

AN APPARATUS FOR FILTERING A LIQUID

Field of the Invention

- 5 The present invention relates to an apparatus for filtering a liquid, specifically, a cartridge used in a liquid filter configured to filter, for example, municipal treated water.

Background

- 10 Water filters currently in the market typically use two different filter cartridges so that the water filters function in a desired manner. The two filter cartridges are, a sediment filter cartridge and a carbon filter cartridge. However, both types of filter cartridges perform different types of filtration. The sediment filter cartridge typically removes suspended solids/particulates/sediment in the water down up to pre-defined micron
- 15 sizes and also enhances the clarity of the water. Alternatively, the carbon filter cartridge typically absorbs chemical impurities, bad taste, odour, colour, organic compounds and chlorine in the water. It is evident that the use of only a single filter cartridge is not desirable.
- 20 In some circumstances, the two types of filter cartridges are deployed together, where the water is channelled to pass through both types of the filter cartridges. However, water passing through the two types of filter cartridges typically encounter issues pertaining to lower water flowrate and pressure output.
- 25 Furthermore, performance of the two types of filter cartridges typically decreases over time as the suspended solids/particulates/sediment tend to remain within the filter cartridges due to difficulties in flushing out the suspended solids/particulates/sediment. This leads to undesirable filtration performance and eventual poor filtration of the water.

It is evident that there are challenges that need to be overcome in relation to limitations of the filter cartridges.

Summary

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There is provided an apparatus for filtering a liquid. The apparatus comprises:

a housing including a plurality of openings;

a sediment filter located along a central axis of the housing; and

a region defined by the housing and the sediment filter, the region including

10 activated carbon granules.

It is preferable that the plurality of openings is located at a majority surface portion of the housing.

15 It is desirable that a fine mesh extends over each of the plurality of openings.

Preferably, the sediment filter is embedded to the housing. Alternatively, the sediment filter is affixed to the housing.

20 It is preferable that the activated carbon granules are coconut based.

The apparatus is preferably used in a liquid filter, and can be subject to backwashing.

The liquid being filtered can be either treated water or untreated water.

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It will be appreciated that the broad forms of the invention and their respective features can be used in conjunction, interchangeably and/or independently, and reference to separate broad forms is not intended to be limiting.

30 **Brief Description of the Drawings**

A non-limiting example of the present invention will now be described with reference to the accompanying drawings, in which:

FIG 1 is a first perspective view of an example of an apparatus for filtering a liquid;

5 FIG 2 is a second perspective view of the apparatus of FIG 1;

FIG 3 is an x-ray view of the apparatus of FIG 1; and

FIG 4 is a cross-sectional view of the apparatus of FIG 1.

Detailed Description

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The present invention provides an apparatus for filtering a liquid, specifically a cartridge for use in an outdoors liquid filter configured for filtering, for example, municipal treated water. The cartridge is configured to enhance flowrate/pressure output across the liquid filter, improve filtration quality and increase life span of the cartridge. In addition, a recovery performance for each cartridge is also enhanced. It should be appreciated that the outdoors liquid filter can also be used indoors if desired. In addition, the cartridge should not be limited for use with only an outdoors liquid filter. The liquid being filtered can be water (treated or untreated), or any other liquid.

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Referring to FIGs 1 to 4, there are shown various views of an example of an apparatus 100 for filtering a liquid. The apparatus 100 is a cartridge used in a liquid filter, and is used in a typical manner in the liquid filter, and thus, a detailed description in relation to how the apparatus 100 is used is not required. The liquid filter can be an outdoors liquid filter.

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The apparatus 100 includes a housing 105 which is substantially cylindrical. The housing 105 includes a plurality of openings 115 located at a majority surface portion 110 of the housing 105. The plurality of openings 115 can also be known as screener holes. The plurality of openings 115 allow higher water volume passing through the apparatus 100 and minimizes the issue of lower flowrate and pressure output across the apparatus 100. In addition, the plurality of openings 115 also increases filtration

throughput while enhancing a recovery performance of the apparatus 100. The enhanced recovery performance is due to an ease in carrying out backwash where sediments/impurities can be dislodged/backwashed easily out from the apparatus 100 through the plurality of openings 115 via reverse flow. Furthermore, although not seen
5 in the FIGs, a fine mesh extends over each of the plurality of openings 115 at an internal surface 120 of the housing 105. The fine mesh is configured to carry out pre-filtration.

The apparatus 100 also includes a sediment filter 125 that is located within the housing
10 105, substantially along a central axis of the housing 105. The sediment filter 125 can be embedded or affixed to the housing 105. Empty space in the housing 105, typically around 70% to 80% of a volume of the housing 105, which is not occupied by the sediment filter 125 is filled with high graded coconut based activated carbon granules 130 (shown to be white space in FIGs 3 and 4) to prevent a cluttered appearance in
15 the FIGs. It should be appreciated that the empty space is defined by the internal surface 120 and the sediment filter 125. It should also be appreciated that the activated carbon granules 130 are present to remove organic chemicals from the liquid passing through the apparatus 100. In addition, the activated carbon granules 130 are prevented from exiting each of the plurality of openings 115 by the fine mesh at the
20 internal surface 120 of the housing 105.

The sediment filter 125 is configured to remove fine sediments/impurities in the liquid that passes through the high graded coconut based activated carbon granules 130. The sediment filter 125 comes with ease and flexibility to ensure sediments/impurities
25 are removable from the apparatus 100. The apparatus 100 allows backwashing to be performed effectively using reverse flow and enhances a recovery rate of the apparatus 100.

When the apparatus 100 is in use, there are benefits such as, for example:

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- higher flowrate and pressure output of the liquid being filtered;

- enhanced recovery performance using backwashing which consequently enhances a life span of the apparatus 100, thereby lowering maintenance costs for users;
- enhanced filtrate quality; and
- 5 - modular replacement of the apparatus 100, whereby whenever multiple apparatus 100 are used, there is the possibility of replacing individual units of the apparatus 100.

Throughout this specification and claims which follow, unless the context requires
10 otherwise, the word “comprise”, and variations such as “comprises” or “comprising”, will be understood to imply the inclusion of a stated integer or group of integers or steps but not the exclusion of any other integer or group of integers.

Persons skilled in the art will appreciate that numerous variations and modifications
15 will become apparent. All such variations and modifications which become apparent to persons skilled in the art, should be considered to fall within the spirit and scope that the invention broadly appearing before described.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An apparatus for filtering a liquid, the apparatus comprising:
a housing including a plurality of openings;
5 a sediment filter located along a central axis of the housing; and
a region defined by the housing and the sediment filter, the region including
activated carbon granules.
2. The apparatus of claim 1, wherein the plurality of openings is located at a
10 majority surface portion of the housing.
3. The apparatus of either claim 1 or 2, wherein a fine mesh extends over each of
the plurality of openings.
- 15 4. The apparatus of any of claims 1 to 3, wherein the sediment filter is embedded
to the housing.
5. The apparatus of any of claims 1 to 3, wherein the sediment filter is affixed to
the housing.
- 20 6. The apparatus of any of claims 1 to 5, wherein the activated carbon granules
are coconut based.
7. The apparatus of any of claims 1 to 6, being used in a liquid filter.
- 25 8. The apparatus of any of claims 1 to 7, being subject to backwashing.
9. The apparatus of any of claims 1 to 8, wherein the liquid is being filtered is
treated water.

10. The apparatus of any of claims 1 to 8, wherein the liquid being filtered is untreated water.