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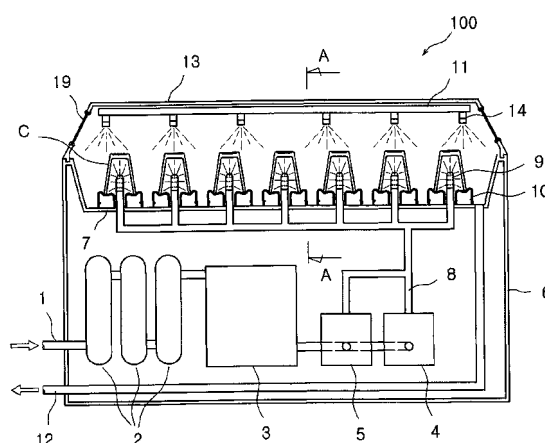
(54) **DEVICE FOR WASHING CUPS**

(57) Disclosed is a cup washing apparatus, and more particularly to a cup washing apparatus, having a structure such that a large number of cups being shelved are first washed with a purified washing water being sprayed under high pressure from both inside the cups and from above, and then dried using purified steam being sprayed under high pressure from both inside the cups and from above, thereby being capable of cleaning the large number of cups simultaneously in a clean and fast mode, thus being applicable to homes and dining rooms to considerably reduce the time and effort required for washing cups while maintaining their sanitary conditions.

According to the present invention, there is provided a cup washing apparatus, comprising a main body which comprises a water supply pipe installed at one side; a plurality of water purifying filters, which are internally connected to the water supply pipe; a washing water tank, which stores water purified in the water purifying filters; a steam generator which converts the washing water in the washing water tank into steam; and a spray pump which sprays under high pressure the steam generated by the steam generator; a stand installed on the upper part of the main body; a plurality of internal face washing nozzles, which, being vertically installed on the stand, are arrayed in multiple rows and columns such that they can be respectively connected to a spray pump and a steam generator via a spray line installed inside the main body; a cup holder which is removably shelved on the stand such that it can be extrapolated around the internal face washing nozzle, respectively; a plurality of external face washing lines, which, being horizontally installed on the upper part of the main body with a predetermined

space therebetween, are installed at regular intervals such that they can be connected to a spray line; a drain pipe, which is installed on one end of the main body such that it can be connected to the stand, and a cover, which is installed on the upper part of the main body such that it can seal the upper part of the main body thereof.

[FIG. 1]



**Description**

[Technical Field]

**[0001]** The present invention relates to a cup washing apparatus, and more particularly to a cup washing apparatus, having a structure such that a large number of cups being shelved are first washed with a purified washing water being sprayed under high pressure from both inside the cups and from above, and then dried using purified steam being sprayed under high pressure from both inside the cups and from above, thereby being capable of cleaning the large number of cups simultaneously in a clean and fast mode, thus being applicable to homes and dining rooms to considerably reduce the time and effort required for washing cups while maintaining their sanitary conditions.

[Background Art]

**[0002]** People generally use cups to drink water or drinks at home or restaurants. These cups are manufactured in various shapes and have a structure where the top portion is in general wider than that of the bottom and a rather long depth. Therefore, it has become more convenient for people to pour water or drinks into a cup and also easier to drink what is contained in such a cup therein.

[Summary of Invention]

[Technical Problem]

**[0003]** However, these cups which are deep inside were washed clean via direct manual wash only due to their rather long internal structure and shape.

**[0004]** Further, a dish washing machine, which is mainly used for washing dishes and the like, could not help much in washing the above types of cups because cups to be washed were either placed upside down or in an upright position inside the dishwashing machine thus either the external surfaces or internal surfaces of the cups were able to be washed.

**[0005]** Accordingly, it usually required an extremely large amount of time and effort to wash many cups with the above types the wash must be resorted to manual wash. In particular, in restaurants with many regular customers this was especially so.

**[0006]** Therefore, there has been an urgent need for the development of an automatic cup washing apparatus which can simultaneously wash a large number of cups thereby reducing the time and effort both at home and restaurants.

**[0007]** In this regard, there have been many attempts to develop various automatic cup washing apparatuses for washing a large number of cups but these conventional apparatuses were mainly utilizing the water flow to wash the cups and thus were not able to wash the inside of the cups cleanly.

**[0008]** Further, the conventional cup washing apparatuses were using unpurified water in washing the cups and thus there was a sanitation problem.

