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(54) Pressurized gas-water mixer

(57) A pressurized gas-water mixer, utilized in a multifunctional oxygenated water machine, is disclosed. The pressurized gas-water mixer has a hollow main body which has an inlet for entering the water and the ozone gas and an outlet for flowing out a product. The water and the gas flow into the hollow main body in the same direction to make them come across at a narrow portion so as to form a pressure difference between the both, and then the ozone gas is attracted into the hollow main body when the water flows out so as to produce an attraction. Consequently, the water and the ozone gas can flow quickly and smooth and mix with each other quickly.

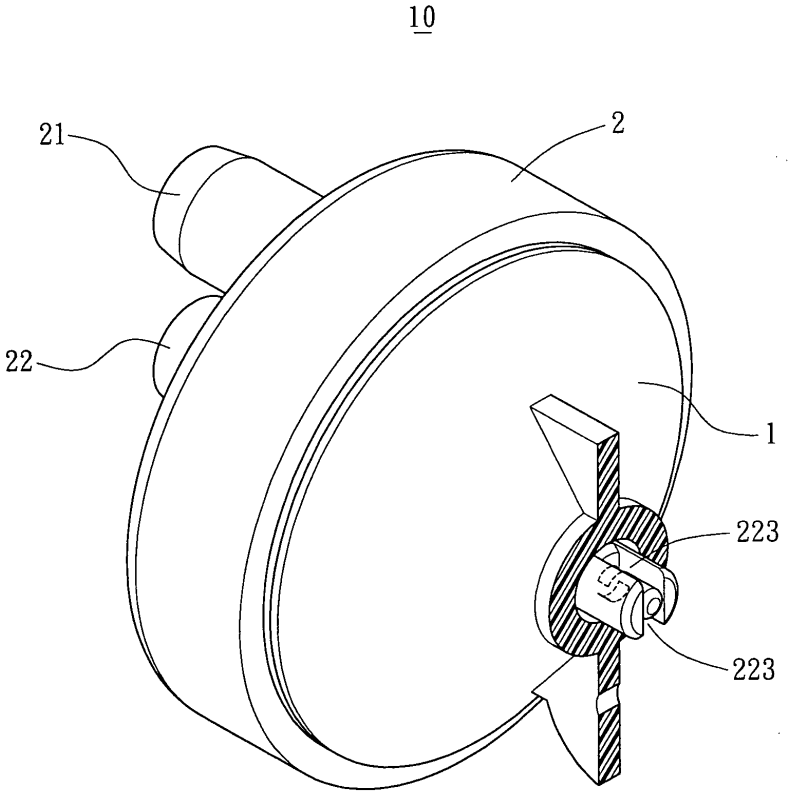

FIG. 2

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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates in general to a pressurized gas-water mixer, and more particularly, to a pressurized gas-water mixer which is utilized in a multi-functional oxygenated water machine in order to mix the water and the ozone quickly to form ozonated water or hydrogen peroxide water.

[0002] Most drinking water machine utilize several pre-filters to remove the solid sediments from the water, then use a reverse osmosis filter to further remove other impurities, and finally use a post-filter to remove any strange odor from the water. Water that has gone through this process becomes safe and potable and is referred to as pure water. However, there is a problem that arises from this kind of filtering. This problem arises because the filtering process skims out both dirty particles and organic materials. The skimmed out organic material gradually accumulates with usage and facilitates the growth of unwanted bacteria in the filters. In order to avoid the health effects of the unwanted bacteria the consumer is forced to change the filters frequently. If the consumer does not change the filters frequently the bacteria density in the water produced will exceed the standard allowed for potable water.

[0003] Furthermore, even though the container is a closed space it is still highly probable that the container will become a virtual nirvana for bacteria. The water delivery outlet closest to the container is the most vulnerable to contamination by bacteria, but this is by no means the only site of potential contamination. This is because once the water delivery outlet closest to the container is contaminated, the bacteria will likely migrate to the rear of the container. There is, therefore, a need to kill the bacteria in the container.

