vessel lid 120, a water vessel body 130, a water storage space defined by the water vessel lid 120 and the water vessel body 130, and the water filling port 110 is disposed on the water vessel lid 120. The water vessel 100 further comprises a water filling cup 140 extending from the water filling port 110 to the bottom of the water vessel 100. A plurality of water outlets 141 communicated with the water storage space are provided on a peripheral wall of the water filling cup 140. The water filling cup 140 may slow down the flow rate of the water upon water filling, reduce the noise upon water filling, and prevent the water flow from splashing around.

[0021] Preferably, the water filling cup 140 comprises an upwardly-protruding bottom wall 142, and the water outlets 141 extend from top to bottom on the peripheral wall to a position connected to the bottom wall 142. Specifically, a plurality of elongated water outlets 141 are provided at an interval on the peripheral wall of the water filling cup 140, and the water outlets 141 extend on the peripheral wall of the water filling cup 140 so that water can flow into the water storage space quickly without gathering in the water filling cup 140. The upward protrusion of the bottom wall 142 may further prevent the water in the water filling cup 140 from gathering and enable the water to flow out through the water outlets 141.

[0022] A water spout 131 is disposed on the water vessel body 130, and a water baffle 150 is provided at a position adjacent to the water spout 131 in the water storage space. A water passageway 151 communicated with the water spout 131 is formed between the water baffle 150 and the inner wall of the water vessel 100. When the user takes water, he may pour out water through the water spout 131. The water baffle 150 is provided to prevent the water from flowing rapidly and splashing out of the water vessel 100 when the user pours water.

[0023] Preferably, the water baffle 150 is preferably arc-shaped. Furthermore, the arc top of the water baffle 150 protrudes toward the side wall of the water vessel 100 opposite to the water spout 131. The arc-shaped water baffle 150 has a good water blocking effect, and its arc top protrudes toward the side wall of the water vessel 100 opposite to the water spout 131, so that an effective water passageway is formed between the water baffle 150 and the side wall of the water vessel 100, and further enhances the splash-preventing effect.

[0024] In the embodiment of the present invention, the water baffle 150 extends from the water vessel lid 120 to the bottom of the water vessel 100, and the water passageway 151 is formed on both sides and the bottom of the water baffle 150. The water baffle 150 extending to the bottom of the water vessel 100 may guide water into the water passageway from a lower position of the water vessel 100, thereby further reducing the flow rate of water when poured.

[0025] As shown in FIG. 1, the door 1 is provided with a bottle seat 3, and the bracket 200 is additionally disposed on the bottle seat 3. The bracket 200 is pre-assembled with the bottle seat 3 through a connecting piece. The connecting piece may be specifically a hook structure to facilitate mounting the bracket 200 to or demounting the bracket 200 from the bottle seat 3. When the user does not need to use the water vessel, he may remove the water vessel 100 and the bracket 200, and the original position where the bracket is placed may continue to be used as the bottle seat. The outlet of the water supply pipe 410 is fixed at an upper half of the bracket 100 to align with the water filling port 110 on the water vessel lid 120 of the water vessel 100. The water vessel 100 is located below the bottle seat 3 and on a side close to the door handle. The water vessel may be drawn out transversely along the width direction of the door body, so it occupies a small space in the refrigerator without affecting the storage space of the shelves in the refrigerating compartment.

[0026] FIGS. 7-10 show an automatic water supply de-

vice according to a second embodiment of the present invention. The second embodiment differs from the first embodiment in that the sensing unit 320" includes a sensor 321' that cooperates with the rotating member 311' and an inductive element 322' that is disposed in the water vessel 100 and rises and falls with the liquid level. The rotating member 311' is disposed on the bracket 200' at a position corresponding to the top of the water vessel 100'. The sensor 321' switches between an ON state and an OFF state based on the movement of the switch, and the rotating member 311' drives the sensor 321' to be in the ON state. The sensor 321' detects the position of the inductive element 322' in the ON state to output a detection signal characterizing the liquid level in the water vessel 100'. The controller controls the opening or closing of the water valve according to the received detection signal of the sensor 321'.

[0027] In the present embodiment, the sensor 321' is disposed in the rotating member 311', and the top of the water vessel 100' is provided with a bump 124'. When the water vessel 100' is placed on the bracket 200', the bump 124' on the top of the water vessel 100' presses the switch to cause the rotating member 311' to drive the sensor 321' to rotate to energize the sensor 321', so that whether the water vessel 100' is placed on the bracket 200' through the ON/OFF state of the sensor 321'. Inside the water vessel 100', an inner box 121' is disposed extending downward from the lid 120', and a peripheral wall of the inner box 121' is provided with a plurality of water holes communicated with the water storage space, so that the water in the water vessel 100' may flow into the inner box 121'. Specifically, a float box 122' is disposed in the inner box 121', and the inductive element 322' is disposed in the float box 122'. Specifically, the inner box 121' is snap-fitted on the water vessel lid 120', and the inner box 121' does not rise or fall with the liquid level, whereas the float box 122' moves up and down inside the inner box 121' as the liquid level changes. With the inner box 121' that does not move along with the liquid level being disposed in the water vessel 100', a movement range and movement direction of the float box 122' can be restricted, and it can be ensured that the magnet can only move within a desired height range and move only in the height direction of the water vessel 100'. The inductive element 322' is fixedly disposed in the float box 122' and moves up and down with the float box 122'. The float box 122' seals the inductive element 322' therein to ensure that the float box can float up and down.

