

Biofilter Channel and Method of Purifying Waste Water Systems

The present invention relates to a holistic biofilter modular channel, and in particular to a biofilter for removing toxic waste material from contaminated water as it passes by vortex flow through the biofilter channel, and to a holistic method of purifying water, to allow more vortex flow and oxygenation of the water..

Contaminated water is produced by waste discharge in drainage systems from residences, institutions, hospitals, commercial and industrial establishments, inland aquaculture and the raising of animals. Such contaminated water has disastrous effects on the state of our water ways and oceans. As a result of the awareness of the disastrous results of allowing contaminated water to flow into our river systems and the oceans, many methods of purifying water have been developed, such as reverse osmosis, and clarifiers and the like.

The present seeks to provide an alternative method and apparatus for removing dissolved pollutants and organic and inorganic impurities from waste water by first filter out the gross pollutants, and then passing, using a vortex flow, the filtered waste water through an underground channel having large surface areas of contact with the waste water, using harmonic morphys resonance with aerobic bacteria, to digest the pollutant impurities purifying the waste water.

In one broad form the present invention comprises a harmonic modular structure and biofilter of morphys resonance characteristics, comprising a first filtration unit to remove the gross pollutants, by infiltration, a channel module having, across the module, alternate rows of material of large surface area to volume to create surface area of contact and vortex flows and rows of more open flow, wherein aerobic bacteria colonies feed and reproduce by BOD & COD

and oxygenisation on the surfaces of the rows of large surface area to digest the impurities in the waste water flow along the channel and transforms noxious gases present into pure air.

The material of large surface area to volume can be material having open cells, or being comprised of filaments.

In another broad form the present invention comprises a method of purifying waste water harmonic modular structure and biofilter of morphys resonance characteristics, comprising the steps of:

filtering the waste water to remove the gross pollutants;

then passing the filtered waste water through a channel having, along the channel, alternate rows of material of large surface area to volume to create surface area of contact and vortex flows and rows of more open flow, wherein aerobic bacteria colonies feed and reproduce by BOD & COD and oxygenisation on the surfaces of the rows of large surface area to digest the impurities in the waste water flow along the channel and transforms noxious gases present into pure air.

In another broad form the present invention comprises a method of treating water to remove impurities by first passing water through a filter to remove the gross pollutants, then along a channel which has, across the channel, alternate rows of restricted vortex flow, by resonances morphic vibrator modules having material of large surface area to volume, and rows of more open flow, and causing micro-organisms and aerobic bacteria and morphyc resonance to digest the impurities to clean the moving water.

In one embodiment of the present invention the biofilter has alternate longitudinal sections of the channel where the restricted vortex flow rows and more open flow rows of a section are out of phase with respective restricted flow rows and more open flow rows of adjacent longitudinal sections.

In another embodiment of the present invention the biofilter comprises longitudinal sections of more open flow channels between the longitudinal sections of restricted vortex flow rows and more open flow rows.

In another embodiment of the present invention the biofilter comprise a first channel module having an inlet and outlet and having across the channel module, alternate rows of restricted flow having material of large surface area to volume and rows of more open flow, wherein aerobic bacteria forms on the surfaces of the rows to digest and thus purify the impurities in waste water flow along the channel, wherein the outlet of the first channel module is connected to the inlet of a second channel module, positioned beside the first channel module, and having across the second channel module, alternate rows of restricted flow having material of large surface area to volume and rows of more open flow, wherein aerobic bacteria forms on the surfaces of the rows to digest the impurities in waste water flowing along the channel. This could be repeated with any suitable number of channel modules.

In another embodiment air is introduced to accelerate oxygenisation of the water, being treated, and to maintain the aerobic bacteria.

In another embodiment a manifold can form the base of the alternate flow rows to allow air or oxygen or ozone flow up through the alternate flow rows to eliminate noxious gases and help in water purification. The manifold could operate by means of venturis and by pumps.

The present invention will now be discussed with reference to the enclosed drawings in which:

figure 1 Illustrate, schematically, a partial exploded view of one embodiment of the present invention;

figure 2 illustrates another assembly view of the embodiment in figure 1;

Figure 3 illustrates an end view of the module before the end cap is affixed;

Figure 4 illustrates a cross-sectional view taken along line A-A in figure 3; and

Figure 5 illustrates a cross-sectional view taken along line B-B in figure 3.

One embodiment of the present invention comprises a modular tank (1) comprising perforated end plates (2), two sides perforated side plates (3), two plates (4 & 5) forming the top and bottom, two internal plates (6 & 7) and two porous or perforated contact volumes (8 & 9).

As shown in the drawings the contact volumes (8 & 9) are each sandwiched between an end plate (2) and an internal plate (6 or 7). Each end plate (2) and internal plates (6 & 7) have pins (10), which engage in holes (11) in the side plate (2) and top and bottom plates (4 & 5), to enclose the module (1).

Both the end plates (2) and the internal plates (6 & 7) have a large circular opening (12) which corresponds to the large circular opening (13) in the contact volumes (8 & 9). Each contact volume is porous or perforated to allow water to pass therethrough under a restricted flow, while water flows as a vortex through the circular openings (12 & 13). The contact volume could be a sponge material, perforated plastics, filaments or any combinations thereof.

In use the modules are joined end to end and wrapped in geotextile and a water proof membrane and either buried or enclosed. Waste water, to be treated, is first filter to remove gross pollutants, and then fed along the biofilter.

The contact volumes (8 & 9), contain colonies of aerobic bacteria, which digest the pollutants as they are in contact with the bacteria. Further the water experiences vortex flow as it passes into the unrestricted section (14) of the module (1), aerating the water and oxydizing the pollutants.

It should be obvious that modifications and alteration to the above could be made without departing from the scope or spirit of the present invention.

The Claims defining the invention are as follows

1. A biofilter of morphys resonance characteristics, comprising a first filtration unit to remove the gross pollutants, by infiltration, a channel module having, across the module, alternate rows of material of large surface area to volume to create surface area of contact and vortex flows and rows of more open flow, wherein aerobic bacteria colonies feed and reproduce by BOD & COD and oxygenisation on the surfaces of the rows of large surface area to digest the impurities in the waste water flow along the channel and transforms noxious gases present into pure air.

2. A biofilter according to claim 1, wherein the material of large surface area to volume can be material having open cells, or being comprised of filaments.

3. A biofilter according to claims 1 or 2 comprising alternate longitudinal sections along the channel of the restricted vortex flow rows and more open flow rows of a section are out of phase with respective restricted flow rows and more open flow rows of adjacent longitudinal sections.

4. A biofilter comprising a first channel module having an inlet and outlet and having across the channel module, alternate rows of restricted flow having material of large surface area to volume and rows of more open flow, wherein aerobic bacteria forms on the surfaces of the rows to digest and thus purify the impurities in waste water flow along the channel, wherein the outlet of the first channel module is connected to the inlet of a second channel module, positioned beside the first channel module, and having across the second channel module, alternate rows of restricted flow having material of large surface area to volume

and rows of more open flow, wherein aerobic bacteria forms on the surfaces of the rows to digest the impurities in waste water flowing along the channel.

5, A biofilter according to claim 4 wherein any suitable number of channel modules are connected together.