[Technical Solution]

**[0009]** In order to solve the above-mentioned problems, the present invention, as a way to automatically wash a huge number of cups both inside and outside cleanly using purified water thereby reducing the time and efforts required for cup washing while maintaining the sanitary conditions of the cups being washed, provides a cup washing apparatus, comprising a main body which comprises a water supply pipe installed at one side; a plurality of water purifying filters, which are internally connected to the water supply pipe; a washing water tank, which stores water purified by water purifying filters; a steam generator which converts the washing water in the washing water tank into steam; and a spray pump which sprays under high pressure the steam generated by the steam generator; a stand installed on the upper part of the main body; a plurality of internal face washing nozzles, which, being vertically installed on the stand, are arrayed in multiple rows and columns such that they can be respectively connected to a spray pump and a steam generator via a spray line installed inside the main body; a cup holder which is removably shelved on the stand such that it can be extrapolated around the internal face washing nozzle, respectively; a plurality of external face washing lines, which, being horizontally installed on the upper part of the main body with a predetermined space therebetween, are installed at regular intervals such that they can be connected to a spray line; a drain pipe, which is installed on one end of the main body such that it can be connected to the stand, and a cover, which is installed on the upper part of the main body such that it can seal the upper part of the main body thereof.

## [Advantageous Effects of Invention]

**[0010]** The cup washing apparatus of the present invention can wash a plenty of cups automatically both inside and outside cleanly using water purified by water purifying filter, and then sterilizing and drying them by placing them under high temperature steam thereby considerably reducing the time for cleaning cups both at home and restaurants while maintaining the cups in good sanitary conditions.

## [Brief Description of Drawings]

**[0011]** The accompanying drawings, which are included to provide a further understanding of the disclosure and are incorporated in and constitute a part of this application, illustrate embodiments of the invention and together with the description, serve to explain the principle of the invention. In the drawings:

FIG. 1 is a vertical cross sectional view of the present invention.

FIG. 2 is a vertical cross sectional view taken along line "A-A" of FIG. 1.

FIG. 3 is a plan view of the present invention.

FIG. 4 is a plan view of a cup holder of the present invention.

FIG. 5 is a vertical cross sectional view of a cup being shelved on the cup holder of the present invention.

## [Description of Embodiments]

**[0012]** Hereinafter, exemplary technical features of the present invention will be described with reference to the accompanying drawings.

**[0013]** In an embodiment of the present invention, there is provided a cup washing apparatus 100, comprising:

a main body 6; which comprises a water supply pipe 1 installed at one side; a plurality of water purifying filters 2, which are internally connected to the water supply pipe 1; a washing water tank 3, which stores water purified in the water purifying filters 2; a steam generator 4 which converts the washing water in the washing water tank 3 into steam; and a spray pump 5 which sprays under high pressure the steam generated by the steam generator 4;

a shelf 7 installed on the upper part of the main body 6;

a plurality of internal face washing nozzles 9, which, being vertically installed on the shelf 7, are arrayed in multiple rows and columns such that they can be respectively connected to a spray pump 5 and a steam generator 4 via a spray line installed inside the main body 6;

a cup holder 10 which is removably shelved on the shelf 7 such that it can be extrapolated around the internal face washing nozzle 9, respectively;

a plurality of external face washing lines 11, which, being horizontally installed on the upper part of the main body 6 with a predetermined space therebetween, are installed at regular intervals such that they can be connected to a spray line 8;

a drain pipe 12, which is installed on one end of the main body 6 such that it can be connected to the shelf 7, and a cover 13, which is installed on the upper part of the main body 6 such that it can seal the upper part of the main body 6 thereof.

**[0014]** In the cup washing apparatus, beneath the external face washing lines 11 there are provided a plurality of external washing nozzles at regular intervals.

**[0015]** Further, the cup holder 10 comprises an insertion ring 15 which is extrapolated into the internal face washing nozzles 9; a plurality of props 17, which, having a predetermined height and a concave portion 16 on its upper portion thereof, are respectively installed in a radial fashion along the circumference of the insertion ring 15; and a fixed ring 18 which is respectively installed on the other end of each of the props such that it can connect and fix the props.

**[0016]** Here, the cup holder 10 is formed in various sizes so that it can be replaced depending on the size of the cup(C).

**[0017]** In the cover 13, there is provided at least one sight glass 19. In addition, although not shown, there is provided a switch at one end of the main body 6 for controlling washing time and spray pressure, etc.