[0004] In order to kill the bacteria in the container a gas-water mixer is installed in a drinking water machine in order to mix the water and the ozone fast to form ozonated water. A convention gas-water mixer is disclosed in U.S. Pat. No. 5,863,128. With reference to Figure 1, the convention gas-water mixer comprises a hollow main body la, a water inlet 11a and a water outlet 12a respectively defined in left and right site of the main body 1a and a gas inlet 13 a defined in a bottom of the main body 1a. The gas inlet 13 a and the water inlet 11 a are formed perpendicularly in order to let the water and the ozone respectively enter into the main body 1a to dissolve each other and form ozonated water.

[0005] When the water and the ozone of the convention gas-water mixer 10a enter into the main body 1a, however, any collision will not be produced between both of them in relation to a distance and a mix area because of the water inlet 11a and the gas inlet 13a is formed perpendicularly. It is difficult to effectively dissolve the water and the ozone to form ozonated water fast. Therefore, because of the longer period of time required by the drinking water machine to form ozonated water, it could not produce ozonated water quickly enough for the consumer; the time required by the conventional ozonated water producer made its use inconvenient to consumers.

BRIEF SUMMARY OF THE INVENTION

[0006] The present invention provides a pressurized gas-water mixer which utilizes a pressure different to dissolve the water and the ozone effectively and quickly so as to form ozonated water or hydrogen peroxide water.

[0007] The pressurized gas-water mixer provided by the present invention includes a hollow main body, an inlet cap with at least one water inlet and at least one gas inlet and an outlet cap with at least one water outlet. An inside of the main body near the water inlet and the water outlet respectively forms a flow guiding board in order to let the water flow quickly and smooth and mix with the ozone quickly.

[0008] An end of the gas inlet inside of the main body provided by the present invention extends to form an extending tube. An end of the extending tube has a taper protrusion which has a through channel formed circularly from an outside of the taper protrusion, and consequently, the ozone gas can directly flow from the through channel to the hollow main body.

[0009] These and other objectives of the present invention will become obvious to those of ordinary skill in the art after reading the following detailed description of preferred embodiments.

[0010] It is to be understood that both the foregoing general description and the following detailed description are exemplary, and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] These as well as other features of the present invention will become more apparent upon reference to the drawings therein:

Figure 1 is a cross-sectional view of a conventional gas-water mixer.

Figure 2 is a perspective view of a pressurized gas-water mixer in accordance with the present invention.

Figure 3 is a cross-sectional view of the pressurized gas-water mixer of Figure 2.

Figure 4 is a partial enlarged view of an A section of the pressurized gas-water mixer of Figure 3.

Figure 5 is a cross-sectional view of the pressurized gas-water mixer along line 5-5 in Figure 4.

Figure 6 is a cross-sectional view of the pressurized gas-water mixer along line 6-6 in Figure 2.

Figure 7 is a partial cross-sectional view of the pressurized gas-water mixer along line 7-7 in Figure 2.

Figure 8 is an operational view of the pressurized gas-water mixer in Figure 2.

Figure 9 is a partial enlarged view of an A section of the pressurized gas-water mixer of Figure 8.

DETAILED DESCRIPTION OF THE INVENTION

[0012] Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the description to refer to the same or like parts.

[0013] Referring to figures 2 and 3, a pressurized gas-water mixer 10 in accordance with the present invention, which is utilized in a multifunctional oxygenated water machine, comprises a hollow main body 1, an inlet cap 2 that comprises at least one water inlet 21 and at least one gas inlet 22 and an outlet cap 3 that comprises at least one water outlet 31. The water inlet 21 and the gas inlet 22 are respectively mounted with a water conveying pipeline and a gas conveying pipeline. The water and the ozone gas enter through the water inlet 21 and the gas inlet 22 into the pressurized gas-water mixer 10 to mix with each other so as to form ozonated water or hydrogen peroxide water.

