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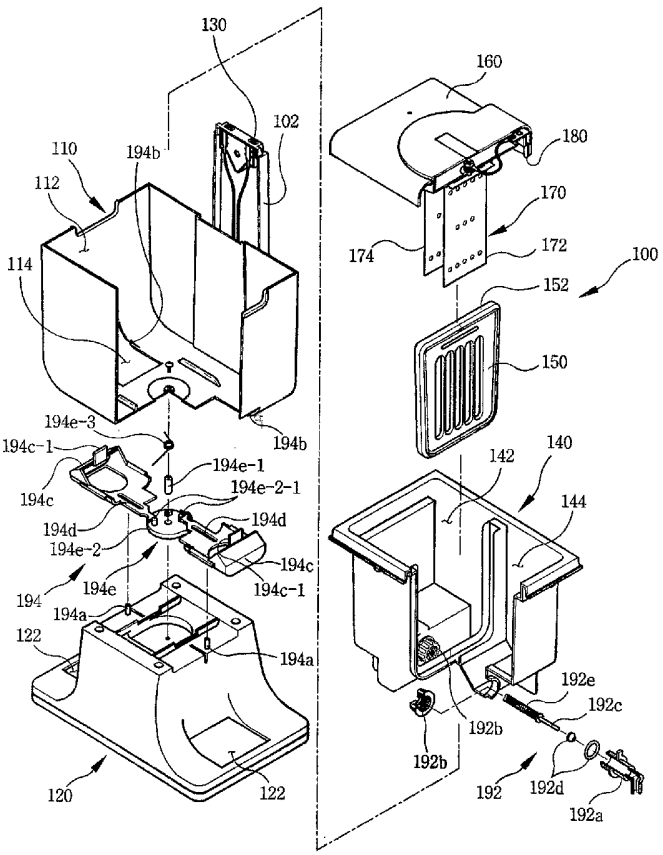
(54) Title: ELECTROLYSIS APPARATUS FOR PRODUCING IONIZED WATER



(57) Abstract: Disclosed herein is an electrolysis apparatus for producing ionized water, which has a small size to wash and sterilize various articles at home or in small hospitals. The apparatus includes a main body defining an external appearance and having dispensing holes and both sides thereof. A body support supports the main body at a predetermined height. A power socket is provided on an upper portion of a front portion of the main body. An electrolytic bath has, on both sides thereof, anode and cathode chambers containing water to execute electrolysis. Ion exchange is executed through an ion exchange membrane. A bath lid closes an upper portion of the main body. A power plug supplies electricity to electrodes comprising anode and cathode plates. An ionized water dispensing means dispenses ionized water from the anode and cathode chambers to the outside. An on/off switch turns the electricity on or off.

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DESCRIPTION

ELECTROLYSIS APPARATUS FOR PRODUCING IONIZED WATER

Technical Field

The present invention relates, in general, to electrolysis apparatuses for producing ionized water which is suitable for washing laundry and dishes, sterilizing medical instruments, washing vegetables, meat, and fish, and washing the face, and, more particularly, to an electrolysis apparatus for producing ionized water which has sterilizing and cleansing properties through electrolysis of tap water, without using chemicals or a detergent, such as a surfactant.

Background Art

Generally, when laundry or dishes are washed, medical instruments are sterilized, vegetables, meat, and fish are washed, or a person washes his/her hands or face, chemicals or a surfactant, such as soap, are used.

However, when using the chemicals or a surfactant, such as soap, a person's hands may become irritated, and besides, the chemicals or a surfactant may remain in the washed object. The chemicals and a surfactant may be unsafe, and the chemicals and a surfactant may contain harmful substances. Further, in order to prevent the

detergent from remaining in the object, the object must be repeatedly rinsed using a large amount of water, thereby wasting water.

As well known to the general public, everyone wants to use clean water. In an effort to provide clean water, an apparatus was developed that uses electrolysis to produce oxidized water or alkaline water with sterilizing and cleansing properties.

Such an apparatus electrolyzes water containing an electrolyte, thus producing acidic ionized water and alkaline ionized water. The acidic ionized water has strong acidity to exhibit a strong sterilizing capacity, and is deionized after sterilization is performed. The alkaline ionized water has strong alkalinity to exhibit a protein removing capacity.

When the ionized water produced through electrolysis is utilized for washing laundry or dishes, the water has a washing capacity similar to or better than a surfactant. Further, even when a person carelessly drinks the ionized water, the ionized water does not harm the person. Furthermore, when the ionized water touches a person's hand, his or her skin is not irritated. Thus, the ionized water is very safe and easy to use.

Moreover, the ionized water produced through electrolysis can be drained without additional wastewater treatment after the washing operation is completed, thus

being very easy to treat.

However, the conventional apparatus is designed to produce large quantities of ionized water for industrial facilities. Thus, it is difficult to use the conventional apparatus at home or in a small hospital. That is, hitherto, there has not been developed a small-sized apparatus for producing ionized water, which can be utilized for washing laundry, dishes, medical instruments, vegetables, meat, fish, and a person's hands. Thus, a person must reluctantly use detergent.

Description of Drawings

FIG. 1 is an exploded perspective view of an electrolysis apparatus for producing ionized water, according to the present invention;

FIG. 2 is a perspective view of the electrolysis apparatus for producing ionized water, according to the present invention;

FIG. 3 is a front sectional view of the electrolysis apparatus for producing ionized water, according to the present invention;

FIG. 4 is a side sectional view of the electrolysis apparatus for producing ionized water, according to the present invention;

FIG. 5 is a vertical sectional view of an ionized water dispensing means of the electrolysis apparatus,

according to the present invention, when the ionized water dispensing means is pressed;

FIG. 6 is a vertical sectional view of the ionized water dispensing means, according to the present invention, when the ionized water dispensing means returns to an original state thereof;

FIG. 7 is an exploded perspective view of a dispensing valve of the electrolysis apparatus, according to the present invention; and

FIG. 8 is an enlarged perspective view to show a dispensing lever of the electrolysis apparatus, according to the present invention.

Disclosure

Technical Problem

Accordingly, the present invention has been made keeping in mind the above problems occurring in the prior art, and an object of the present invention is to provide a small-sized electrolysis apparatus for producing ionized water at home or in small hospitals. The ionized water produced through the apparatus can be used to wash laundry, dishes, medical instruments, vegetables, meat, fish, and a person's hands at home or in small hospitals.

Another object of the present invention is to allow acidic ionized water with sterilizing capacity and alkaline

ionized water with protein removing capacity to be diluted with regular water and used for washing laundry, dishes, medical instruments, vegetables, meat, fish, a person's hands, etc, in place of using chemicals or a surfactant, such as soap, thus effectively removing harmful substances from an object to be washed, and thereby preventing the harmful substances from remaining in the washed object.

A further object of the present invention is to allow acidic ionized water with sterilizing capacity and alkaline ionized water with protein removing capacity to be diluted with regular water and used for washing laundry, dishes, medical instruments, vegetables, meat, fish, a person's hands, etc, in place of using chemicals or a surfactant, such as soap, thus preventing chemicals and a surfactant from remaining in a washed object, therefore ensuring the user's safety.

Yet another object of the present invention is to prevent water waste, because it is unnecessary to use an excessive amount of water to rinse harmful substances from in an object to be washed, due to use of chemicals or detergent, such as a surfactant.

Still another object of the present invention is to allow acidic ionized water or alkaline ionized water to be diluted with regular water at a predetermined ratio and used for washing laundry, dishes, medical instruments, vegetables, meat, fish, and a person's hands, etc, thus

permitting environmentally friendly wastewater treatment.

