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**PATENTS ACT, CAP 314**  
(Section 43; Regulation 26 (3))

**NOTICE OF GRANT OF PATENT**

**Volume 5 No: 27**

**TAKE NOTICE** that the following Patent has been granted:

**Title: System and Method for Maintaining Water Quality in Large Water Bodies**

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7. C02F 1/76 (2006.01)

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**Documents/References cited**

**Of Prior Arts:**

- D1 US 2012/024796 A1
- D2 US 2012/024794 A1
- US Patent No 4, 747, 978
- Chinese Patent Publication CN 2292 798

**Effective Date of Grant of Patent:** 18th November, 2020

**Abstract:** Energy saving installation and method for treating large water bodies wherein the method comprises: (a) applying an effective amount of a flocculent to water in the water body to maintain turbidity of the water below 2 NTU, wherein the flocculent flocculates suspended solids in the water into particles that settle to the bottom of the water body. (b) operating a mobile suctioning device to maintain an increase in the black component of the bottom's colour below 30% based on the CMYK scale, wherein the mobile suction device suctions a portion of water from the bottom of the water body containing settled particles, and wherein the device is capable of cleaning at a surface cleaning rate of 10,000m<sup>2</sup>/24 hours; (c) filtering the water suctioned by the mobile suction device and returning the filtered water to the water body, wherein the water suctioned by the mobile suction device does not exceed 10% of the total water volume of the water body in a 24 hour interval; and (d) operating a degreasing system to maintain a surface water layer having less than about 20 mg/L of floating greases, wherein greases from a surface water flow into the degreasing system are removed by a separation unit comprising a degreaser and the treated water is returned to the water body.

## Amended Claims

1. A system for maintaining water quality in a large water body, comprising:

a chemical application system for dosing a flocculant into the water, wherein the chemical application system applies a flocculant to the water in the water body to maintain turbidity of the water below 2 NTU;

a mobile suctioning device capable of moving along the bottom of the water body and suctioning a portion of water from the bottom containing settled solids, wherein the mobile suctioning device is activated before the increase in the bottom's color black component exceeds 30% on a CMYK scale;

a filtration unit in fluid communication with the mobile suctioning unit, wherein the filtration unit receives the portion of water suctioned by the mobile suction unit; and

a degreasing system comprising a separation unit comprising a degreaser and skimmers for providing a surface water flow from the water body to the separation unit, wherein the degreasing system is activated to maintain a surface water layer having less than about 20 mg/L greases; and

one or more return lines for returning filtered water from the filtration unit and the degreasing system to the water body;

2. The system of claim 1, wherein the water body has a surface area of at least 7,000 m<sup>3</sup>.
3. The system of claim 1, wherein the water body comprises an excavated structure having a bottom and walls to contain the water and a non-permeable flexible membrane covering the bottom of the water body, the bottom having a slope that is about 20% or less and the walls having a slope that is greater than about 45%.
4. The system of claim 1, wherein soil forming the bottom of the excavated structure is compacted soil, the soil compacted to at least 80 % of its relative density (RD) if a passage rate of the soil forming the bottom of the excavated structure through No 200 mesh is less than 12%.

5. The system of claim 1, wherein soil forming the bottom of the excavated structure is compacted soil, the soil compacted to at least 85 % of its maximum dry density (MDD) if a passage rate of the soil forming the bottom of the excavated structure through No 200 mesh is greater than 12%.
6. The system of claim 1, wherein the removed top layer of soil is at least 5 cm.
7. The system of claim 1, further comprising a control system that activates the application of additives, the operation of the suctioning device, and the operation of the degreaser system.
8. The system of claim 7, wherein the control system is arranged and configured to receive information regarding water quality parameters, process the information, and activate the chemical activation system, mobile suctioning device, and/or degreasing system to adjust the water quality parameters within their limits.
9. The system of claim 7, wherein the control system is an automated system that processes information.
10. The system of claim 7, wherein the control system may be operated on site.
11. The system of claim 7, wherein the control system may be operated remotely through an internet connection or other information-exchange system.
12. The system of claim 1, wherein the control system receives information regarding the turbidity of the water and activates the flocculant application to adjust the turbidity within a set limit.
13. The system of claim 1, wherein the bottom of the water body has a color that provides a specific coloration to water in the water body.