[0028] Specifically, an outer diameter of the float box 122' matches an inner diameter of the inner box 121', so that the float box 122' can only move up and down in the height direction of the inner box 121'. The inner wall of the inner box 121' is further provided with a plurality of guide ribs 1211' which extend from top to bottom and can prevent the float box 122' from getting stuck when it moves up and down. An upper surface of the float box 122' is further provided with a plurality of protrusions 1221', and exhaust holes 123' are provided on the water vessel lid 120' at positions corresponding to the protrusions 1221'. Specifically, after the liquid level in the water vessel 100' rises and the upper surface of the float box 122' contacts the bottom surface of the water vessel lid 120', the float box 122' might not fall down when the liquid level falls due to a siphon effect. With the protrusions 1221' being provided on the upper surface of the float box 122' and the exhaust hole 123' being provided on the water vessel lid 100', a gap is present between the upper surface of the float box 122' and the water vessel lid 100' to avoid occurrence of the siphon effect between the upper surface of the float box 122' and the water vessel lid 100', so that the up-down movement of the float box 122' is smoother.

[0029] In the embodiment of the present invention, the sensor 321' is a Hall switch, and the Hall switch is provided on the bracket 200' at a position corresponding to the top of the water vessel 100'; the inductive element 322' is a magnet. The Hall switch is disposed on the water vessel lid 120', and the approaching of the magnet may be detected. Specifically, the Hall switch is an active electromagnetic conversion device made by an integrated packaging and assembling process based on the principle of the Hall effect. The Hall switch may sense the magnitude of the magnetic flux. When the magnetic flux reaches a preset value, a trigger in the Hall switch flips, and an output level state of the Hall switch is also inverted accordingly, so that the magnetic input signal may be converted into an electrical signal. The magnet in the float box 122' will move up and down with the liquid level, and the magnetic flux detected by the Hall switch will also change accordingly. When the Hall switch is in the ON state, the controller receives the signal and determines that the water vessel 100' has been placed on the bracket 200'. If the liquid level in the water vessel 100' does not reach the preset liquid level, the magnet is far away from the Hall switch and the magnetic flux induced by the Hall switch cannot make the trigger inside the Hall switch flip, and the controller will control the water valve to open and fill the water vessel 100' with water. During the water filling process, the liquid level will rise and drive the float box 122' to move upward, and the magnet will also approach the Hall switch until the magnetic flux induced by the Hall switch also reaches a preset value when the liquid level in the water vessel 100' reaches the preset liquid level. At this time, the trigger inside the Hall switch flips to invert the output level state of the Hall switch, and the controller will control the water valve to close and stop water filling. As such, the Hall switch judges the liquid level in the water vessel 100' by detecting the position of the magnet, and the controller may control the opening and closing of the water valve according to the detection signal sent by the Hall switch, to automatically fill the water vessel 100' with water when needed.

[0030] Other structures such as the cabinet door body and the water supply structure in the second embodiment of the present invention are all the same as those in the first embodiment, and will not be detailed any more here.

[0031] Another embodiment of the present invention further discloses an automatic water supply method. The method comprises the following steps: S1: receiving a signal characterizing that the sensing unit is in an ON state. S2: determining whether a first detection signal characterizing that the liquid level in the water vessel reaches a preset level is received. S3: if YES, turning to step S4; if NO, turning to step S5. S4: controlling the water valve to close. S5: controlling the water valve to open, and meanwhile performing step S3.

[0032] When the water vessel is placed on the bracket, the side wall of the water vessel will press the rotating member to energize the sensing unit to be in the ON state. At this time, the controller will receive the signal indicating that the sensing unit is in the ON state. The sensing unit will detect the liquid level in the water vessel. If the liquid level in the water vessel reaches the preset level, the sensing unit will send the first detection signal to the controller; otherwise, the sensing unit will not send the signal to the controller or sends a second detection signal to the controller. When the controller does not receive the first signal or receives the second detection signal, it will control the water valve to be in an open state, whereupon the water supply pipe will automatically fill the water vessel with water. When the liquid level in the water vessel gradually rises to the preset level, the controller receives the first signal and controls the water valve to close to end the automatic water filling. In this way, one sensor is used to achieve the detection of whether the water vessel 100 is placed on the bracket 200 and the detection of the liquid level in the water vessel 100 at the same time, so that the water vessel 100 may be automatically filled with water, and the user may conveniently take a sufficient amount of cold water at any time.