Technical Solution

In order to accomplish the above object(s), the present invention provides an electrolysis apparatus for producing ionized water, including: a main body defining an external appearance of the electrolysis apparatus and opened at an upper portion thereof, with a mounting space defined in the main body, and dispensing holes each having a predetermined size provided on both sides of a lower portion of the mounting space; a body support to support the main body at a predetermined height; a power socket provided at an upper portion of a front portion of the main body; an electrolytic bath with a size suitable to be installed in the mounting space, the electrolytic bath including, on both sides thereof, an anode chamber and a cathode chamber respectively containing water to execute electrolysis; an ion exchange membrane detachably installed between the anode and cathode chambers, so that ion exchange is executed through the ion exchange membrane; a bath lid to close an upper portion of the main body including the electrolytic bath; a pair of electrodes comprising an anode plate and a cathode plate that are mounted to a lower surface of the bath lid and are provided on opposite sides of the ion exchange membrane to be spaced apart from each other at a predetermined interval; a power

plug provided on a lower portion of a front portion of the bath lid to correspond to the power socket, the power plug being connected to or disconnected from the power socket as the bath lid is closed or opened, thus controlling a supply of electricity; an ionized water dispensing means to dispense ionized water from the anode and cathode chambers to an outside; and an on/off switch mounted to the front portion of the main body to turn the electricity on or off.

Further, a timer may be mounted to a front surface of the body support to control the electrolysis time.

The electrolysis apparatus may further include a cup holder provided on an upper surface of a lower portion on each of both sides of the body support in a form of a flat depression, thus allowing the ionized water to be dispensed from the ionized water dispensing means to a cup which is held on the cup holder.

A circuit breaker is provided on a bottom of the body support to break the electricity to insure electrical safety when the electrolysis apparatus falls over.

The ionized water dispensing means includes a dispensing valve provided on a lower portion of each of the anode and cathode chambers, thus dispensing ionized water from each of the anode and cathode chambers to an outside; and a dispensing lever installed at a predetermined position of the main body to be operated in conjunction with the dispensing valve, the dispensing lever moving

horizontally to press or release the dispensing valve, thus dispensing the ionized water from each of the anode and cathode chambers to the outside.

The dispensing valve includes a dispensing pipe coupled to each of the anode and cathode chambers of the electrolytic bath, thus dispensing the ionized water; a pipe securing nut provided in each of the anode and cathode chambers to be fastened to an end of the dispensing pipe through a screw-type fastening method, so that the dispensing pipe is secured to each of the anode and cathode chambers; a valve control knob fitted into the dispensing pipe to open or close the dispensing pipe, with an end of the valve control knob exposed to an outside of the dispensing pipe; a watertight sealing member provided on a predetermined portion of the valve control knob to make the valve watertight when the dispensing pipe is closed; and a spring installed in the dispensing pipe to bias the valve control knob in a direction of closing the dispensing pipe.

The dispensing lever of the ionized water dispensing means includes a guide projection projecting from each of both sides of a lower portion of the main body; a guide rail provided in each of the dispensing holes of the main body; a knob press lever installed to horizontally move along the guide rail, and having a press piece to press the end of the valve control knob using an external force, when a user desires to dispense the ionized water; a rectangular

guide groove provided on a predetermined portion of the knob press lever to engage with the guide projection, and cooperating with the guide projection to linearly move the knob press lever; and a lever return means provided on the lower portion of the main body to return the knob press lever to an original position thereof, when the external force is released from the knob press lever.

The lever return means includes a rotating shaft mounted to the lower portion of the main body; a rotating disc rotatably coupled to the rotating shaft, with a press protrusion being provided on an upper surface of the rotating disc to come in contact with an end of the knob press lever; and a return spring mounted to a lower portion of the rotating disc to bias the rotating disc in a direction of returning the rotating disc to an original position thereof. Such a lever return means is operated as follows. That is, when the knob press lever is pressed by an external force to dispense the ionized water, the rotating disc is rotated in a predetermined direction by cooperation with the knob press lever and the press protrusion. When the external force is removed, the knob press lever is pushed outwards by cooperation with the press protrusion and the rotating disc rotated by a restoring force of the return spring.

Advantageous Effects

According to the present invention, the present invention is to provide a small-sized electrolysis apparatus for producing ionized water at home or in small hospitals. The ionized water produced through the apparatus can be used to wash laundry, dishes, medical instruments, vegetables, meat, fish, and a person's hands at home or in small hospitals.

Further, the present invention allows acidic ionized water with sterilizing capacity and alkaline ionized water with protein removing capacity to be diluted with regular water and used for washing laundry, dishes, medical instruments, vegetables, meat, fish, a person's hands, etc, in place of using chemicals or a surfactant, such as soap, thus effectively removing harmful substances from an object to be washed, and thereby preventing the harmful substances from remaining in the washed object.

The present invention allows acidic ionized water with sterilizing capacity and alkaline ionized water with protein removing capacity to be diluted with regular water and used for washing laundry, dishes, medical instruments, vegetables, meat, fish, a person's hands, etc, in place of using chemicals or a surfactant, such as soap, thus preventing chemicals and a surfactant from remaining in a washed object, therefore ensuring the user's safety.

Further, the present invention prevents water waste, because it is unnecessary to use an excessive amount of

water to rinse harmful substances from in an object to be washed, due to use of chemicals or detergent, such as a surfactant.

Furthermore, the present invention allows acidic ionized water or alkaline ionized water to be diluted with regular water at a predetermined ratio and used for washing laundry, dishes, medical instruments, vegetables, meat, fish, and a person's hands, etc, thus permitting environmentally friendly wastewater treatment.

Best Mode

An electrolysis apparatus for producing ionized water according to a preferred embodiment of the present invention will be described in detail below.

FIG. 1 is an exploded perspective view of an electrolysis apparatus for producing ionized water, according to the present invention, FIG. 2 is a perspective view of the electrolysis apparatus for producing ionized water, according to the present invention, FIG. 3 is a front sectional view of the electrolysis apparatus for producing ionized water, according to the present invention, and FIG. 4 is a side sectional view of the electrolysis apparatus for producing ionized water, according to the present invention.

As shown in FIGS. 1 to 4, the electrolysis apparatus 100 for producing ionized water, according to the present invention includes a main body 110 which is opened at an

upper portion thereof. A mounting space 112 is defined in the main body 110, and dispensing holes 114 each having a predetermined size are provided on both sides of a lower portion of the main body 110. A body support 120 functions to support the main body 110 at a predetermined height. A power socket 130 is provided at a predetermined position of the upper portion of the main body 110. An electrolytic bath 140 is installed in the mounting space 112, and includes an anode chamber 142 and a cathode chamber 144 to execute electrolysis. An ion exchange membrane 150 is detachably installed between the anode and cathode chambers 142 and 144, so that ion exchange is carried out through the ion exchange membrane 150. A bath lid 160 functions to open or close an upper portion of the electrolytic bath 140. A pair of electrodes 170 comprises an anode plate 172 and a cathode plate 174 that are mounted to a lower surface of the bath lid 160 and are provided on opposite sides of the ion exchange membrane 150 to be spaced apart from each other. A power plug 180 is electrically connected to the power socket 130 to supply electricity to the electrodes 170. An ionized water dispensing means 190 functions to dispense ionized water from the anode and cathode chambers 142 and 144 to the outside. The electrolysis apparatus 100 also includes an on/off switch 200 to turn the electricity on or off.

In order to operate the electrolysis apparatus 100

according to the present invention, a predetermined amount of tap water is supplied to each of the anode chamber 142 and the cathode chamber 144 of the electrolytic bath 140, and the bath lid 160 closes the upper portion of the electrolytic bath 140. When the bath lid 160 closes the upper portion of the electrolytic bath 140, the power socket 130 is electrically connected to the power plug 180.

In such a state, the on/off switch 200 is turned on. At this time, electricity is applied to the electrodes 170 which are mounted to the lower surface of the bath lid 160 to be immersed in the tap water contained in the anode and cathode chambers 142 and 144, respectively, so that the electrolysis is executed in the anode and cathode chambers 142 and 144.

