

SPECIFICATION

DRINKING ELECTROLYTIC WATER APPARATUS USING BOTTLED WATER AS RAW WATER

Technical Field

The present invention relates to a drinking electrolytic water apparatus using bottled water as raw water.

Related Art

Conventionally, clean water is served in Japan, and sanitary drinking water is always supplied from a water supply. Therefore, when tap water is made as water of higher taste using a water purifier, it does not cause a filter to bear so much and maintenance cost is not so high.

However, in other countries, there is a city water system, but the water quality is not at a safety level, and the water is not basically suitable for drinking. Therefore, in other countries, if a tap water is filtered using a water purifier to improve the taste, there are drawbacks that exchanging frequency of filter medium becomes high and it is not economical.

For this reason, in other countries, water having high taste whose ingredients are adjusted is bottled in a factory and delivered, and people drink the bottled water using a dispenser under present circumstances.

It is an object of the present invention to provide an apparatus which reforms water quality water whose ingredients are adjusted in a factory at a place where a user drinks the

water, and which produces water having high taste such as water having high reducing character including hydrogen in abundance that is said to have antioxidant effect.

However, a method for electrolyzing pure water and increasing content of hydrogen concentration is known as disclosed in Japanese Patent Application Laid-open No.2010-94622 for example.

In a filter device, a water producing method using an electrolytic cell which does not use a reverse osmosis filter film and which does not have a diaphragm is known as disclosed in Japanese Patent No.4512842 for example.

Summary of the Invention

It is an object of the present invention to provide an apparatus which produces, by using bottled water as raw water, water having high taste such as water having high reducing character including hydrogen that is said to have antioxidant effect.

Means for solving the problem of the invention is a drinking electrolytic water apparatus using bottled water as raw water in which water having drinkable water quality and being suitable for electrolysis is provided in a bottle, the water is pumped into a filter device, the water is filtered, the water is electrolyzed by an electrolytic cell to provide electrolytic treated water, and this water is mixed with raw water and stored.

According to the present invention, there are extremely

advantageous effects that since bottled water is used, exchanging frequency of filter medium is low, it is economical, and concentrated water which is usually disposed is mixed with electrolytic treated water and stored in a water storage tank by adjusting an orientation of a mixing path selection valve in terms of effective use of resources.

Further, there are advantageous effects that water having high taste can be obtained and the water is safe.

Brief Description of Drawings

Fig. 1 is a piping diagram of a drinking electrolytic treated water apparatus which mixes concentrated water into electrolytic treated water according to an embodiment of the present invention;

Fig. 2 is a piping diagram of a drinking electrolytic treated water apparatus which mixes concentrated water into raw water according to another embodiment of the invention;

Fig. 3 is a piping diagram of a drinking electrolytic treated water apparatus using a non-diaphragm electrolytic cell according to another embodiment of the invention; and

Fig. 4 is a piping diagram of a drinking electrolytic treated water apparatus which mixes concentrated water into electrolytic treated water according to another embodiment of the invention.

Preferred Embodiments of the Invention

The present invention provides a drinking electrolytic

water apparatus using bottled water as raw water, including a pump (7) which pumps, into a filter device (2), raw water in a bottle (1) for supplying raw water, an electrolytic device (3) which decomposes the filtered raw water by electrolysis, a mixing path selection valve (4) which mixes, with electrolytic treated water, drainage which is filtered by a filter (2') of the filter device (2) and then discharged, or which mixes the drainage with unfiltered raw water, a water storage tank (5) in which electrolytic treated water is stored and cooled, and an intake valve (6) taking water in the water storage tank.

Embodiments

One embodiment of a drinking electrolytic water apparatus using bottled water as raw water according to the present invention will be described with reference to accompanied drawings. The drinking electrolytic water apparatus includes a pump (7) which pumps, into a filter device (2), raw water in a bottle (1) for supplying raw water, an electrolytic device (3) which decomposes the filtered raw water by electrolysis, a mixing path selection valve (4) which mixes, with electrolytic treated water, drainage which is discharged from the filter device (2), or which mixes the drainage with unfiltered raw water, a water storage tank (5) in which electrolytic treated water is stored and cooled, and an intake valve (6) taking water in the water storage tank.