[0033] The automatic water supply device disclosed in the present invention judges whether the water vessel is placed on the bracket according to the ON state and OFF state of the sensing unit, and then detects the liquid level in the water vessel through the sensing unit in the ON state. One sensing unit may be used to simultaneously detect whether the water vessel is placed on the bracket as well as the liquid level in the water vessel, thereby controlling the water valve to open when the water vessel is placed on the bracket and the liquid level is low, to automatically fill water into the water vessel, so that the user may take the cold water conveniently at any time. The cooperation of the elastic electrical connection member and the rotating member may cause whether the water vessel is placed on the bracket to correspond to the switching between the ON state and OFF state of the sensing unit. The water filling cup disposed in the water vessel may slow down the flow rate of the water upon water filling, reduce the noise upon water filling, and prevent the water flow from splashing around. The upward protrusion of the bottom wall of the water filling cup may further prevent the water in the water filling cup from gathering and enable the water to flow out through the water outlets. The water baffle is provided to prevent the water from flowing rapidly and splashing out of the water vessel when the user pours water.

Claims

1. An automatic water supply device, wherein the device comprises a water vessel, a bracket for placing the water vessel, detection means, and a water supply mechanism for supplying water to the water vessel, the water vessel comprising a water filling port;

   the detection means comprises a switch movably connected to the bracket and a sensing unit fitted with the switch;
   the water supply mechanism comprises a water supply pipe and a water valve provided on the water supply pipe, and an outlet of the water supply pipe corresponds to the water filling port of the water vessel;
   the automatic water supply device further comprises a controller, the sensing unit switches between an ON state and an OFF state based on the movement of the switch, and the water vessel being placed on the bracket to touch the switch, thereby driving the sensing unit to be in the ON state;
   the sensing unit outputs a detection signal characterizing the liquid level in the water vessel in the ON state, the controller controlling the water valve to open or close according to the detection signal.

2. The automatic water supply device according to claim 1, wherein the sensing unit comprises a capacitive sensor which is disposed on the bracket at a position corresponding to the side wall of the water vessel; the capacitive sensor detects the liquid level in the water vessel in the ON state, and generates the detection signal according to the liquid level.

3. The automatic water supply device according to claim 1, wherein the switch comprises a rotating member rotatably connected to the bracket, an electrical connection member is provided on the bracket, and the sensor is provided in the rotating member; when the rotating member is pressed, the sensing unit contacts the electrical connection member.

4. The automatic water supply device according to claim 3, wherein the sensing unit comprises at least three contacts; when the rotating member is pressed, all of the at least three contacts are in contact with the electrical connection member; the at least three contacts comprise at least two electrical connection contacts and at least one signal connection contact.

5. The automatic water supply device according to claim 3, wherein the electrical connection member is an elastic member.

6. The automatic water supply device according to claim 1, wherein the water vessel comprises a water vessel lid, a water vessel body, and a water storage space defined by the water vessel lid and the water vessel body, and the water filling port is disposed on the water vessel lid; the water vessel further comprises a water filling cup extending from the water filling port to the bottom of the water vessel, and a plurality of water outlets communicated with the water storage space are provided on a peripheral wall of the water filling cup.

7. The automatic water supply device according to claim 6, wherein the water filling cup comprises an upwardly-protruding bottom wall, and the water outlets extend from top to bottom on the peripheral wall to a position connected to the bottom wall.

8. The automatic water supply device according to claim 1, wherein the water vessel comprises a water vessel lid, a water vessel body, and a water storage space defined by the water vessel lid and the water vessel body, a water spout is disposed on the water vessel body, a water baffle is provided at a position adjacent to the water spout in the water storage space, and a water passageway communicated with the water spout is formed between the water baffle and the inner wall of the water vessel.

9. The automatic water supply device according to claim 8, wherein the water baffle is arc-shaped.

10. The automatic water supply device according to claim 8, wherein the water baffle extends from the water vessel lid to the bottom of the water vessel, and the water passageway is formed on both sides and the bottom of the water baffle.

11. A refrigerator, wherein the refrigerator comprises a cabinet and a door body for opening and closing the cabinet, the water supply device according to any of claims 1-10 being disposed on an inner side of the door body.