While the electrolysis is executed as described above, tap water contained in the anode and cathode chambers 142 and 144, respectively, executes ion exchange through the ion exchange membrane 150. That is, anions in the anode chamber 142 move through the ion exchange membrane 150 to the cathode chamber 144 in which the anode plate 172 is positioned. Further, cations in the cathode chamber 144 move through the ion exchange membrane 150 to the anode chamber 142 in which the cathode plate 174 is positioned.

Thus, when ion exchange is carried out during electrolysis, cationic water, that is, alkaline ionized

water, is produced in the anode chamber 142, and anionic water, that is, acidic ionized water, is produced in the cathode chamber. As such, the alkaline ionized water produced through electrolysis is used to wash laundry or fruits, whereas the acidic ionized water is used as cosmetic water for skin or sterilizing water for medical instruments. In this case, undiluted alkaline ionized water and acidic ionized water are not used, but diluted solutions prepared by adding a predetermined amount of alkaline or acidic ionized water to water are used as washing water, cosmetic water, or sterilizing water.

The electrolysis apparatus 100 according to the present invention further includes a timer 210 which is mounted to a front surface of the body support 120. A user can set an electrolysis time as desired, using the timer 210. By controlling the electrolysis time through the timer 210, the pH of the alkaline ionized water and the acidic ionized water can be controlled.

In a detailed description, although the same amount of tap water is fed into the electrolytic bath 140, the pH of the alkaline ionized water and the acidic ionized water is controlled by varying the electrolysis time. Moreover, according to the present invention, the timer 210 controls the electrolysis time as desired, thus allowing water with proper pH, according to a desired purpose, to be obtained.

Further, the electrolysis apparatus further includes

cup holders 122 which are provided on upper surfaces of lower portions of both sides of the body support 120 in the form of a flat depression, thus allowing the ionized water to be dispensed through the ionized water dispensing means 190 to cups (not shown) that are held on the cup holders 122.

The cup holders 122 constructed as described above allow a user to easily use the produced ionized water. That is, when the user desires to use the ionized water, the user has only to evenly place the cups on the cup holders 122 so that the ionized water is dispensed to the cups. The cup holders 122 are especially useful to dispense a desired amount of ionized water using a measuring cup.

According to the present invention, the electrolysis apparatus 100 further includes a circuit breaker 220 to interrupt the electricity to insure electrical safety when the electrolysis apparatus 100 falls over. The circuit breaker 220 causes electricity to be continuously applied to the electrolysis apparatus 100 when depressed by the weight of the electrolysis apparatus 100. When the electrolysis apparatus 100 falls over, a spring (not shown) is expanded, thus interrupting the electricity fed to the electrolysis apparatus 100.

The construction of the electrolysis apparatus 100 according to the present invention will be described in detail below. The main body 110 receives the electrolytic

bath 140 therein. The main body 110 is opened at the upper portion thereof, and defines the mounting space 112 therein. Further, the dispensing holes 114 each having a predetermined size are provided on both sides of the lower portion of the mounting space 112 to be opened outward. According to the present invention, the main body 110 has a bilaterally symmetrical structure, as shown in FIGS. 1 to 3.

The dispensing holes 114 of the main body 110 constructed as described above allow the ionized water to be dispensed toward the cup holders 122 of the body support 120, by the ionized water dispensing means 190 which will be described in detail later.

The body support 120 functions to support the main body 110 at a predetermined height. Such a body support 120 is fastened to the lower portion of the main body 110 by fastening screws (not shown), thus supporting the main body 110 at the predetermined height.

As shown in FIGS. 1 to 3, the body support 120 is constructed to be tapered in a direction from a lower portion to an upper portion of the body support 120. Thus, although the upper portion of the body support 120 is fastened to the lower portion of the main body 110, the dispensing holes 114 of the main body 110 are opened downward without being covered.

Meanwhile, the lower portion of the body support 120

has a wide area to stably support the electrolysis apparatus 100, when the electrolysis apparatus 100 is set upon the ground. On both sides of the upper surface of the lower portion of the body support 120 are provided the cup holders 122 each having the form of a flat depression, thus holding the cups to catch ionized water dispensed through the dispensing holes 114 of the electrolysis apparatus 100.

The power socket 130 functions to supply electricity to the electrodes 170. The power socket 130 is provided on an upper end of a closing unit 102 which extends from the front surface of the body support 120 to the front surface of the main body 110. The height of the upper end of the closing unit 102 depends on the height of the upper end of the main body 110.

As such, because the power socket 130 is placed at the same height as the upper end of the main body 110, the power socket 130 can be electrically connected to the power plug 180 provided on a lower end of a front portion of the bath lid 160 by simply covering the bath lid 160 on the upper portion of the main body 110. That is, by closing or opening the bath lid 160 relative to the main body 110, the power socket 130 is electrically connected to or disconnected from the power plug 180.

The electrolytic bath 140 stores tap water therein to conduct electrolysis. In order to carry out the electrolysis of the anode and cathode plates, the

electrolytic bath 140 is opened at an upper portion thereof, and the anode chamber 142 and the cathode chamber 144 are provided on both sides of the electrolytic bath 140. That is, as described above, the electrolytic bath 140 is provided with the anode chamber 142 to produce the alkaline ionized water and the cathode chamber 144 to produce the acidic ionized water.

As described above, a size of the electrolytic bath 140 having the anode and cathode chambers 142 and 144 is determined, according to a size of the mounting space 112 of the main body 110, so that the electrolytic bath 140 is installed in the mounting space 112 of the main body 110.

The ion exchange membrane 150 functions to allow movement of cations and anions between the anode chamber 142 and the cathode chamber 144, while electrolysis is conducted in the anode and cathode chambers 142 and 144 of the electrolytic bath 140. The ion exchange membrane 150 is detachably installed between the anode chamber 142 and the cathode chamber 144, so that ion exchange occurs through the ion exchange membrane 150.

A watertight sealing member 152, made of a rubber material, is provided on an edge of the ion exchange membrane 150 which is detachably installed between the anode and cathode chambers 142 and 144, thus preventing water from leaking from the anode chamber 142 to the cathode chamber 144, and vice versa.

Thus, leakage of water contained in the anode and cathode chambers 142 and 144 is prevented by the watertight sealing member 152 made of a rubber material. In such a state, only the ion exchange is carried out through the ion exchange membrane 150. In other words, the exchange of water contained in the anode and cathode chambers 142 and 144 is prevented by the watertight sealing member 152 which is provided on the edge of the ion exchange membrane 152, while ion exchange is carried out through the ion exchange membrane 150.

The bath lid 160 functions to open or close the upper portion of the main body 110 including the electrolytic bath 140. The bath lid 160 has a size corresponding to the size of an opening provided on the upper portion of the main body 110, thus opening or closing the upper portion of the main body 110 including the electrolytic bath 140.

The electrodes 170 function to electrolyze water contained in the electrolytic bath 140 by the passage of electricity, thus producing the alkaline ionized water and the acidic ionized water. The electrodes 170 comprise the anode and cathode plates 172 and 174 that are mounted to the lower surface of the bath lid 140 and are provided on opposite sides of the ion exchange membrane 150 to be spaced apart from each other at a predetermined interval.

In a pair of electrodes 170 comprising the anode and cathode plates 172 and 174, the anode plate 172 is

positioned in the cathode chamber 144, while the cathode plate 174 is positioned in the anode chamber 142. When electricity is applied to the anode and cathode plates 172 and 174, anions in the anode chamber 142 move through the ion exchange membrane 150 to the cathode chamber 144 in which the anode plate 172 is positioned. Meanwhile, cations in the cathode chamber 142 move through the ion exchange membrane 150 to the anode chamber 142 in which the cathode plate 174 is positioned. In this way, ion exchange is performed.

Thus, as described above, when the ion exchange is carried out during electrolysis, cationic water, that is, alkaline ionized water, is produced in the anode chamber 142. Further, anionic water, that is, acidic ionized water, is produced in the cathode chamber.