**[0018]** The cup washing apparatus of the present invention as explained above is an apparatus which can automatically wash cups (C) made of glass or plastic used at home and restaurants by using washing water sprayed under high pressure and then sterilizing and drying them using high pressure steam.

**[0019]** In particular, the cup washing apparatus of the present invention is characterized in that it can wash a large number of cups using purified washing water via single operation and also it can wash both inside and outside of the cups cleanly.

**[0020]** As shown in FIGS. 1-3, the cup washing apparatus of the present invention has a structure where water purifying

filter 2, washing water tank 3, spray pump 5, and steam generator 4 are installed inside the main body 6, where the upper portion of which is sealed by the cover 13; the shelf 7 where cups (C) are shelved is installed on the upper part of the main body 6; a plurality of internal face washing nozzles 9, which are used for sterilizing and drying the internal face of cups (C) using washing water under high pressure and steam under high pressure, are installed along with the cup holder 10, which support cups (C) to a predetermined height, and on the shelf 7; a plurality of external face washing nozzles 14, which are used for sterilizing and drying the external face of cups (C) using washing water under high pressure and steam under high pressure, are installed on the upper part of the main body 6; and water supply pipe 1 and drain pipe 12, which are used respectively for supplying and releasing washing water therethrough, are installed on one end of the main body 6.

**[0021]** That is, the structure of the cup washing apparatus of the present invention is such that both the internal and external surfaces of cups (C), being placed on a predetermined height, are first washed of their internal and external surfaces by using purified washing water sprayed under high pressure, and then sterilized by using purified steam being sprayed under high pressure from both inside and outside of the cups (C).

**[0022]** Therefore, unlike the conventional cup washing apparatuses which rely their washing on the flow of washing water, the cup washing apparatus of the present invention is capable of cleanly washing the internal surface of cups (C) by using the internal surface washing nozzles 9, which are provided in sufficient number corresponding to that of shelved cups (C), and is also capable of cleanly washing the external surface of cups (C) by using the external surface washing nozzles 14.

**[0023]** Further, unlike the conventional cup washing apparatuses which used unpurified washing water, the cup washing apparatus of the present invention uses water which is stepwisely purified using water purifying filter 2 and is therefore capable of more effectively washing the cups (C).

**[0024]** Still further, the cups (C) are sterilized and then dried of their internal and external surfaces by steam being sprayed from both the internal surface washing nozzles 9 and the external surface washing nozzles 14, and therefore the sanitary conditions of the cups (C) can be improved. The detailed steps of the operation of the cup washing apparatus of the present invention are set forth hereunder.

**[0025]** First, prior to the operation of the cup washing apparatus, the upper part of the main body 6 is opened by lifting the cover 13 of the main body 6 and the cups (C) are respectively shelved on the upper portion of the cup holder 10 wherein each of the internal surface washing nozzles 9 is extrapolated on the shelf 7, such that the mouth of each of the cups (C) faces down toward the shelf 7.

**[0026]** Here, considering that there is a concave portion 16 formed on the upper part of the prop 17 of the cup holder 10 which supports each cup to a predetermined height, it is required that the circumference of the cup be positioned on the concave portion 16 thereby preventing the cups from moving around.

**[0027]** The cup holders 10 are prepared in various sizes to meet the cups of various sizes, and thus suitable cup holders may be selected and used depending on the size of cups to be washed.

**[0028]** Then, as the cups (C) are placed on the shelf 7, the cover 13 is closed to seal the upper part of the main body 6, and the switch for controlling the cup washing apparatus provided on one end of the cup washing apparatus is turned on.

**[0029]** Once the cup washing apparatus 100 is operated, the purified washing water in the washing water tank 3 is transported along the spray line 8 by the operation of the spray pump 5, and is sprayed through both the internal surface washing nozzles 9 and the external washing nozzles 14 toward the cups shelved on the shelf 7.

**[0030]** Therefore, both the internal and external surfaces of the cups (C) placed on the cup holders 10 are cleanly washed of their internal and external surfaces by the washing water being sprayed under high pressure. Here, the washing water is sprayed in the form of fine water drops and thus the washing quality can be more improved.

**[0031]** Further, because the washing water is purified by using water purifying filter 2 it helps to better clean the cups (C). Here, the washing water which drops over the shelf 7 after being sprayed toward the cups (P)(C?) can be drained to the outside through the drain pipe 12.