[0014] With further reference to Figures 3 to 5, the hollow main body 1 preferably is a Venturis, and has an inlet 11 for entering the water and the ozone gas and an outlet 12 for flowing out a product. The hollow main body 1 near the inlet 11 is a narrow portion 13 and diameters of the hollow main body 1 in direction to the outlet 12 are broad by degrees. The inlet cap 2 is mounted with the hollow main body 1 near the inlet 11 and they are preferably threaded with each other. The inlet cap 2 is preferably a converse E shape and has two water inlets 21 formed respectively on an upper and a lower portion of the inlet cap 2 and a gas inlet 22 formed in a center of the inlet cap 2. The gas inlet 22 extends to form an extending tube 221 corresponding to the narrow portion 13 of the hollow main body 1. An end of the extending tube 221 near the narrow portion 13 has a taper protrusion 224 which has a through channel 223 formed circularly from an outside of the taper protrusion 224. The ozone gas directly pass through the through channel 223 and flow into the hollow main body 1, and then, the water and the ozone gas come across in the narrow portion 13 so as to make the hollow main body 1 produce a Venturis effect. Therefore, the water and the ozone gas have a pressure difference at the across site in order to dissolve the water and the ozone effectively and quickly so as to form ozonated water or hydrogen peroxide water.

[0015] Furthermore, the hollow main body 1 comprises a flow guiding board 111 formed in an inner surface near the inlet 11 and the extending tube 221 also comprises a flow guiding board 222 formed circularly from an outer surface of the extending tube 221 (see Figures 2 and 6). The flow guiding board 111 and 222 guides the water to flow forward to the narrow portion 13 quickly.

[0016] Besides, the outlet cap 3 is mounted with the other end of the hollow main body 11 near the outlet 12 and they are preferably threaded with each other. The outlet cap 3 comprises two water outlets 31. In addition, the hollow main body 1 preferably circularly forms a flow guiding board 14 at the inner surface near the outlet 12 (see Figures 2 and 7).

[0017] With reference to Figures 8 and 9, the water (it could be filtered water) and the ozone gas are respectively come from the two water inlet 21 and the gas inlet 22 and flow through into the hollow main body when the pressurized gas-water mixer 10 is desired to produce ozonated water. When the water (see dotted line and black arrowhead in the drawing) go through the flow guiding board 111 and 222 forward into the narrow portion 13 of the hollow main body 1 and the gas (see dotted line and white arrowhead in the drawing) go through the through channel 223 of the taper protrusion 224 forward into the narrow portion 13 of the hollow main body 1, the water and the ozone gas come across at the narrow portion 13 for producing a whirlpool, a rotation and a collision between each other. Therefore, the water and the ozone gas are dissolved with each other to form ozonated water in the hollow main body 1 (see real line and black arrowhead in the drawing). The ozonated water is guiding by the flow guiding board 14 forward to the outlet 3 through the water outlet 31 and storing in the pressurized gas-water mixer 10.

[0018] Thereby, the pressurized gas-water mixer in accordance with the present invention can let the water and the ozone gas parallel in a same direction through the water inlet 21 and the gas inlet 22 into the hollow main body 1, and therefore, the hollow main body 1 forms a Venturis. The Venturis effect of the hollow main body 1 is utilized to form a pressure difference at the across site of the water and the ozone gas, and then the ozone gas is attracted into the hollow main body 1 when the water flows out so as to produce an attraction. Consequently, the water and the ozone gas can flow quickly and smooth and mix with each other quickly.

[0019] While an illustrative and presently preferred embodiment of the invention has been described in detail herein, it is to be understood that the inventive concepts may be otherwise variously embodied and employed and that the appended claims are intended to be construed to include such variations except insofar as limited by the prior art.

Claims

1. A pressurized gas-water mixer for mixing water and ozone gas therein, comprising:

   a hollow main body comprising an inlet for entering the water and the ozone gas and an outlet for flowing out a mixture of the water and the ozone gas, wherein the hollow main body near the inlet has a narrow portion and is divergent

in direction to the outlet;
an inlet cap mounted with the hollow main body near the inlet and comprising at least one water inlet and at least one gas inlet to convey the water and the ozone gas flow into the hollow main body in the same direction, wherein the gas inlet near the narrow portion comprises a taper protrusion which has a through channel formed circularly from one end thereof so that a pressure difference is obtained to well mix the water and the ozone gas at the narrow portion; and
an outlet cap mounted with the hollow main body near the outlet and comprising at least one mixture outlet for flowing out the mixture.