FIG. 1

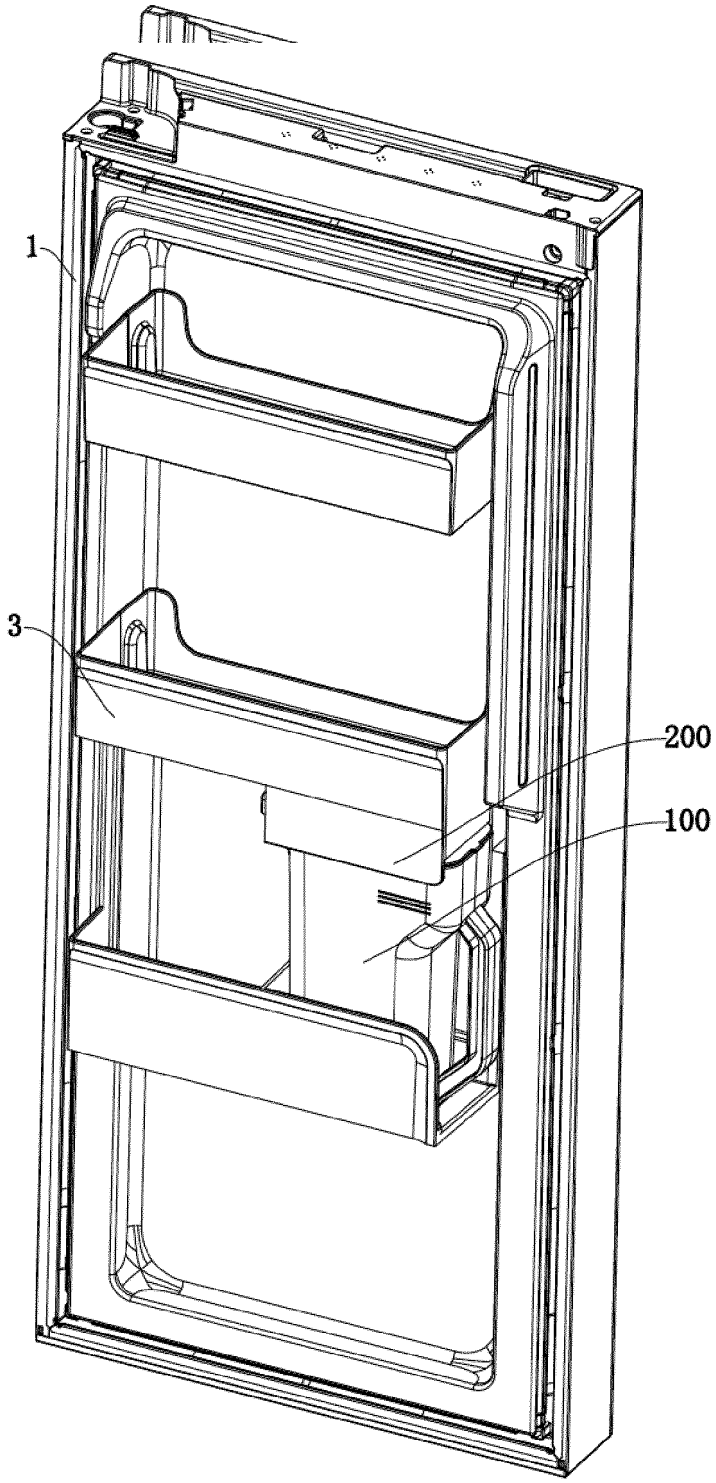


FIG. 2

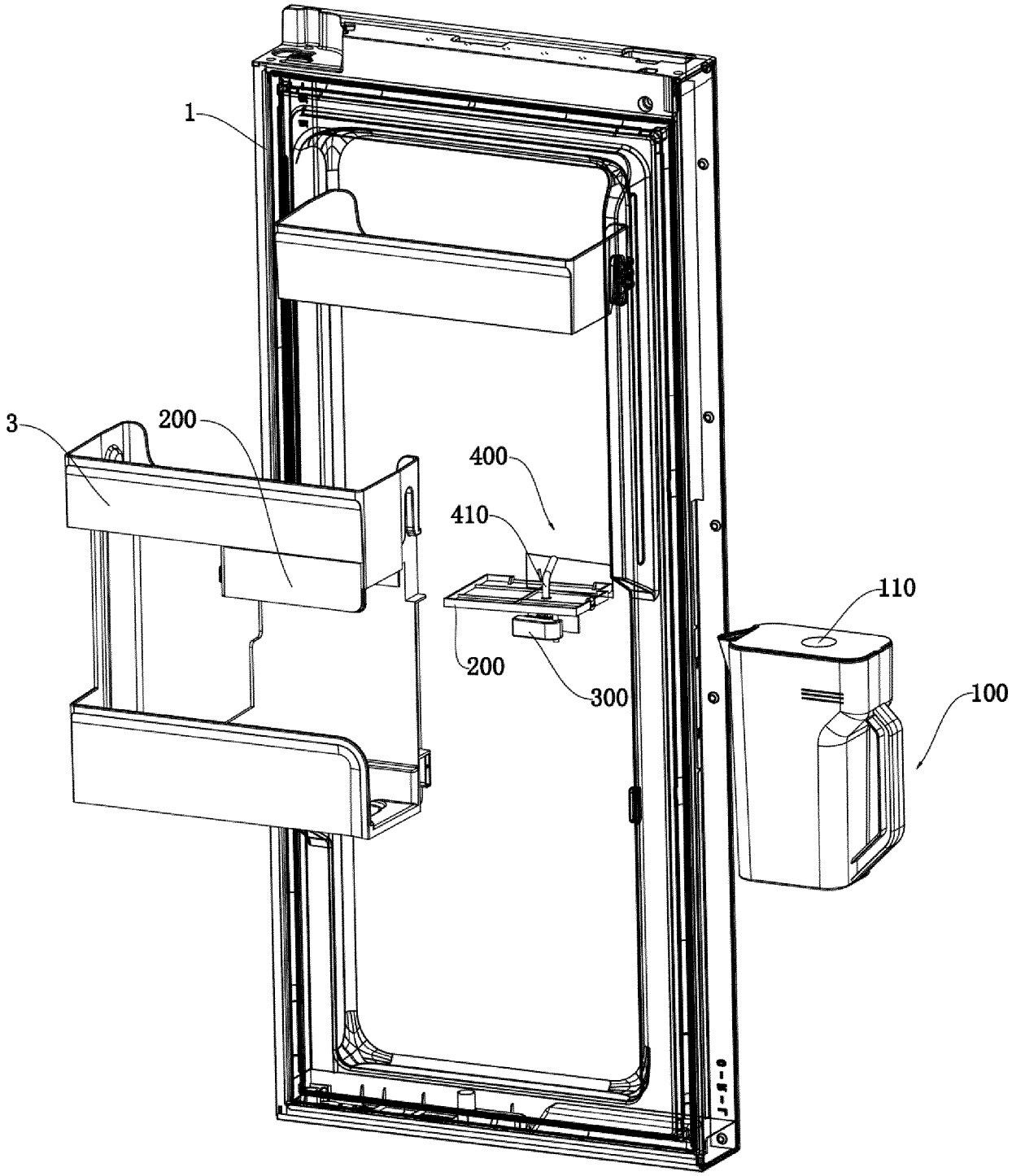


FIG. 3

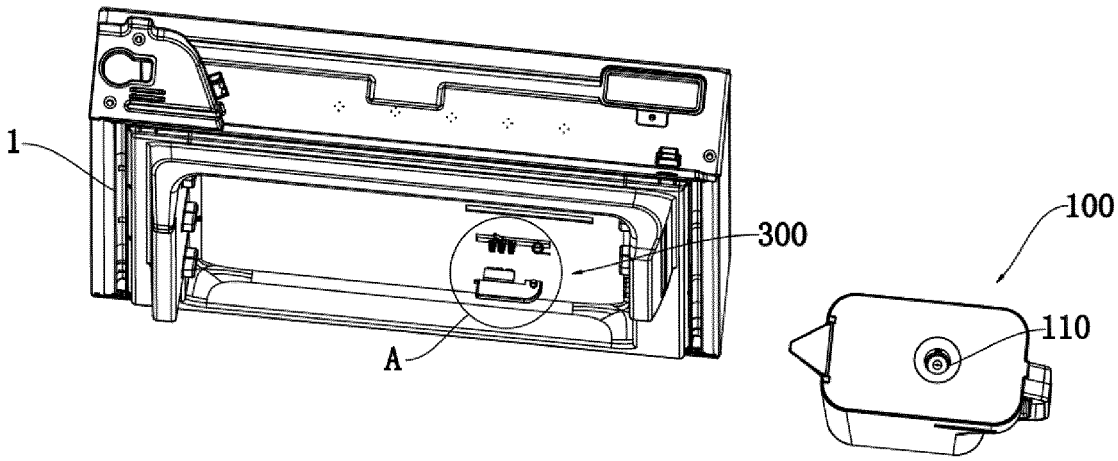


FIG. 4

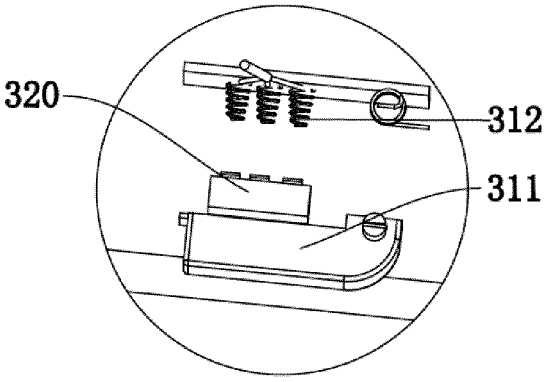


FIG.5

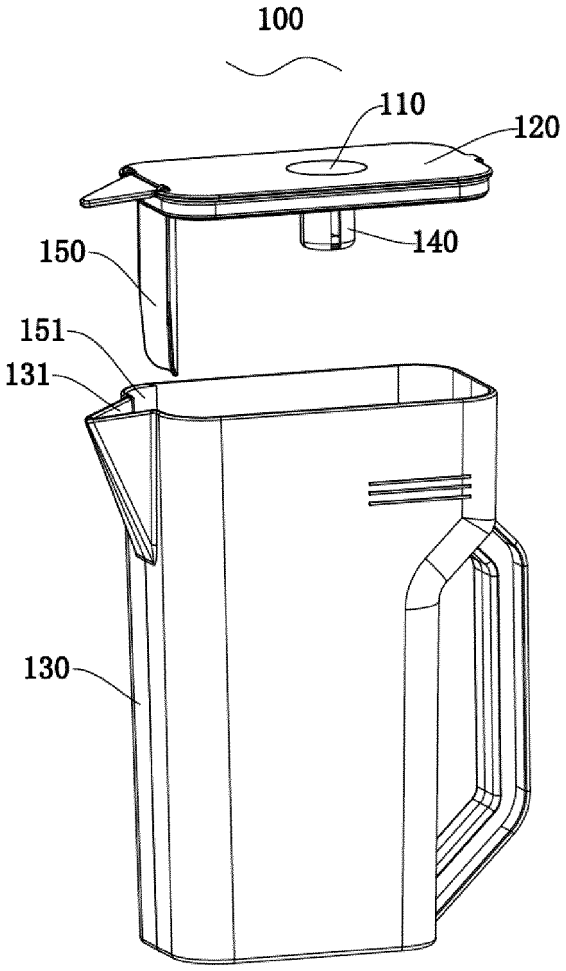


FIG. 6

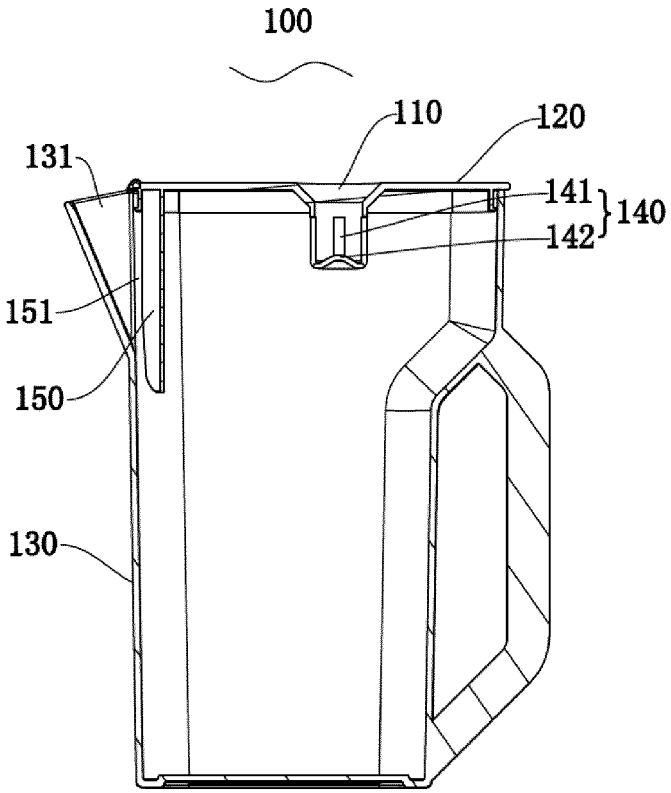


FIG. 7

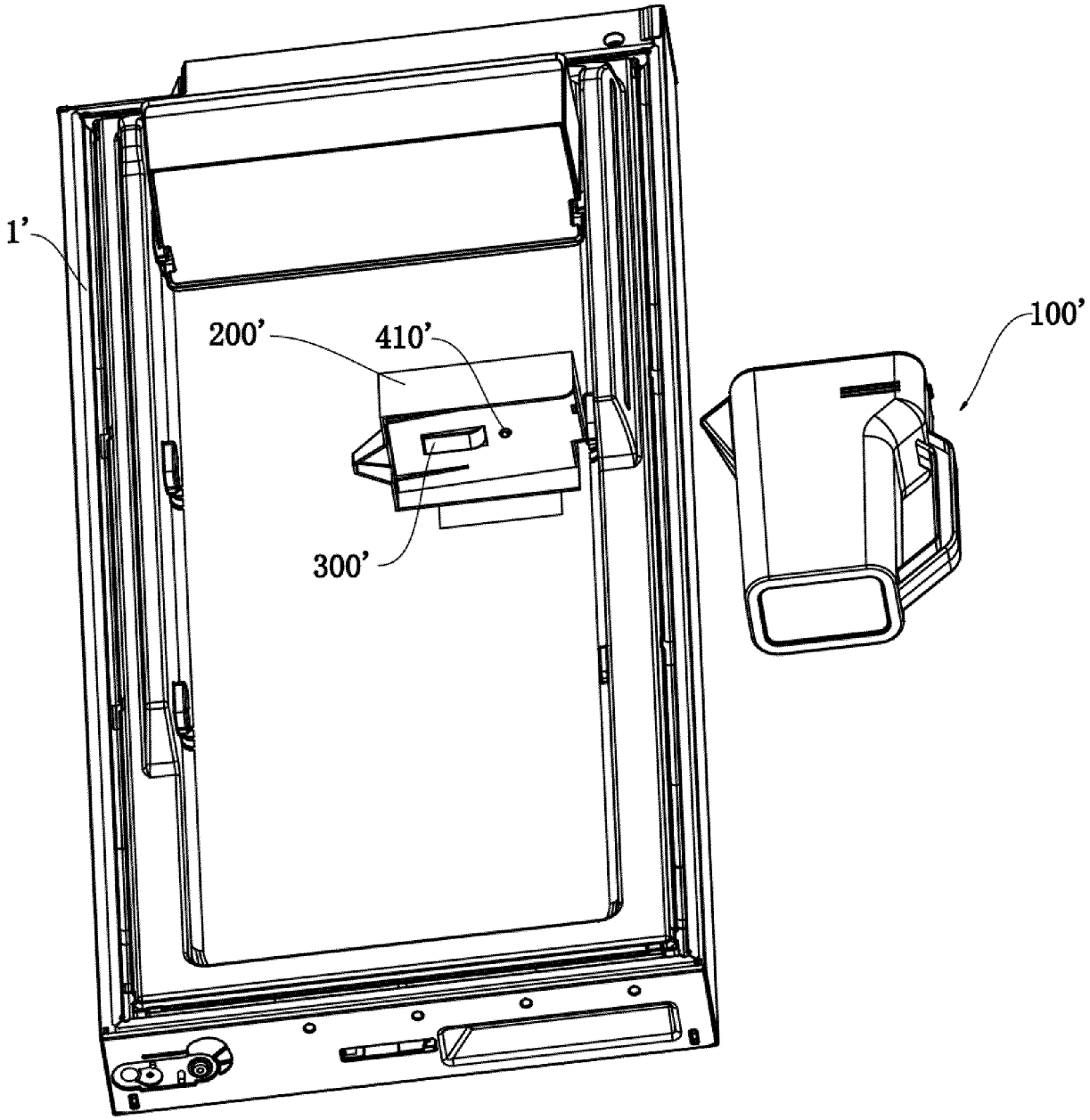


FIG. 8

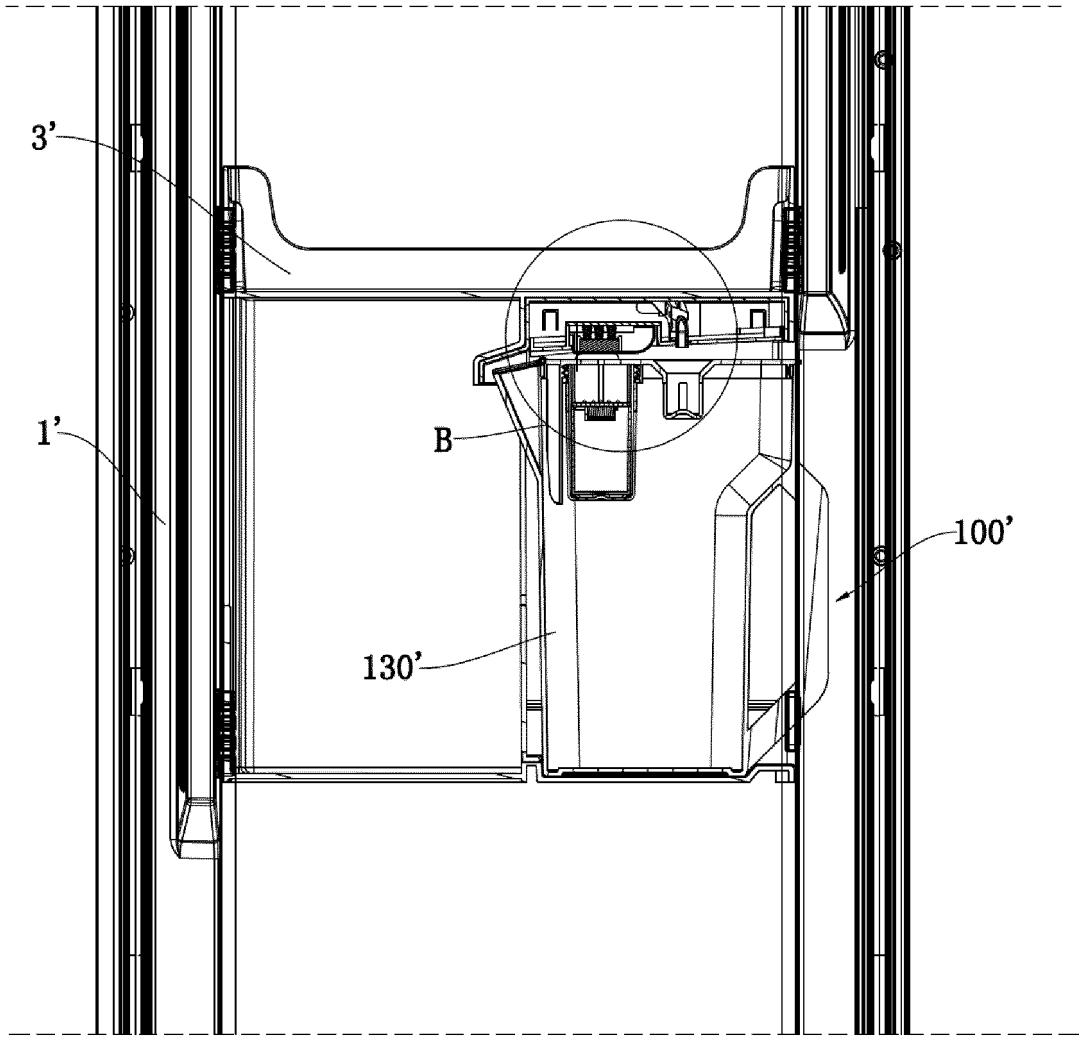


FIG. 9

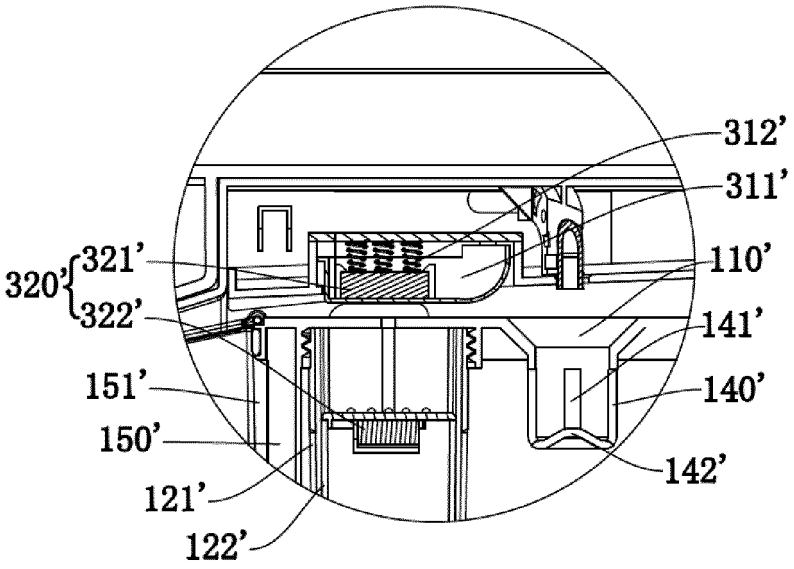