**[0032]** Once the cup washing is completed as described above, the steam being generated by the operation of steam generator 4 is transported along the spray line 8 by the operation of the spray pump 5 thereby being sprayed toward the cups being shelved on the shelf 7 through the respective internal surface washing nozzle 9 and the external washing nozzle 14.

**[0033]** Therefore, the internal and external surfaces of all the cups (C) are sterilized via high pressured steam. Here, all the harmful germs and pathogenic bacteria remaining on the cups (C) can be eliminated thus maintaining the sanitary conditions of the cups (C).

**[0034]** Here, there is provided at least one sight glass 19 in the cover 13 so that the inside of the cup washing apparatus can be observed therethrough enabling visual inspection.

[Reference List]

**[0035]**

|     |                              |      |                              |
|-----|------------------------------|------|------------------------------|
| 1:  | water supply pipe            | 2:   | water purifying filter       |
| 3:  | washing water tank           | 4:   | steam generator              |
| 5:  | spray pump                   | 6:   | main body                    |
| 7:  | shelf                        | 8:   | spray line                   |
| 9:  | internal face washing nozzle | 10:  | cup holder                   |
| 11: | external face washing line   | 12:  | drain pipe                   |
| 13: | cover                        | 14:  | external face washing nozzle |
| 15: | insertion ring               | 16:  | concave portion              |
| 17: | prop                         | 18:  | fixed ring                   |
| 19: | sight glass                  | 100: | cup washing apparatus        |
| C:  | cup                          |      |                              |

## Claims

### 1. A cup washing apparatus, comprising:

a main body 6; which comprises a water supply pipe 1 installed at one side; a plurality of water purifying filters 2, which are internally connected to the water supply pipe 1; a washing water tank 3, which stores water purified in the water purifying filters 2; a steam generator 4 which converts the washing water in the washing water tank 3 into steam; and a spray pump 5 which sprays under high pressure the steam generated by the steam generator 4;

a shelf 7 installed on the upper part of the main body 6;

a plurality of internal face washing nozzles 9, which, being vertically installed on the shelf 7, are arrayed in multiple rows and columns such that they can be respectively connected to a spray pump 5 and a steam generator 4 via a spray line installed inside the main body 6;

a cup holder 10 which is removably shelved on the shelf 7 such that it can be extrapolated around the internal face washing nozzle 9, respectively;

a plurality of external face washing lines 11, which, being horizontally installed on the upper part of the main body 6 with a predetermined space therebetween, are installed at regular intervals such that they can be connected to a spray line 8;

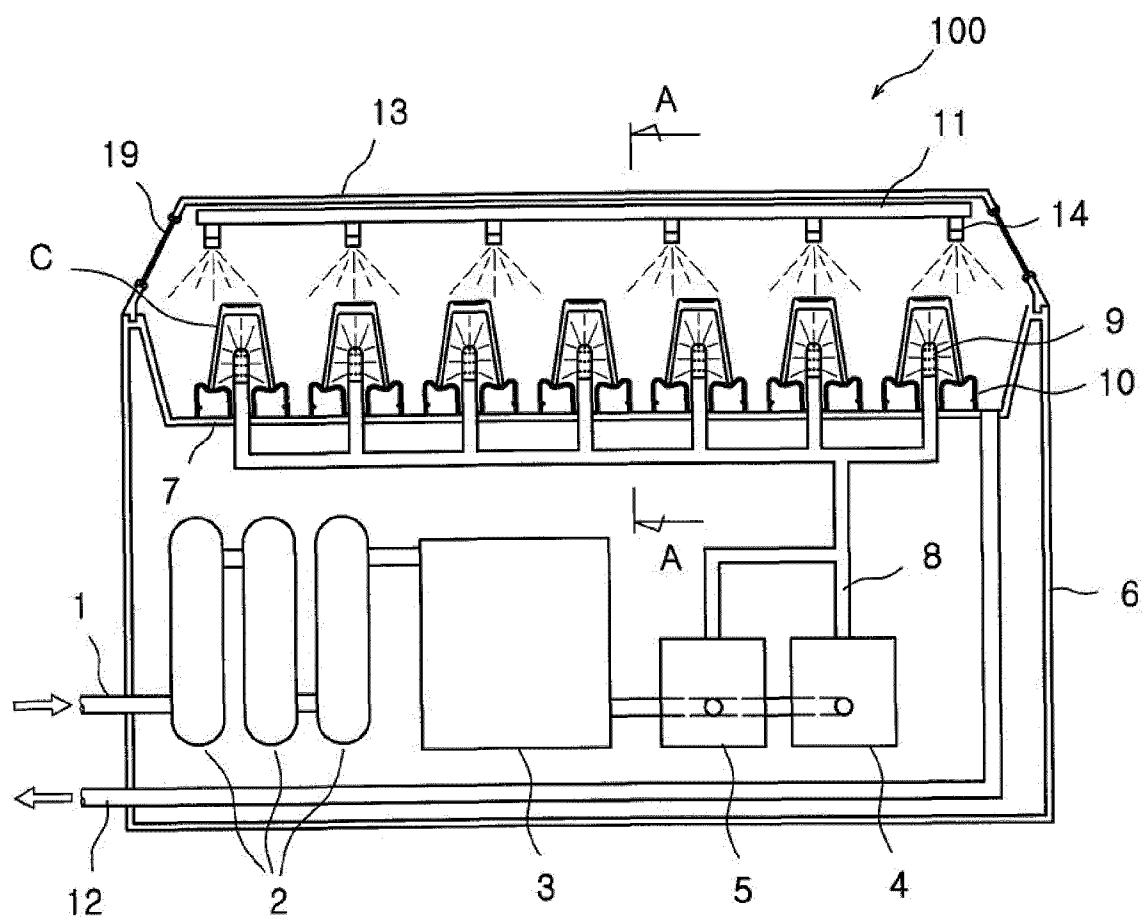
a drain pipe 12, which is installed on one end of the main body 6 such that it can be connected to the shelf 7, and a cover 13, which is installed on the upper part of the main body 6 such that it can seal the upper part of the main body 6 thereof.