2. The pressurized gas-water mixer of claim 1, wherein the mixture is ozonated water or hydrogen peroxide water.

3. The pressurized gas-water mixer of claim 1, wherein the inlet cap has a converse E-shape and has two water inlets formed respectively on an upper and a lower sides thereof and a gas inlet formed between the water inlets with an extending tube extending toward the narrow portion and the taper protrusion is formed on the extending tube near the narrow portion.

4. The pressurized gas-water mixer of claim 3, wherein the extending tube has an outer surface mounted circularly with a flow guiding board.

5. The pressurized gas-water mixer of claim 1, wherein the inlet of the hollow main body has an inner surface mounted circularly with a flow guiding board.

6. The pressurized gas-water mixer of claim 1, wherein the hollow main body has an inner surface near the inlet mounted circularly with a flow guiding board.

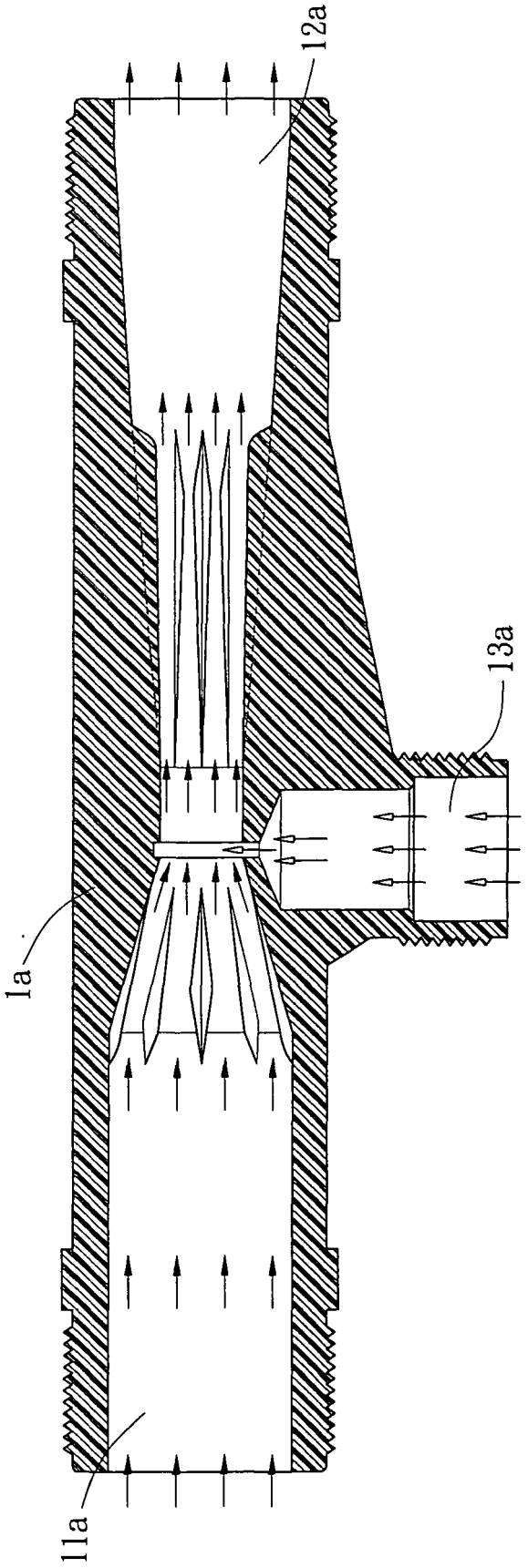

FIG. 1
PRIOR ART

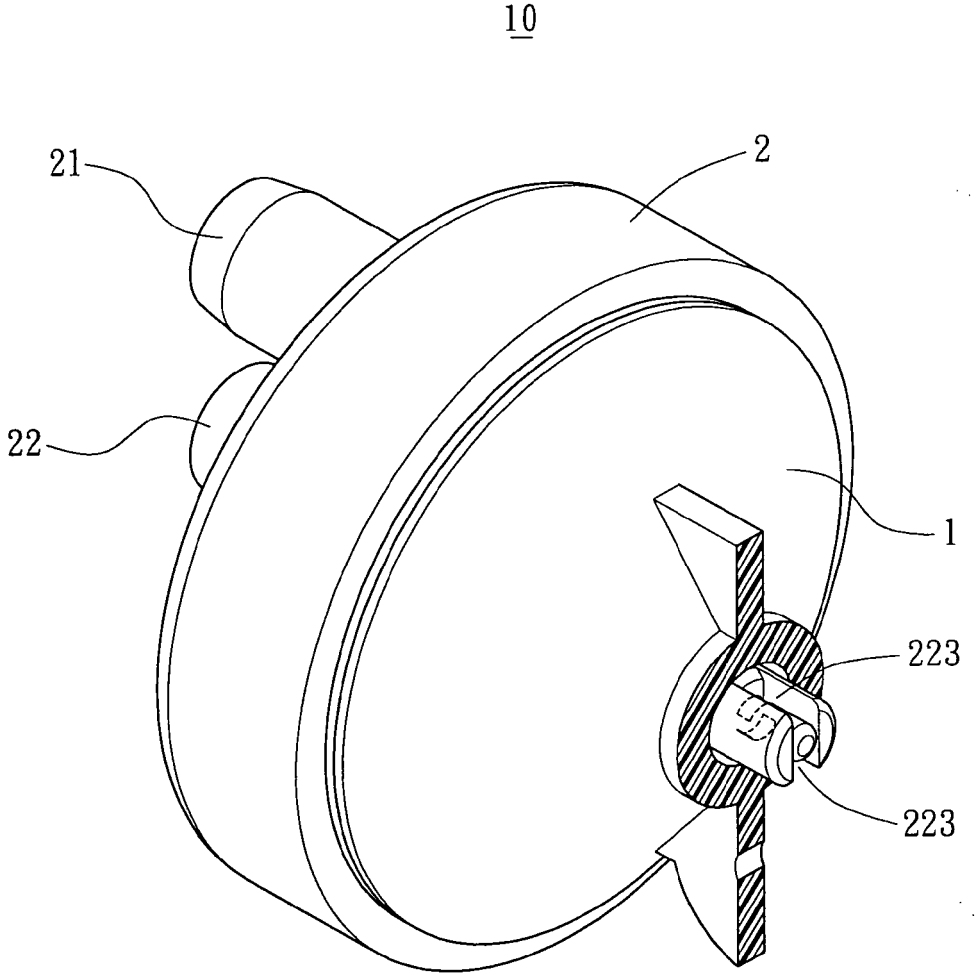

FIG. 2

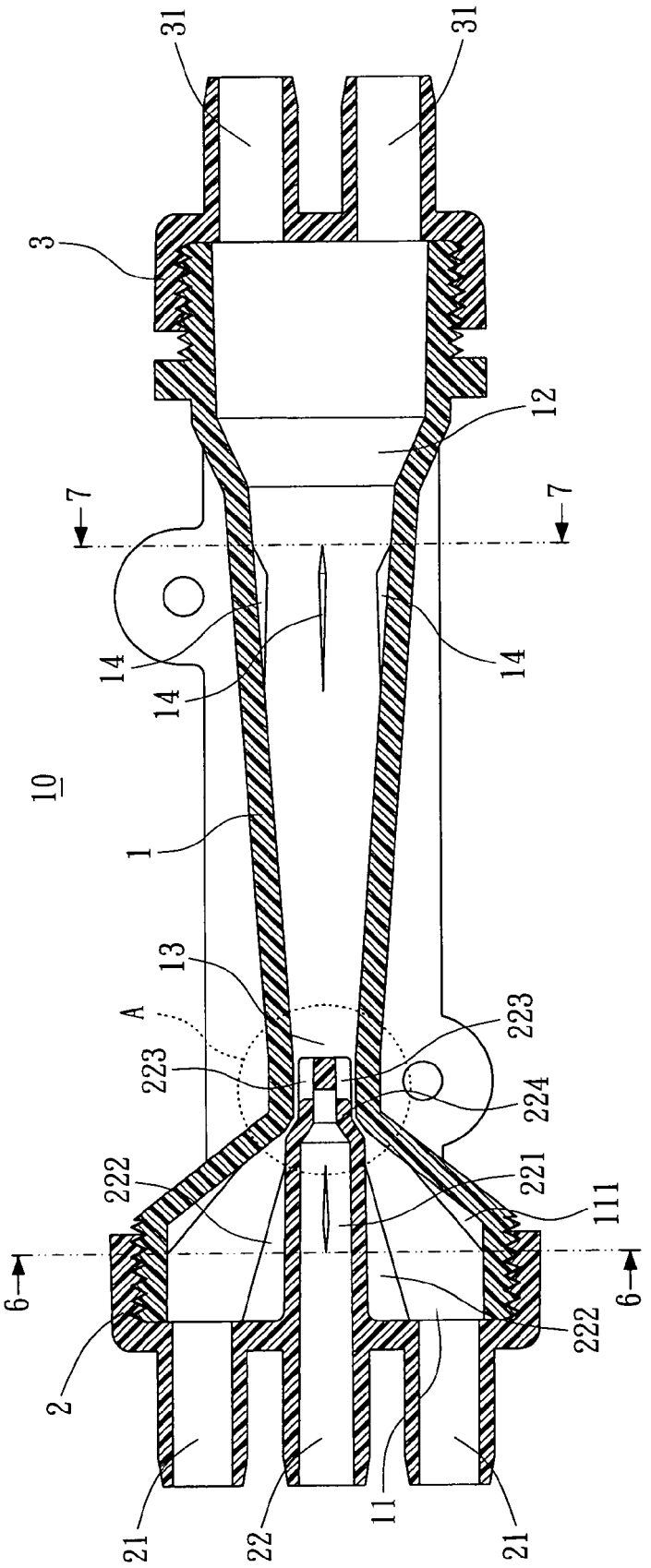
31
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FIG. 3

