contact with the treatment agent more efficiently than in the conventional technology; and a filter separation apparatus used for the filter separation method.

SUMMARY OF THE INVENTION

According to an aspect, there is provided a filter separation method for filter-separating an object to be treated, in which: the object to be treated is contacted with a liquid treatment agent; a first filter and a second filter are used; and the second filter exhibits liquid repellency to the liquid treatment agent. The filter separation method includes the steps of: disposing the first filter and the second filter spaced apart from each other by a spacer; and putting a mixture of the object to be treated and the treatment agent onto the first filter from a side opposite to the second filter, separating the object to be treated on the first filter, allowing the treatment agent in the mixture to pass through the first filter and to be retained between the first filter and the second filter due to the liquid repellency of the second filter, without passing through the second filter, wherein the spacer has a ring-shaped rib formed on an upper surface around an opening in a central portion, and wherein the first filter is a hydrophilic filter and the second filter is a hydrophobic filter.

~~In the~~According to another aspect, there is provided a filter separation apparatus ~~of the present invention~~ used for the filter separation method for filter-separating an object to be treated~~as described above~~, comprising: a first contact chamber and a second contact chamber in each of which an object to be treated is ~~brought into contact with a treatment agent are disposed apart from each other by a hydrophilic filter; and the second contact chamber and a filtrate outlet are disposed apart from each other by a~~

~~hydrophobic filter.~~contacted with a treatment agent; a filtrate outlet from which a filtrate made up of the object to be treated and the treatment agent is discharged outside; a hydrophilic filter that separates the first contact chamber and the second contact chamber from each other; and a hydrophobic filter that separates the second contact chamber and the filtrate outlet from each other wherein the second contact chamber is formed by separating the hydrophilic filter and the hydrophobic filter from each other by a spacer, wherein the spacer has a ring-shaped rib formed on an upper surface around an opening in a central portion.

According to embodiments~~With the present invention~~, the filter separation method and the filter separation apparatus for using the same are provided in which, when an object to be treated having been separated by a filter is treated with a treatment agent, the object to be treated can be brought into contact with the treatment agent more efficiently than a conventional technology.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective diagram illustrating a microorganism capturing device as a filter separation apparatus according to an embodiment of the present invention.

FIG. 2A and FIG. 2B are each an exploded perspective diagram illustrating the microorganism capturing device (filter separation apparatus) of FIG. 1 according to the embodiment. FIG. 2A is the exploded perspective diagram as viewed downward from obliquely above. FIG. 2B is the exploded perspective diagram as viewed upward from obliquely below.

FIG. 3 is a perspective diagram for explaining a method of capturing microorganisms using the microorganism capturing device (filter separation apparatus) according to the embodiment.

FIG. 4 is a cross sectional diagram illustrating a state where the microorganism capturing device (filter separation apparatus) of FIG. 1 is mounted on a microorganism counting