The power plug 180 functions to supply electricity to the electrodes 170. The power plug 180 is provided on the lower portion of the front portion of the bath lid 160 to be operated in conjunction with the power socket 130.

As the bath lid 160 is opened or closed, the power plug 180 constructed as described above is disconnected from or connected to the power socket 130, thus controlling the supply of electricity to the electrodes 170. That is, the power socket 130 is electrically connected to the power plug 180, by simply covering the bath lid 160 on the upper portion of the main body 110. Further, the power socket 130

is electrically disconnected from the power plug 180, by simply opening the bath lid 160 to open the main body 110.

The ionized water dispensing means 190 functions to dispense ionized water produced in the anode and cathode chambers 142 and 144 to the outside. Such an ionized water dispensing means 190 includes dispensing valves 192 and a dispensing lever 194. One dispensing valve 192 is provided on a lower portion of each of the anode chamber 142 and the cathode chamber 144 to dispense ionized water from the anode and cathode chambers 142 and 144 to the outside. The dispensing lever 194 is installed at a predetermined position on the main body 110 to be operated in conjunction with the dispensing valves 192, and moves horizontally to push or release the dispensing valves 192, thus dispensing the ionized water from the anode and cathode chambers 142 and 144.

After the cationic water, that is, the alkaline ionized water, and the anionic water, that is, the acidic ionized water, are produced in the anode chamber 142 and the cathode chamber 144, respectively, through electrolysis, the ionized water is dispensed through the ionized water dispensing means 190 constructed as described above. That is, when a user desires to use the alkaline ionized water and the acidic ionized water, the dispensing lever 194 is pressed to open each of the dispensing valves 192, thus dispensing the ionized water to the outside. The

construction and operation of the ionized water dispensing means 190 will be described in detail hereinafter with reference to FIGS. 5 to 7.

The on/off switch 200 functions to control the supply of electricity to the electrolysis apparatus 100. Such an on/off switch 200 is provided on the front surface of the main body 110 to turn on or off the electricity. In a detailed description, the on/off switch 200 is provided on a front surface of the lower portion of the closing unit 102 which extends from the front surface of the body support 120 to the front surface of the main body 110.

FIG. 5 is a vertical sectional view of the ionized water dispensing means, according to the present invention, when the ionized water dispensing means is pressed, FIG. 6 is a vertical sectional view of the ionized water dispensing means, according to the present invention, when the ionized water dispensing means returns to an original state thereof, FIG. 7 is an exploded perspective view of the dispensing valve of the electrolysis apparatus, according to the present invention, and FIG. 8 is an enlarged perspective view to show the dispensing lever of the electrolysis apparatus, according to the present invention.

FIGS. 5 to 8 show the ionized water dispensing means 190. As shown in FIGS. 5, 6, and 7, each of the dispensing valves 192 includes a dispensing pipe 192a which is coupled

to each of the anode and cathode chambers 142 and 144 of the electrolytic bath 140, thus dispensing the ionized water. A pipe securing nut 192b is provided in each of the anode and cathode chambers 142 and 144 to be fastened to an end of an associated dispensing pipe 192a through a screw-type fastening method, thus securing the dispensing pipe 192a to each of the anode and cathode chambers 142 and 144. A valve control knob 192c is fitted into each of the dispensing pipes 192a to open or close the dispensing pipe 192a, and an end of the valve control knob 192c is exposed to the outside. A watertight sealing member 192d is provided on a predetermined portion of each valve control knob 192c, thus sealing the gap between the valve control knob 192c and the dispensing pipe 192a, when each dispensing pipe 192a is closed. A spring 192e is installed in each dispensing pipe 192a to bias each valve control knob 192c in the direction of closing the dispensing pipe 192a.

In each of the dispensing valves 192 constructed as described above, as shown in FIG. 5, when the valve control knob 192c is pressed by the dispensing lever 194, the watertight sealing member 192d which is installed in the dispensing pipe 192a to close the neck of the dispensing pipe 192a moves away from the neck. Thereby, the dispensing pipe 192a is opened, so that the ionized water produced in the anode or cathode chamber 142 or 144 of the electrolytic

bath 140 is dispensed through the dispensing pipe 192a.

In each of the dispensing valves 192, the dispensing pipe 192a is coupled to each of the anode and cathode chambers 142 and 144 of the electrolytic bath 140, thus dispensing ionized water. An end of the dispensing pipe 192a is placed in each of the anode and cathode chambers 142 and 144 to be fastened to the pipe securing nut 192b in each of the anode and cathode chambers 142 and 144, through the screw-fastening method. The neck is formed in a predetermined position of each dispensing pipe 192a.

The pipe securing nuts 192b function to fasten the dispensing pipes 192a to the anode and cathode chambers 142 and 144, respectively. The pipe securing nuts 192b are fastened to the ends of the dispensing pipes 192a placed in the anode chamber 142 and the cathode chamber 144 through the screw-type fastening method, thus allowing the dispensing pipes 192a to be fastened to the anode and cathode chambers 144, respectively.

Each of the valve control knobs 192c functions to open or close an associated dispensing pipe 192a. Each of the valve control knobs 192c is installed in an associated dispensing pipe 192a, with a stepped portion provided on a predetermined position of the valve control knob 192c to correspond to the neck of the dispensing pipe 192a. The neck of each dispensing pipe 192a is opened or closed by the stepped portion of an associated valve control knob

192c.

In each of the valve control knobs 192c constructed as described above, an end of the valve control knob 192c is exposed to an outside of an associated dispensing pipe 192a to be pressed by the dispensing lever 194.

Each watertight sealing member 192d seals the gap between the stepped portion of each valve control knob 192c and the neck of an associated dispensing pipe 192a, and is seated on the stepped portion of each valve control knob 192c. In this case, each watertight sealing member 192d is made of a rubber material.

Each of the springs 192e functions to return an associated valve control knob 192c to an original position thereof, when an external force is removed. Each spring 192e is fitted over a rear end of each valve control knob 192c placed in each dispensing pipe 192a, thus biasing the valve control knob 192c in a direction of closing the dispensing pipe 192a.

As shown in FIGS. 5, 6, and 8, the dispensing lever 194 of the ionized water dispensing means 190 includes a guide projection 194a which projects from each of both sides of the upper portion of the body support 120 corresponding to the lower portion of the main body 110. A guide rail 194b is provided in each of the dispensing holes 114 of the main body 110. A knob press lever 194c is installed to horizontally move along each guide rail 194b,

and has a press piece 194c-1 to press an end of an associated valve control knob 192c using an external force, when a user desires to dispense the ionized water. A rectangular guide groove 194d is provided on each of the knob press levers 194c to engage with an associated guide projection 194a, and cooperates with the guide projection 194a to linearly move each knob press lever 194c. Further, a lever return means 194e is provided on the lower portion of the main body 110, thus returning each knob press lever 194c to an original position thereof, when the external force is released from each knob press lever 194c.

The lever return means 194e includes a rotating shaft 194e-1 which is mounted to the lower portion of the main body 110. A rotating disc 194e-2 is rotatably coupled to the rotating shaft 194e-1. Press protrusions 194e-2-1 are provided on the rotating disc 194e-2 to be spaced apart from each other at a predetermined interval, and come in contact with ends of the corresponding knob press levers 194c. A return spring 194e-3 is mounted on a lower portion of the rotating disc 194e-2, thus biasing the rotating disc 194e-2 in a direction of returning the rotating disc 194e-2 to an original position thereof.

In the dispensing lever 194 constructed as described above, when each knob press lever 194c is pressed by an external force to dispense the ionized water, the rotating disc 194e-2 is rotated in a predetermined direction by

cooperation with each knob press lever 194c and each press protrusion 194e-2-1. Meanwhile, when the external force is removed, each knob press lever 194c is pushed outwards by each press protrusion 194e-2-1 and the rotating disc 194e-2 which is rotated in a reverse direction by a restoring force of the return spring 194e-3, so that each knob press levers 194c returns to an original position thereof.