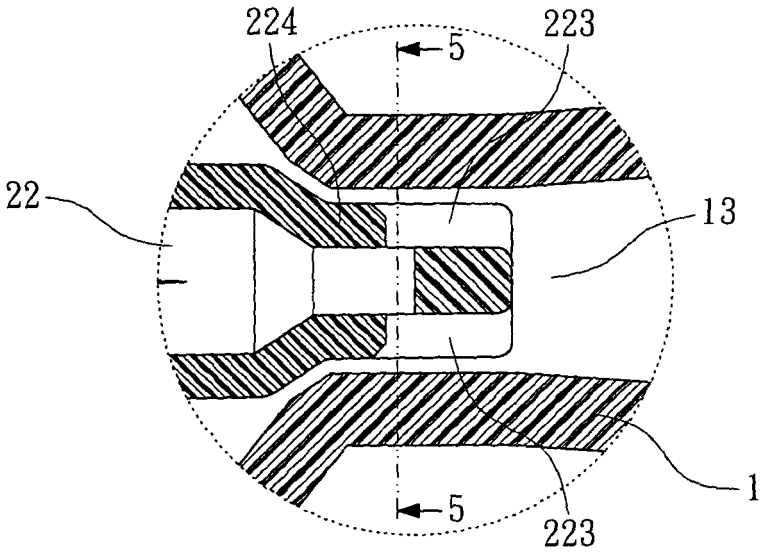

FIG. 4

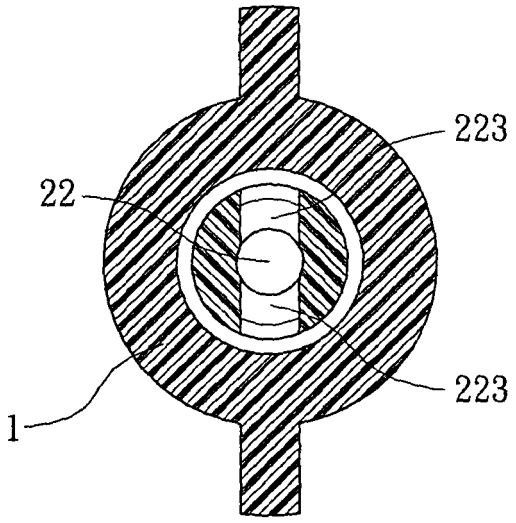

FIG. 5

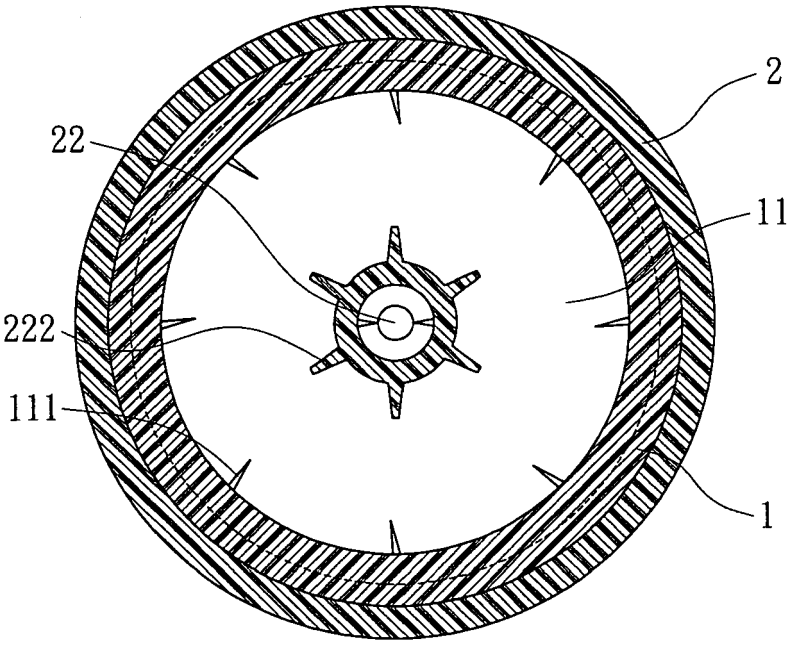

FIG. 6

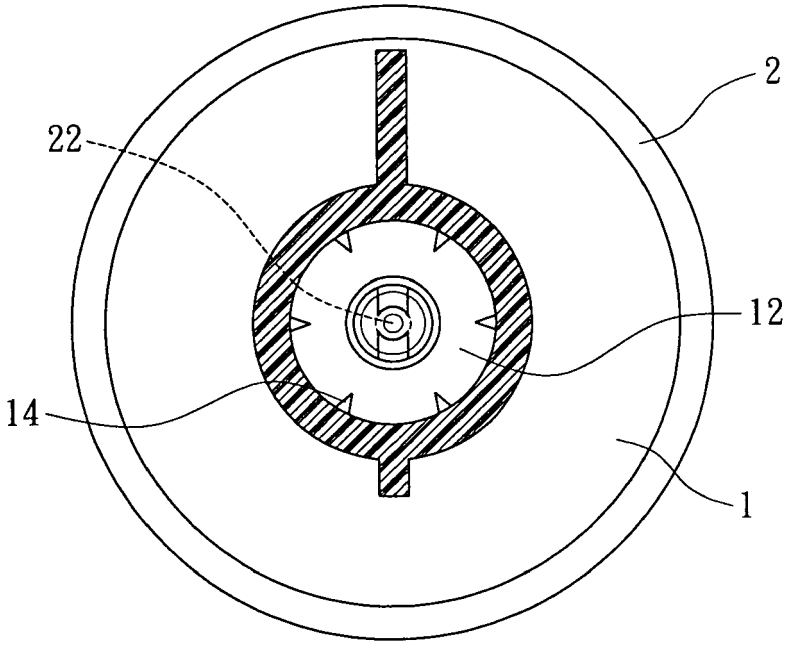