### 2. The cup washing apparatus according to claim 1, wherein a plurality of external face washing nozzles 14 are installed underneath the external face washing lines 11 at regular intervals.

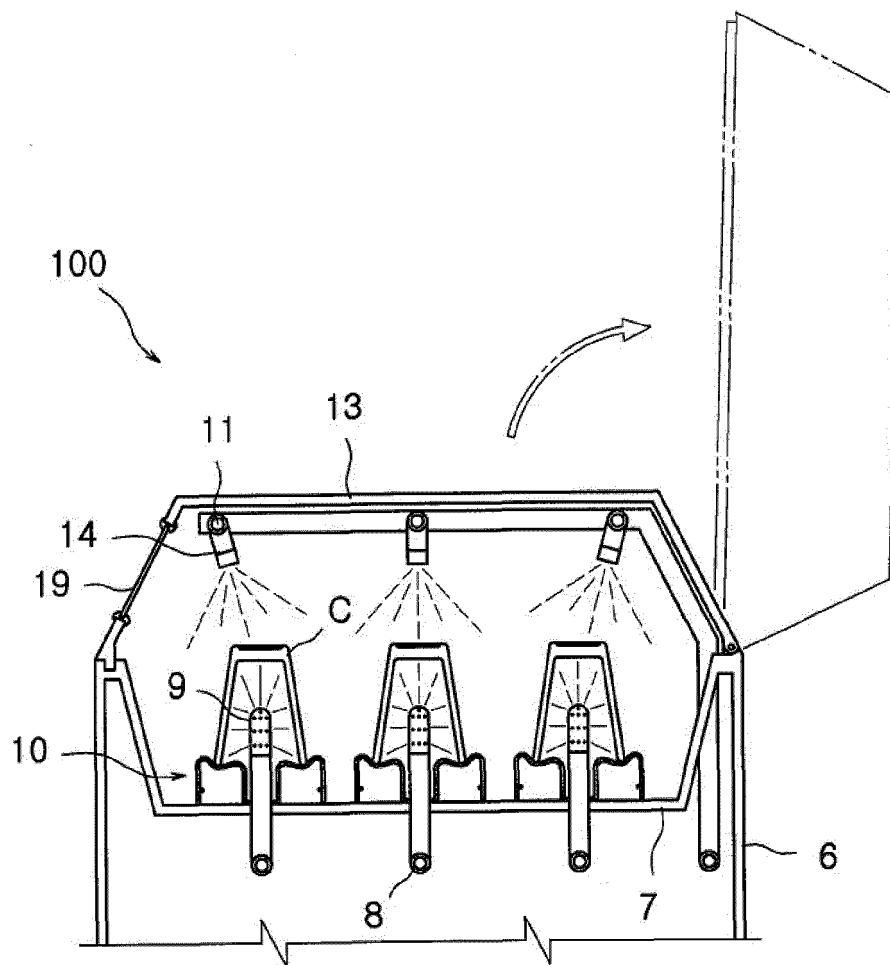
### 3. The cup washing apparatus according to claim 1, wherein the cup holder 10 comprises an insertion ring 15 which is extrapolated into the internal face washing nozzles 9; a plurality of props 17, which, having a predetermined height and a concave portion 16 on its upper portion thereof, are respectively installed in a radial fashion along the circumference of the insertion ring 15; and a fixed ring 18 which is respectively installed on the other end of each of the props such that it can connect and fix the props.