A detailed description of the dispensing lever 194 of the ionized water dispensing means 190 according to the present invention is as follows. The knob press levers 194c are installed so that only horizontal movement of the knob press levers 194c is allowed by the guide grooves 194d and the guide projections 194a. Thus, when a user presses the knob press levers 194c into the main body 110, the press pieces 194c-1 press the corresponding valve control knobs 192c of the dispensing valves 192, thus opening the dispensing pipes 192a. When the knob press levers 194c are pressed, the press protrusions 194e-2-1 coming in contact with the inside ends of the knob press levers 194c are pushed. Thereby, the rotating disc 194e-2 is rotated in a predetermined direction.

As described above, when the knob press levers 194c are pressed, the dispensing pipes 192a are opened, thus dispensing the ionized water. Thereafter, when the external force to press the knob press levers 194c is removed, each valve control knob 192c and each knob press lever 194

return to original positions thereof by restoring forces of the spring 192e of each dispensing valve 192 and the return spring 194e-3 of the dispensing lever 194. In this case, each knob press lever 194c returns to an original position thereof by cooperation with each press protrusion 194e-2-1 and the rotating disc 194e-2 rotated by the restoring force of the return spring 194e.

As described above, the present invention provides an electrolysis apparatus 100 for producing ionized water, which is manufactured to have a small size, thus being installed in a kitchen or a sterilizing room of a small hospital, and thereby producing alkaline or acidic ionized water to wash, sterilize, or disinfect a desired object.

Although the preferred embodiment of the present invention has been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

CLAIMS

1. An electrolysis apparatus for producing ionized water, comprising:

a main body defining an external appearance of the electrolysis apparatus and opened at an upper portion thereof, with a mounting space defined in the main body, and dispensing holes each having a predetermined size provided on both sides of a lower portion of the mounting space;

a body support to support the main body at a predetermined height;

a power socket provided at an upper portion of a front portion of the main body;

an electrolytic bath with a size suitable to be installed in the mounting space, the electrolytic bath including, on both sides thereof, an anode chamber and a cathode chamber respectively containing water to execute electrolysis;

an ion exchange membrane detachably installed between the anode and cathode chambers, so that ion exchange is executed through the ion exchange membrane;

a bath lid to close an upper portion of the main body including the electrolytic bath;

a pair of electrodes comprising an anode plate and a cathode plate that are mounted to a lower surface of the

bath lid and are provided on opposite sides of the ion exchange membrane to be spaced apart from each other at a predetermined interval;

a power plug provided on a lower portion of a front portion of the bath lid to correspond to the power socket, the power plug being connected to or disconnected from the power socket as the bath lid is closed or opened, thus controlling a supply of electricity;

ionized water dispensing means to dispense ionized water from the anode and cathode chambers to an outside; and

an on/off switch mounted to the front portion of the main body to turn the electricity on or off.

2. The electrolysis apparatus according to claim 1, further comprising: a timer mounted to a front surface of the body support to control the electrolysis time.

3. The electrolysis apparatus according to claim 1, further comprising: a cup holder provided on an upper surface of a lower portion on each of both sides of the body support in a form of a flat depression, thus allowing the ionized water to be dispensed from the ionized water dispensing means to a cup which is held on the cup holder.

4. The electrolysis apparatus according to claim 1,

further comprising: a circuit breaker provided on a bottom of the body support to break the electricity to insure electrical safety when the electrolysis apparatus falls over.

5. The electrolysis apparatus according to any one of claims 1 to 4, wherein the ionized water dispensing means comprises:

a dispensing valve provided on a lower portion of each of the anode and cathode chambers, thus dispensing ionized water from each of the anode and cathode chambers to an outside; and

a dispensing lever installed at a predetermined position of the main body to be operated in conjunction with the dispensing valve, the dispensing lever moving horizontally to press or release the dispensing valve, thus dispensing the ionized water from each of the anode and cathode chambers to the outside.

6. The electrolysis apparatus according to claims 5, wherein the dispensing valve comprises:

a dispensing pipe coupled to each of the anode and cathode chambers of the electrolytic bath, thus dispensing the ionized water;

a pipe securing nut provided in each of the anode and cathode chambers to be fastened to an end of the dispensing

pipe through a screw-type fastening method, so that the dispensing pipe is secured to each of the anode and cathode chambers;

a valve control knob fitted into the dispensing pipe to open or close the dispensing pipe, with an end of the valve control knob exposed to an outside of the dispensing pipe;

a watertight sealing member provided on a predetermined portion of the valve control knob to make the valve watertight when the dispensing pipe is closed; and

a spring installed in the dispensing pipe to bias the valve control knob in a direction of closing the dispensing pipe.

7. The electrolysis apparatus according to claim 6, wherein the dispensing lever of the ionized water dispensing means comprises:

a guide projection projecting from each of both sides of an upper portion of the body support to correspond to a lower portion of the main body;

a guide rail provided in each of the dispensing holes of the main body;

a knob press lever installed to horizontally move along the guide rail, and having a press piece to press the end of the valve control knob using an external force, when a user desires to dispense the ionized water;

a rectangular guide groove provided on a predetermined portion of the knob press lever to engage with the guide projection, and cooperating with the guide projection to linearly move the knob press lever; and

lever return means provided on the lower portion of the main body to return the knob press lever to an original position thereof, when the external force is released from the knob press lever.

8. The electrolysis apparatus according to claim 7, wherein the lever return means comprises:

a rotating shaft mounted to the lower portion of the main body;

a rotating disc rotatably coupled to the rotating shaft, with a press protrusion being provided on an upper surface of the rotating disc to come in contact with an end of the knob press lever; and

a return spring mounted to a lower portion of the rotating disc to bias the rotating disc in a direction of returning the rotating disc to an original position thereof,

wherein, when the knob press lever is pressed by an external force to dispense the ionized water, the rotating disc is rotated in a predetermined direction by cooperation with the knob press lever and the press protrusion, and, when the external force is removed, the knob press lever is

pushed outwards by cooperation with the press protrusion and the rotating disc rotated by a restoring force of the return spring.