14. The system of claim 1, wherein the bottom has a white, yellow, or light blue color.
15. The system of claim 1, wherein the degreaser comprises an overflow apparatus for separating oils and greases from the water.
16. The system of claim 1, wherein the degreasing system comprises one or more screens for retaining large debris and a degreaser for separating water from oils and greases through overflow.
17. The system of claim 1, wherein the non-permeable flexible material comprises rubber, plastic, Teflon, low density polyethylene, high density polyethylene, polypropylene, nylon, polystyrene, polycarbonate, polyethylene terephthalate, polyamides, PVC, acrylics, or a combination thereof.
18. The system of claim 1, wherein the non-permeable flexible material has a thickness between about 1.1 mm and about 5 mm.
19. The system of claim 1, wherein the walls are covered with the non-permeable flexible material.
20. The system of claim 1, wherein the suctioning device is supported over brushes to avoid damaging the bottom of the artificially constructed structures.
21. The system of claim 1, wherein the suctioning device is a self-propelled device.
22. The system of claim 1, wherein the suctioning device allows concentration of suctioning power at suction points distributed along the bottom of the device, therefore providing higher suctioning efficiency and avoiding re-suspending the settled materials and debris found on the bottom.

FIGURE 1

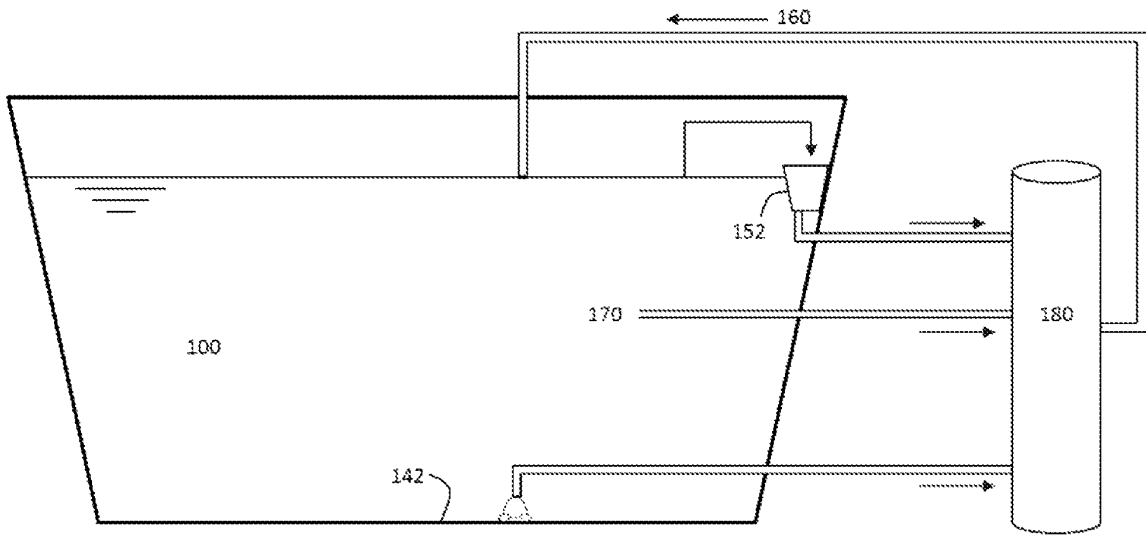


FIGURE 2

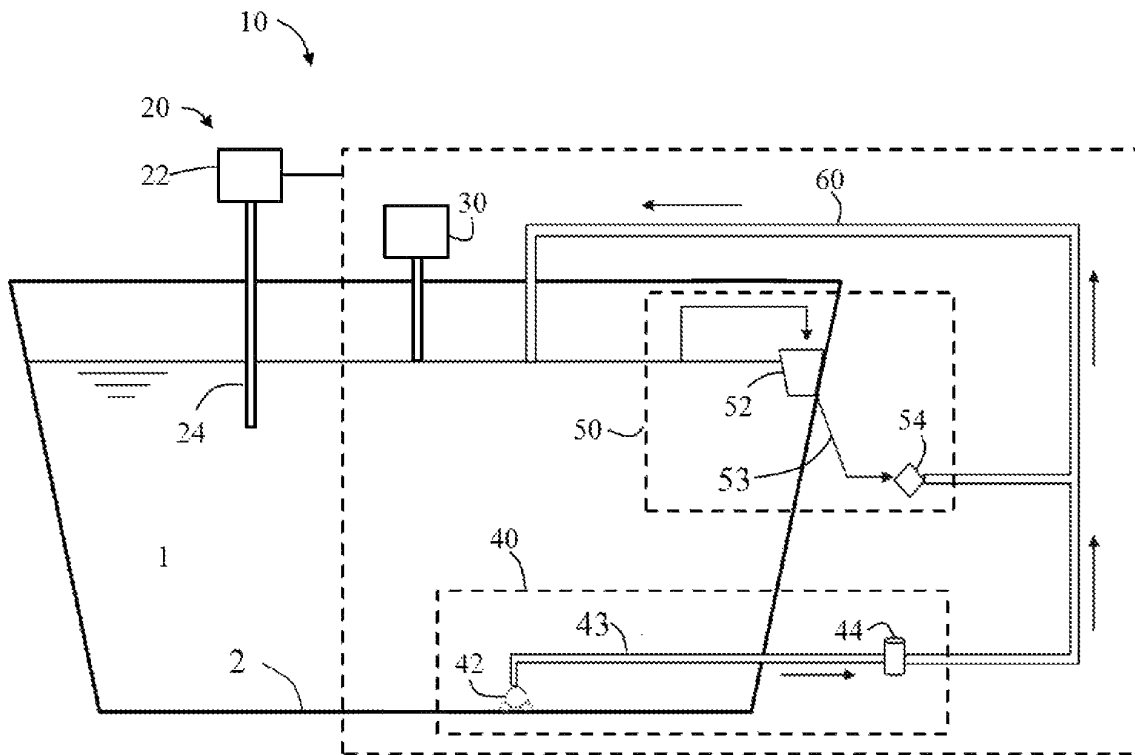
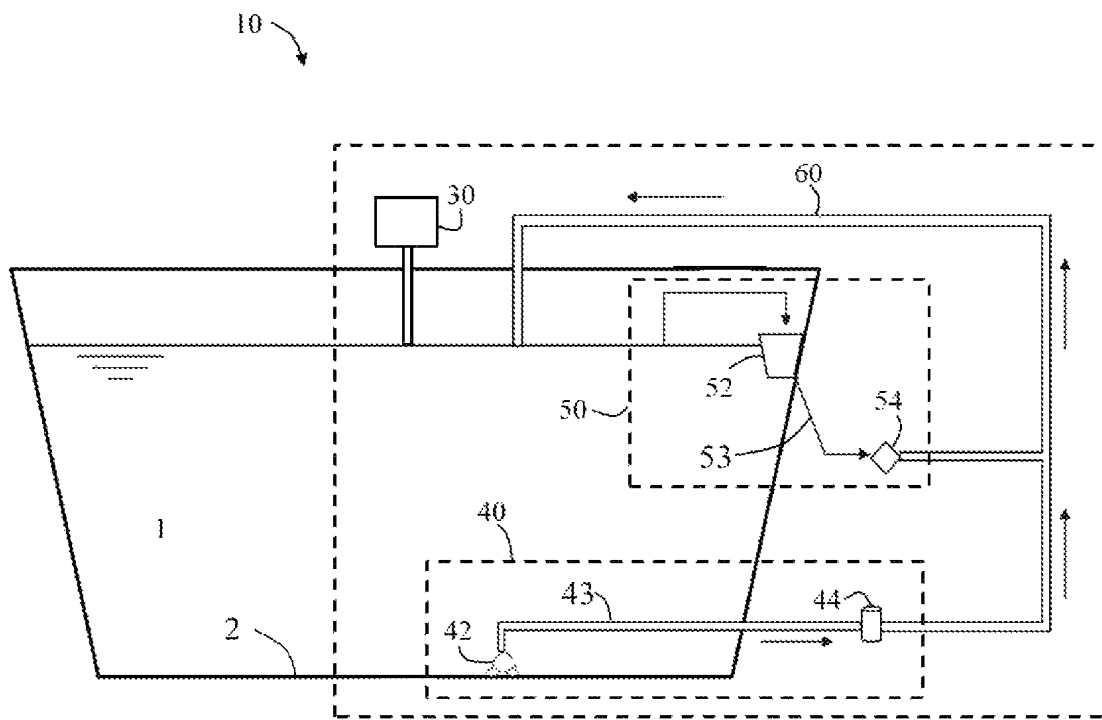
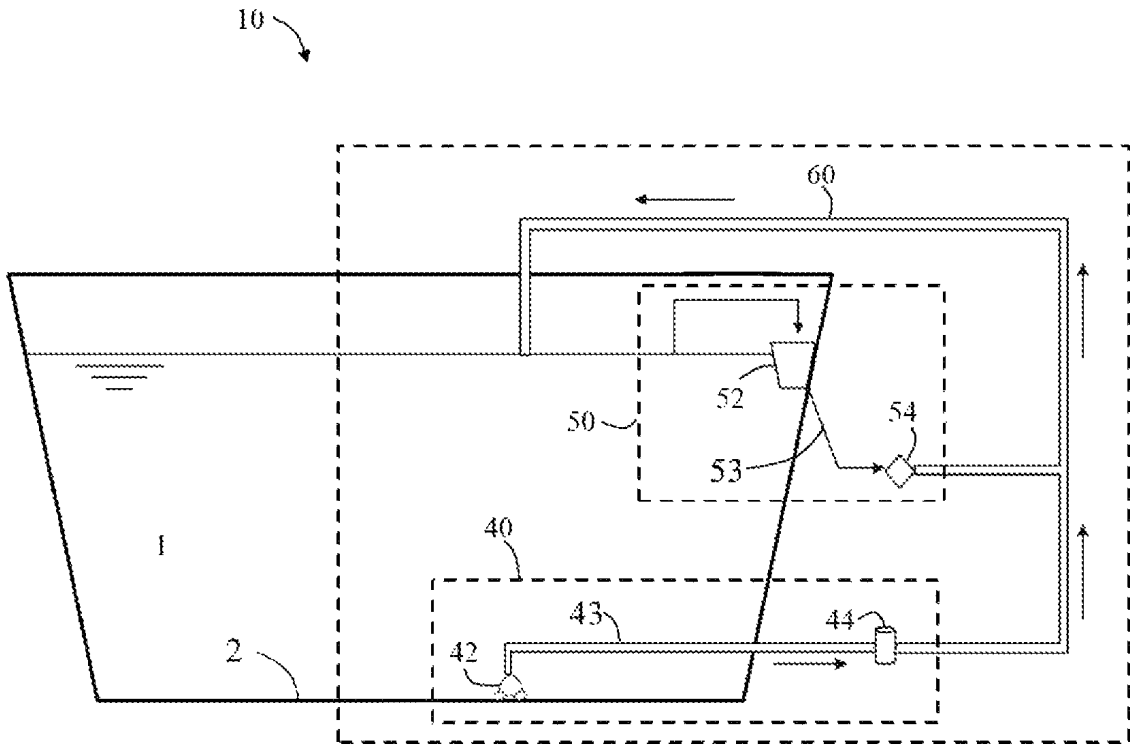


FIGURE 3





**FIGURE 4**



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