### 4. The cup washing apparatus according to claim 1, wherein at least one sight glass is provided for each cover 13.

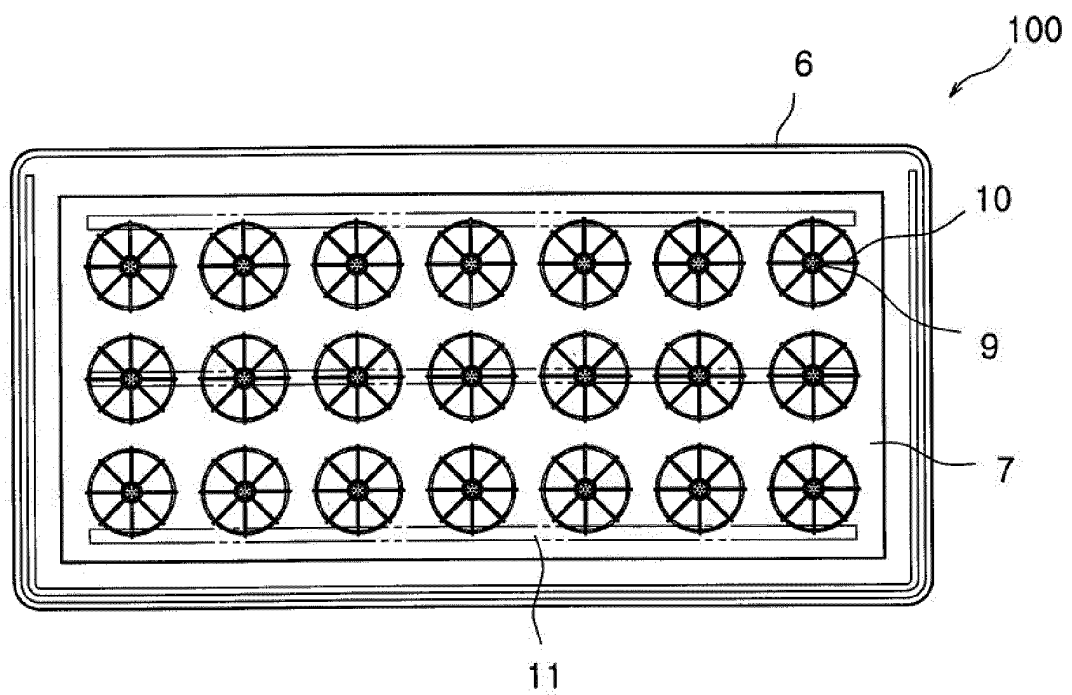
【FIG. 1】



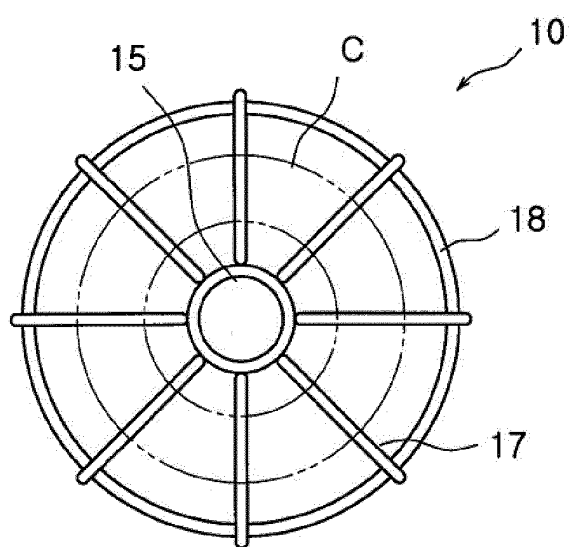
【FIG. 2】



【FIG. 3】



【FIG. 4】



【FIG. 5】