FIG. 1

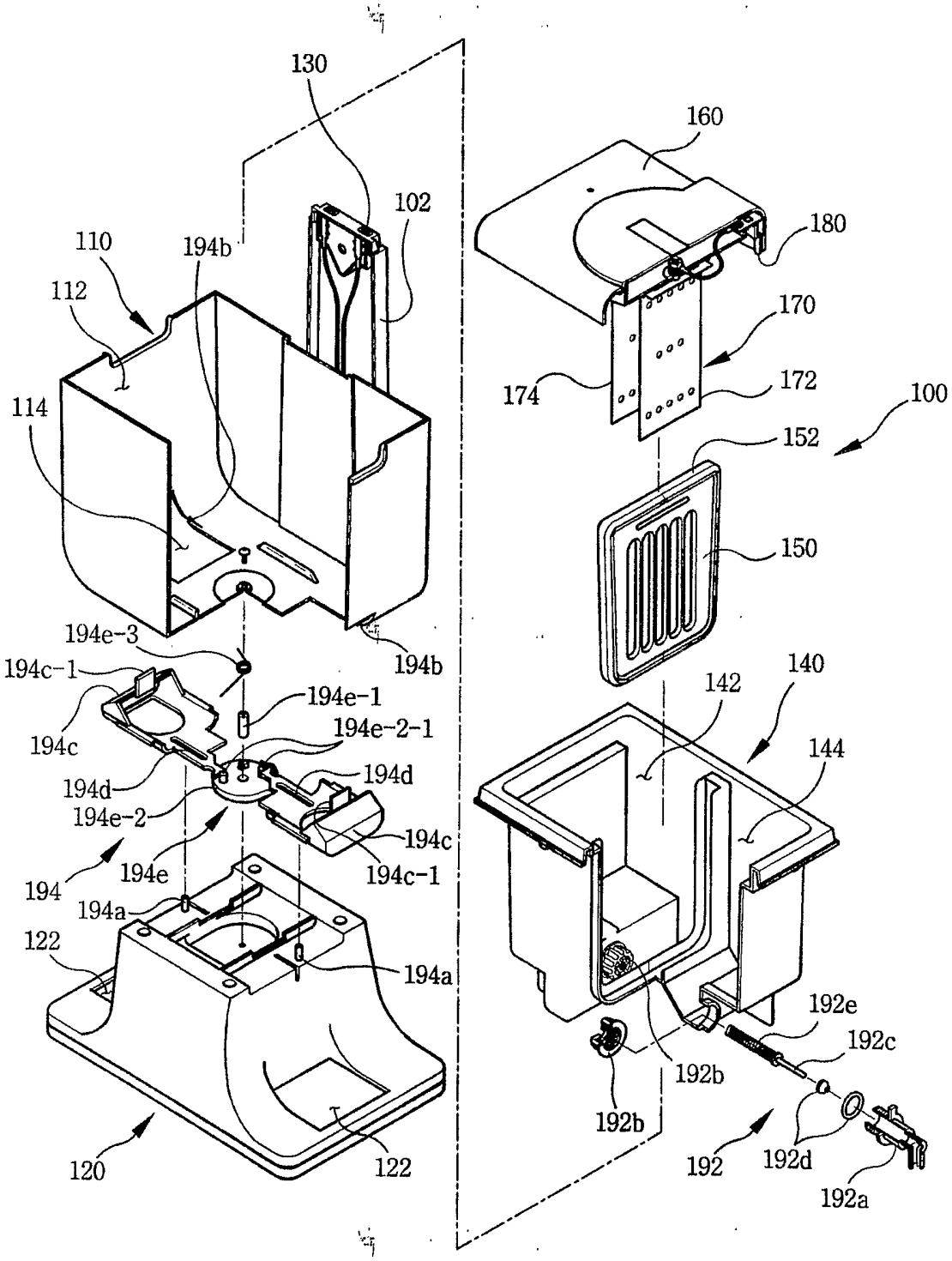
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FIG. 2