It is preferable that water quality of bottled water used in the present invention is suitable for drinking and thus, drinkable, and pure water not including impurities is used as

raw water so that an oxidation-reduction value is lowered by electrolysis and drinking water having strong reducing power is produced.

However, since pure water does not have effect for suppressing breeding of bacteria, ingredient having bacteria-killing activity such as hypochlorous acid is added within a drinkable range.

More specifically, raw water has a water quality that satisfies at least one of the following conditions: pH is in a range of 5.8 to 8.6, density of residue on evaporation is 500 mg/L or lower, hardness is 300 mg/L or lower, and density of chloric acid is 0.4 ppm or lower.

As electrolytic means, insoluble metal plates are used as a cathode and a anode, water is made to pass therebetween, and filtered raw water is decomposed by electrolysis, and density of hydrogen included in the raw water is improved.

A method for electrolyzing pure water to increase the density of hydrogen included in the water is known as disclosed in the JP-A No.2010-94622. In the present invention, such an electrolytic cell may be utilized, but when a reverse osmosis filter film is not used in the filter device, it is also possible to electrolyze the water using the Japanese Patent No.4512842 filed by the present applicant as a water producing method and its means by an electrolytic cell which does not have a diaphragm, thereby increasing the density of hydrogen included in electrolytic treated water.

Further, as the filter (2') used in the filter device (2),

it is preferable to use a resin filter for removing foreign bodies mixed in a path, an activated carbon filter for removing chlorine ingredient and odorant ingredient included in raw water, and a reverse osmosis film filter which enhances a pure water degree for effectively lowering oxidation-reduction potential at the time of the electrolysis operation.

When a reverse osmosis filter film is used in the filter device (2), concentrated water which could not pass through the reverse osmosis filter film is discharged. The concentrated water is usually disposed, but it is possible to mix the concentrated water with electrolytic treated water by adjusting an orientation of the mixing path selection valve (4), and to store the water in the water storage tank (5).

A temperature of water at which people feels tasty is lower than a body temperature by 20 to 25°C and therefore, it is preferable that the water storage tank (5) has a function for keeping the water temperature as low as 10 to 16°C.

At that time, since the density of hydrogen included in the water becomes relatively low as compared when concentrated water is not mixed, the oxidation-reduction potential of raw water before electrolytic treatment is about +250 mV, the oxidation-reduction potential of water immediately after electrolytic treatment is about -500 mV, and the oxidation-reduction potential of water after mixing processing is -90 mV.

The oxidation-reduction potential becomes higher than that immediately after the electrolytic treatment, but it is

higher than that of raw water before electrolytic treatment, and since water is changed to water having reduction action, target water is produced.

Further, when stronger reducing power is required, concentrated water can be returned to primary side of the squeeze pump (7) by adjusting the orientation of the mixing path selection valve (4), and thereby water having higher reducing power can be stored in the water storage tank (5).

Although it is not illustrated in the drawings, these apparatuses are accommodated in casings. The orientation of the bottle (1) is opened downwardly as shown in Figs. 1, 2 and 3, but the bottle (1) may be set upwardly and may open upwardly as shown in Fig. 4.

Industrial Applicability

According to the present invention, since a technique of drinking electrolytic water apparatus using bottled water as raw water is established, the technique is carried out and water is sold, there is industrial applicability.

What is claimed is:

1. A drinking electrolytic water apparatus using bottled water as raw water wherein raw water in a bottle (1) which supplies raw water is pumped into a filter device (2) having a filter (2') by a squeeze pump (7), raw water filtered by the filter device (2) is sent to an electrolytic device (3) having electrolytic means, the raw water is electrolyzed, the electrolyzed electrolytic treated water is mixed with concentrated water or the concentrated water is mixed with raw water, by switching a path selection valve (4), the water is stored in a water storage tank (5) which is maintained cool, and the cooled mixed water is supplied by operating an intake valve (6).

2. The drinking electrolytic water apparatus using bottled water as raw water according to claim 1, wherein the electrolytic device (3) is a non-diaphragm electrolytic cell.

3. The drinking electrolytic water apparatus using bottled water as raw water according to claim 1, wherein the raw water has a water quality that satisfies at least one of the following conditions: pH of raw water is in a range of 5.8 to 8.6, density of residue on evaporation is 500 mg/L or lower, hardness is 300 mg/L or lower, and density of chloric acid is 0.4 ppm or lower.