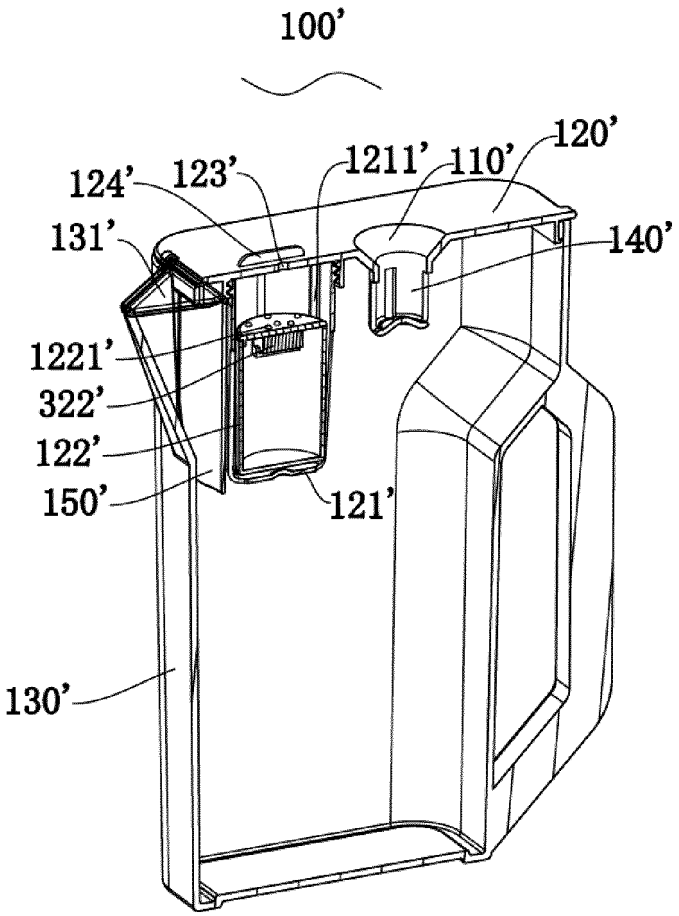


FIG. 10



INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2020/115641

A. CLASSIFICATION OF SUBJECT MATTER

F25D 23/12(2006.01)i; F25D 29/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F25D23/-;F25D29/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS, CNTXT, CNKI, DWPI, SIPOABS, EPTXT, USTXT, WOTXT, 供水, 给水, 饮水, 饮用水, 水壶, 水盒, 水箱, 容器, 检测, 传感, 感应, 开关, 触碰, 接触, 按压, 连通, 断开, 通断, 液位, 水位, 电容, 转动, 