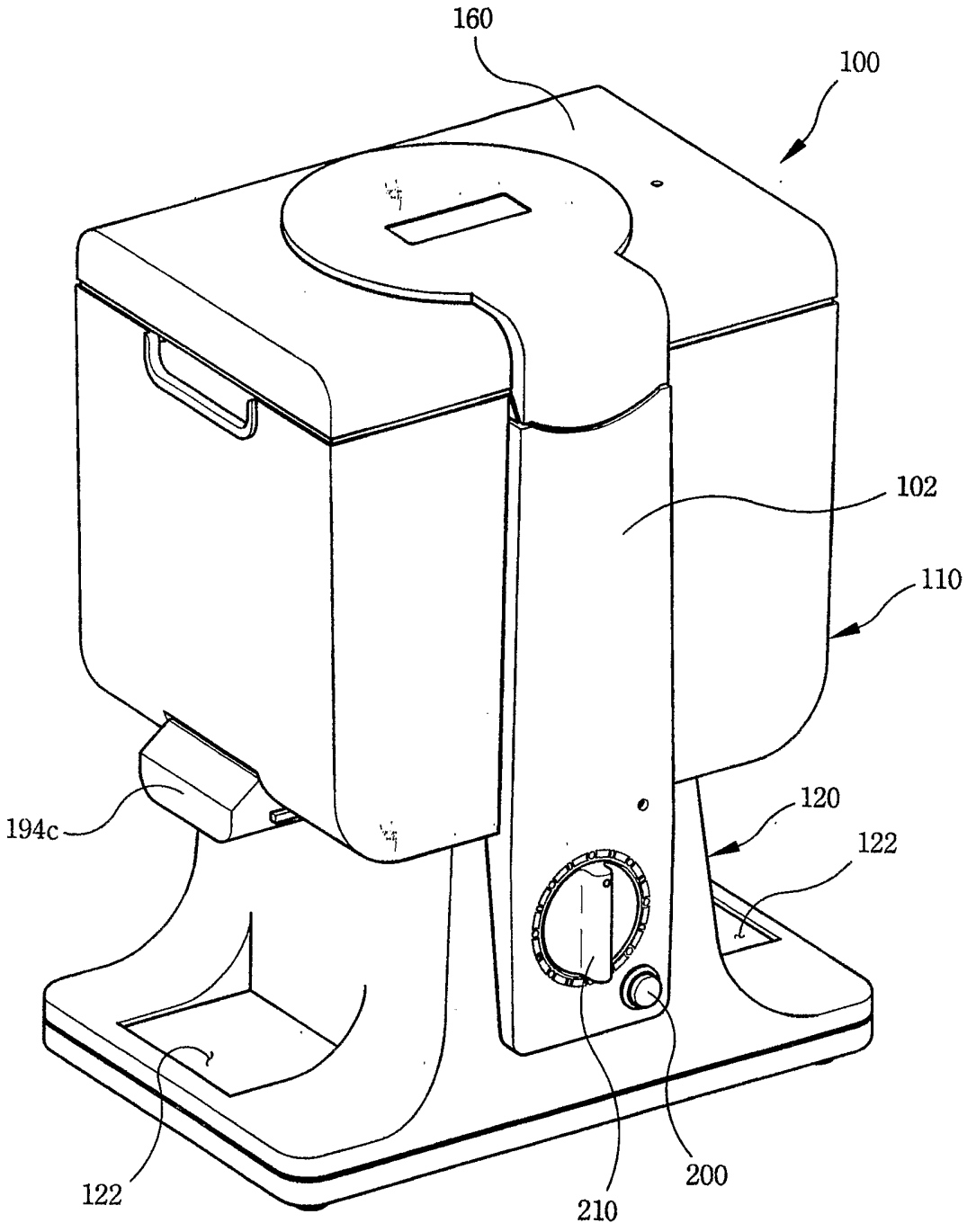

FIG. 3

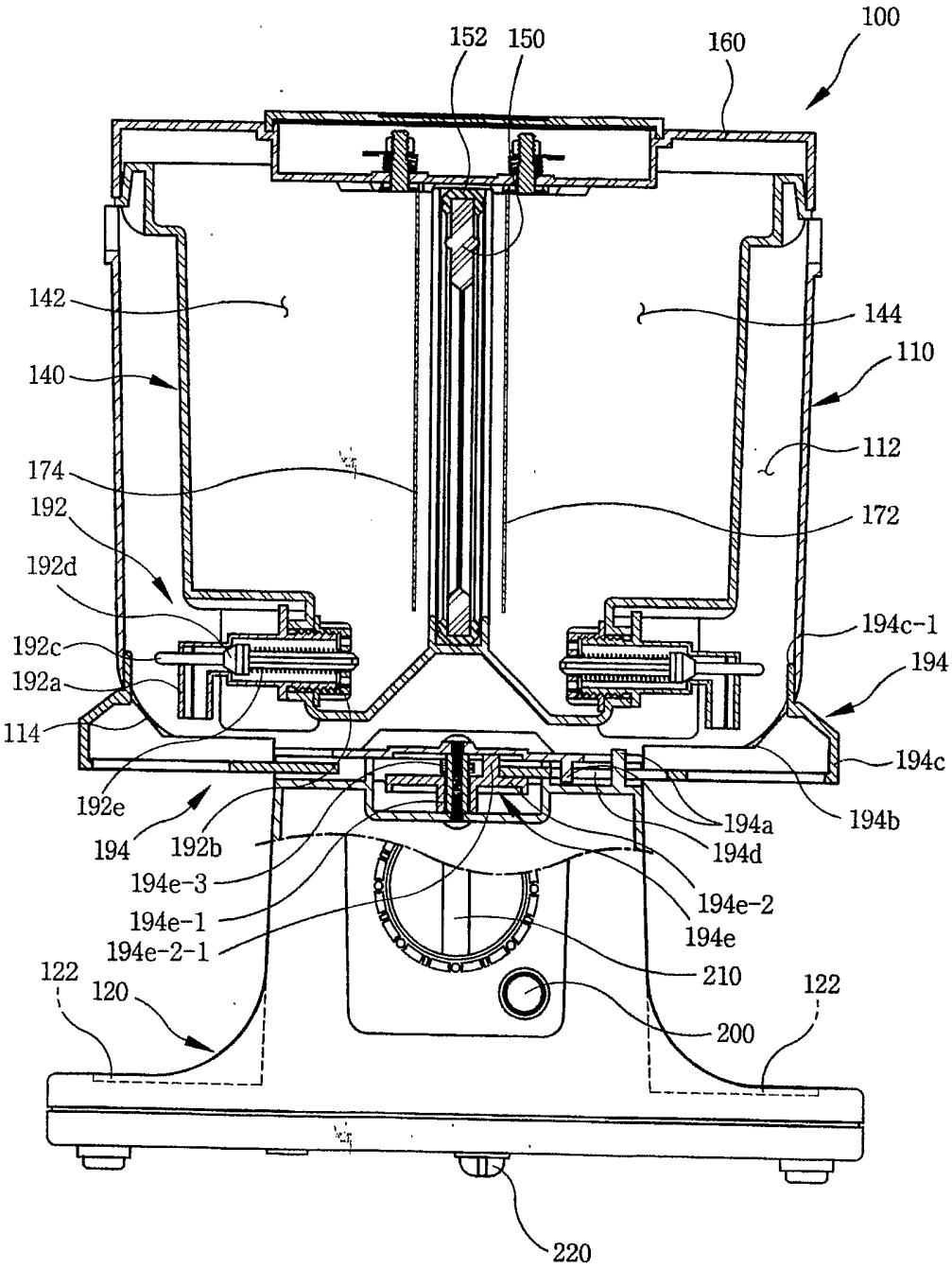
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FIG. 4

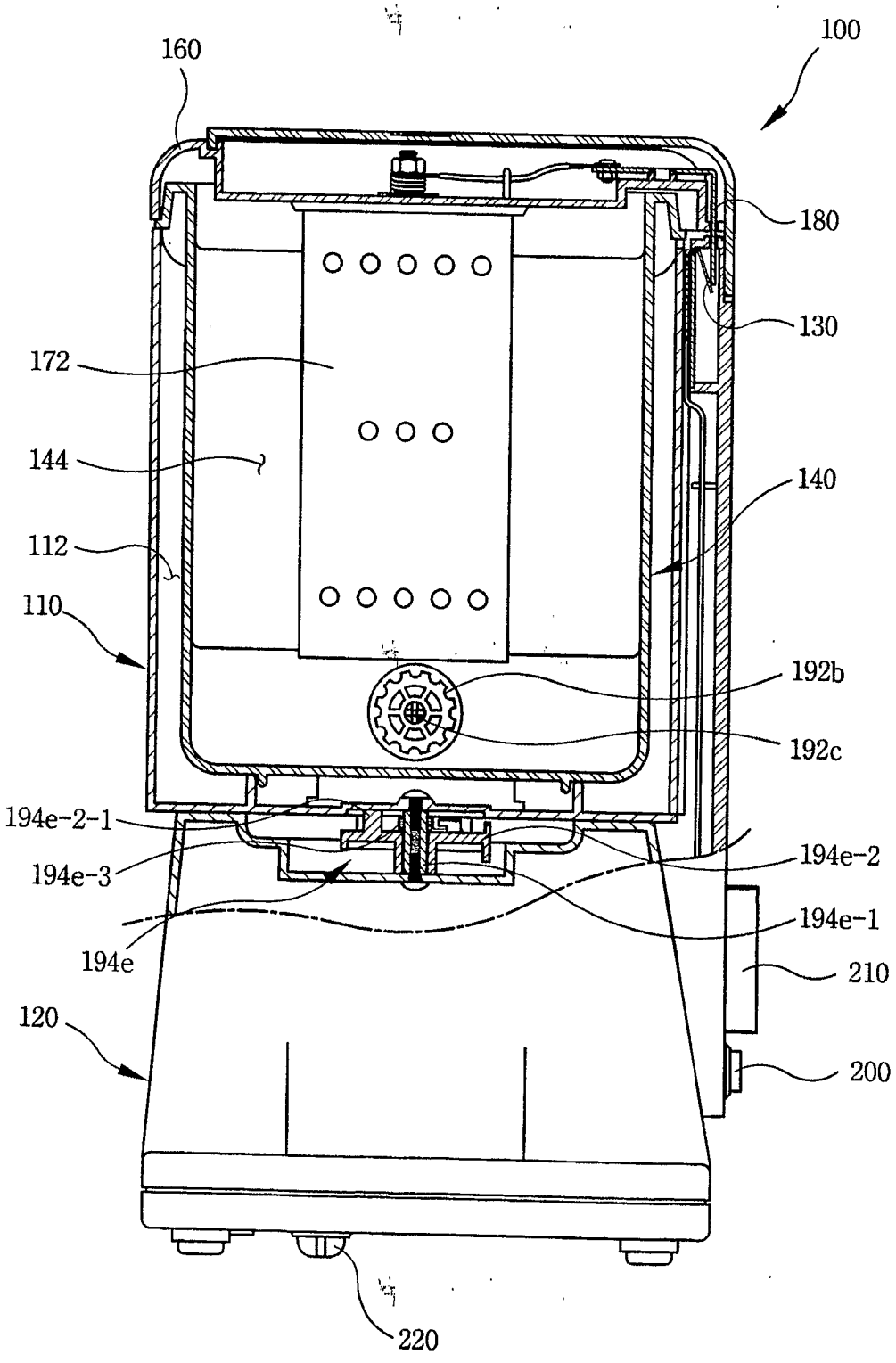
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FIG. 5

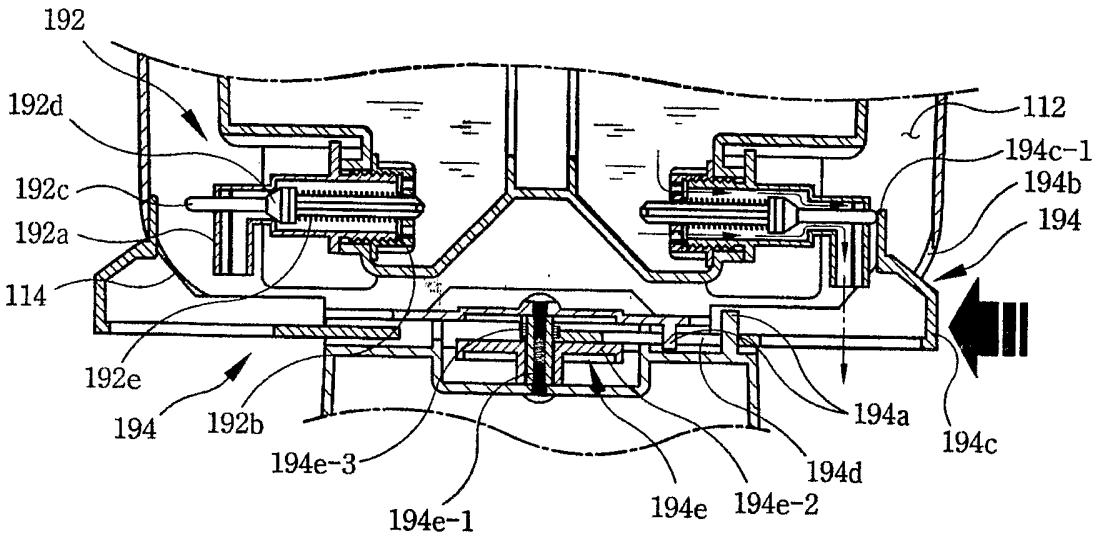
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FIG. 6