FIG. 7

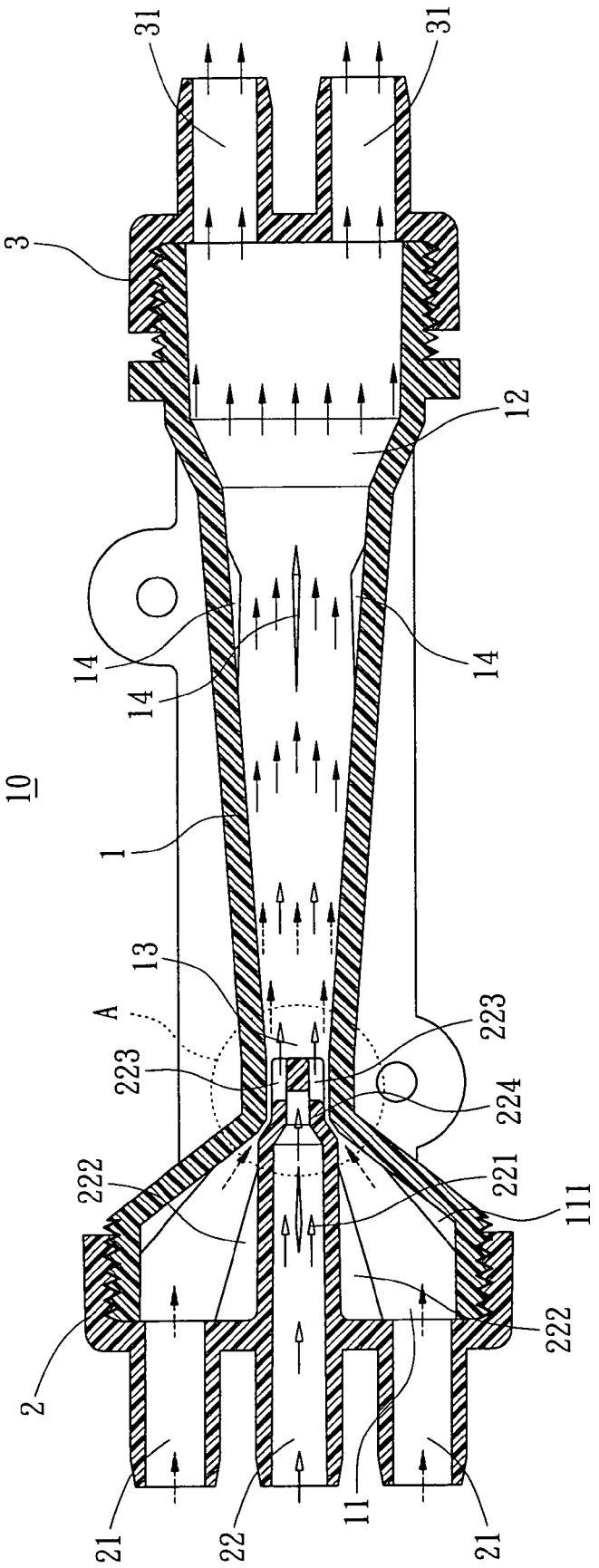

FIG. 8

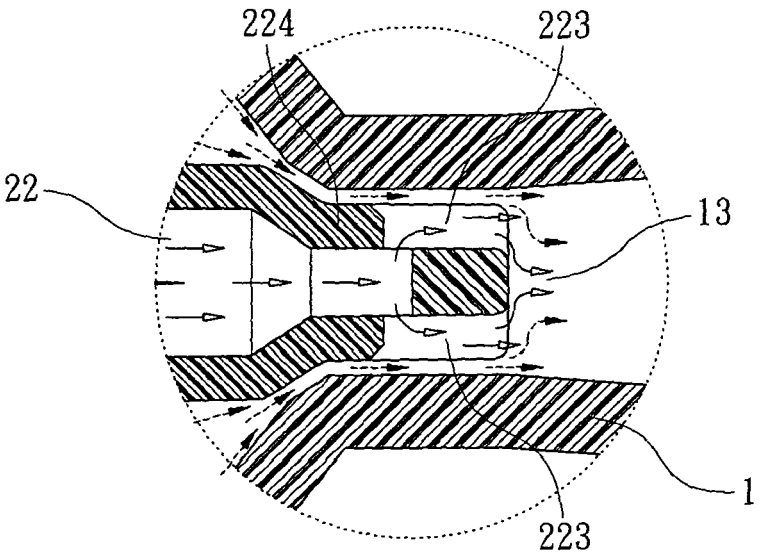

FIG. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 04 02 4300

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	1 March 2005	Muller, G

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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