触点, water, supply, kettle?, tank?, box?, container?, detect+, sensor?, induct+, switch+, contact+, connect+, cut+, onoff+, level?, capacity+, rotat+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 105806025 A (QINGDAO HAIER CO., LTD.) 27 July 2016 (2016-07-27) description, paragraphs 0024-0047, and figures 1-6	1-11
A	CN 106766657 A (QINGDAO HAIER CO., LTD.) 31 May 2017 (2017-05-31) entire document	1-11
A	CN 107036380 A (HISENSE RONSHEN (GUANGDONG) REFRIGERATORS CO., LTD.) 11 August 2017 (2017-08-11) entire document	1-11
A	CN 208925892 U (FOSHAN SHUNDE MIDEA ELECTRICAL HEATING APPLIANCES MANUFACTURING CO., LTD.) 04 June 2019 (2019-06-04) entire document	1-11
A	CN 102242974 A (LI, Qiming) 16 November 2011 (2011-11-16) entire document	1-11
A	WO 2018128316 A1 (SAMSUNG ELECTRONICS CO., LTD.) 12 July 2018 (2018-07-12) entire document	1-11
A	JP H08285430 A (HOSHIZAKI ELECTRIC CO., LTD.) 01 November 1996 (1996-11-01) entire document	1-11

☑ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
02 December 2020	**16 December 2020**

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	KR 100871616 B1 (YOUNGONE CORP.) 02 December 2008 (2008-12-02) entire document	1-11

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
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KR 100871616 B1	02 December 2008	None	

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