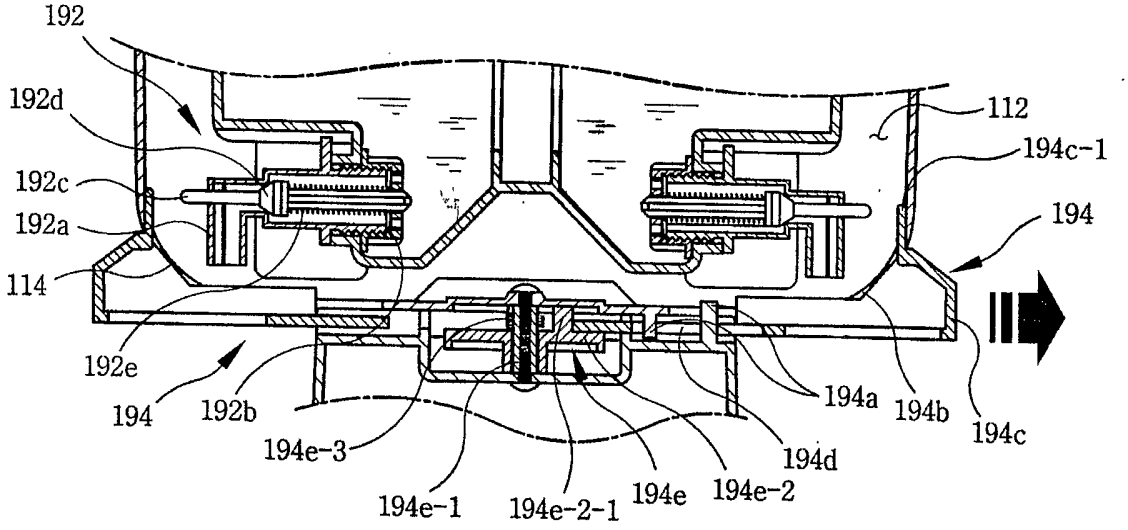
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FIG. 7

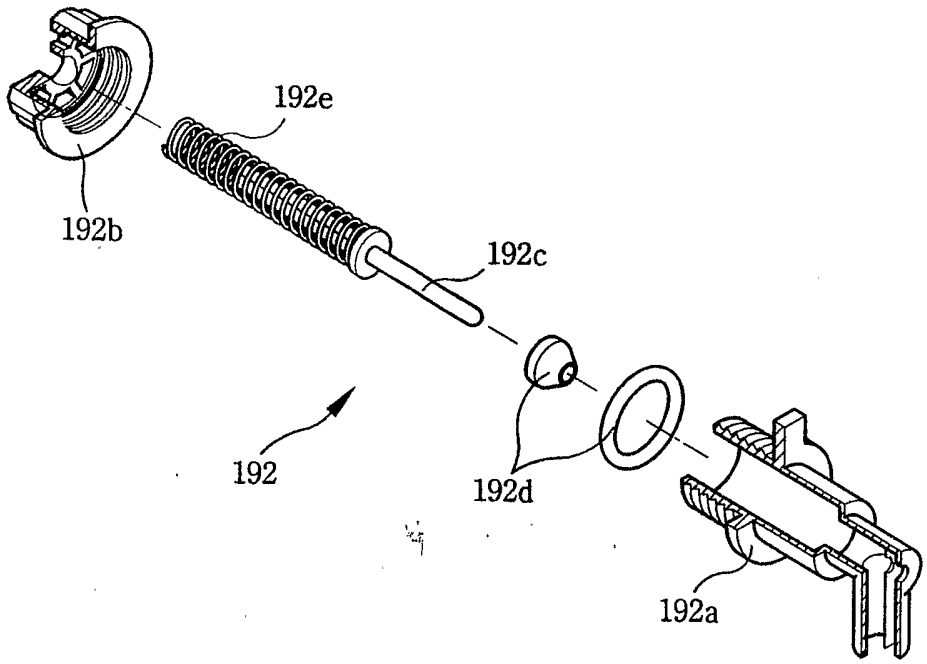
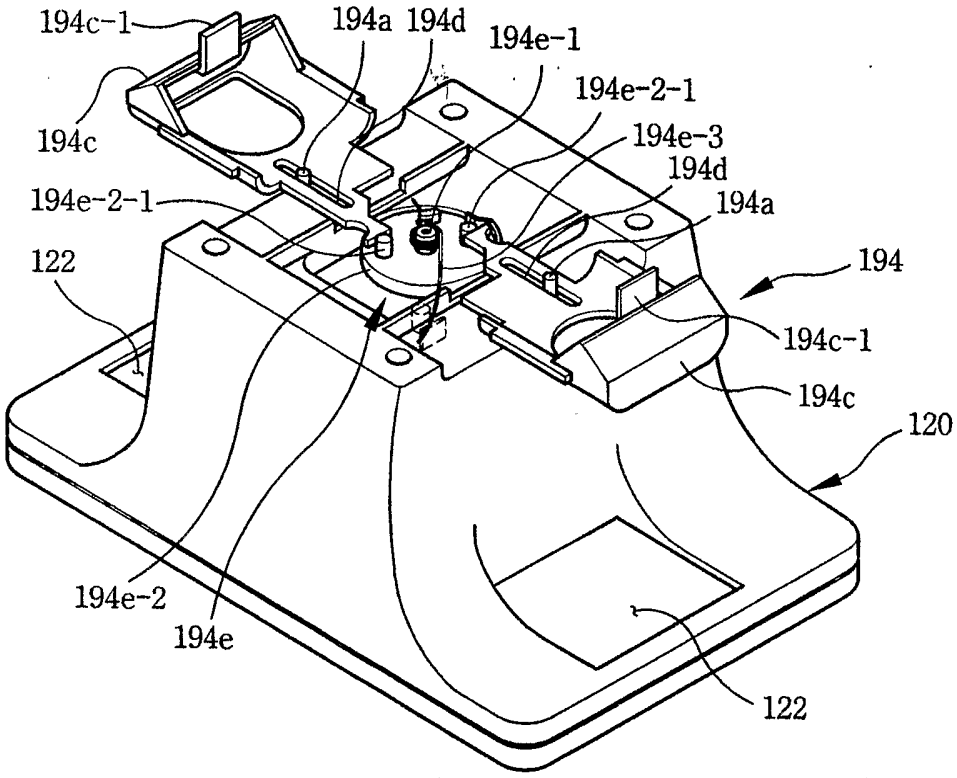


FIG. 8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INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2004/001235

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 C02F 1/461

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)

IPC7 B01D, C02F

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

Korean Patents and applications for inventions since 1975
Korean Utility models and applications for Utility models since 1975

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

eKIPASS, Delphion, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ----- Y	KR 1988-445 Y1 (Lee Bong Sin) 10 March 1988 See the whole document	1, 2, 5, 6 ---- 3, 4
Y	KR 206115 Y1 (Kwon Soon Seon) 1 December 2000 See the whole document	1, 2, 3, 5
Y	KR 190858 Y1 (Hanarum Co.) 1 August 2000 See figure 3	4
Y	JP 14-18438 A (Matsushita Electric Ind. Co., Ltd.) 22 January 2002 See the whole document	1
Y	JP 14-301477 A (Matsushita Electric Ind. Co., Ltd.) 15 October 2002 See the whole document	1
A	US 5510009 A (Miz Co., Ltd.) 23 April 1996 See the whole document	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents.
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"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 SEPTEMBER 2004 (22.09.2004)	**23 SEPTEMBER 2004 (23.09.2004)**

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Telephone No. 82-42-481-8116

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR2004/001235

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