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(54) Title: DISSOLVED OZONE FLOATATION EFFLUENT TREATMENT SYSTEM

(57) Abstract: The present disclosure provides a dissolved ozone floatation effluent treatment system for treating and purifying wastewater comprising: (a) a holding tank for receiving a wastewater to be treated; (b) a contact tank having a water inlet for receiving the wastewater and a treated water outlet for outputting treated water, (c) a first re-circulation fluid line connected to the outlet of the contact tank for carrying wastewater from the contact tank; (d) an ozone injection system connected to the first re-circulation fluid line for dissolving a regulated quantity of ozone in the re-circulated stream of wastewater from the contact tank; (e) a second re-circulation fluid line for conducting the wastewater with dissolved ozone to the contact tank; (f) a container for collecting floating sludge from surface of the treated water in the contact tank; (g) an aerating means in fluid communication with the contact tank for receiving and aerating the ozone treated water; and (h) a discharge line extending from the aerating means for discharging clean water. The present disclosure further provides a method for treating and purifying a wastewater stream.



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AMENDED CLAIMS

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I Claim:

1. A dissolved ozone floatation effluent treatment system comprising –
 - a holding tank for receiving wastewater to be treated;
 - a contact tank having an inlet for receiving the wastewater from the holding tank;
 - an ozone injection system configured to receive the wastewater from an outlet of the contact tank through a first re-circulating fluid line, dissolve a regulated quantity of ozone in wastewater present inside the first re-circulated fluid line, and output partially treated wastewater through a second re-circulating fluid line to the contact tank, wherein the partially treated wastewater is wastewater with dissolved ozone;
 - a mean for periodically removing floating sludge from the treated water from surface of the contact tank;
 - an aerating means in fluid communication with the contact tank for receiving and aerating the partially treated water; and
 - a discharge line extending from the aerating means for discharging clean water after the aerating of the partially treated water.
2. The system of claim 1, wherein the system further comprises one or more separator(s) in the contact tank, wherein the one or more separator(s) is high velocity plate separator that provide large separation area in a small volume to separate the wastewater received from the holding tank with the partially treated water.
3. The system of claim 1, wherein the system further comprises an additional contact tank attached with the ozone injection system, and a water recirculation mean that is serially connected to the discharge line of the aerating means to output the aerated water for reprocessing by the ozone injection system to further reduce biochemical oxygen demand (BOD) level and chemical oxygen demand (COD) level.

4. The system of claim 1, wherein the regulated quantity of ozone is dissolved in the water wastewater present inside the first re-circulating fluid line to achieve a concentration of 10 to 30 ppm in the partially treated water.
5. The system of claim 1, wherein the ozone injection system is configured to dissolve the regulated quantity of ozone in the wastewater present inside the first re-circulating fluid line by maintaining contact of ozone with the wastewater present inside the first re-circulating fluid line for an adequate time.
6. The system of claim 1, wherein the system further comprises a means for introducing an ionic polymer into the wastewater stored in the contact tank to flocculate suspended solids in the wastewater.
7. A method for dissolved ozone floatation effluent treatment, the method comprising steps of –
 - receiving wastewater to be treated in a holding tank;
 - receiving the wastewater from the holding tank into a contact tank through an inlet;
 - outputting the wastewater from the contact tank through an outlet;
 - receiving the wastewater from the outlet of the contact tank through a first re-circulating fluid line, at an ozone injection system ;
 - dissolving, by the ozone injection system, a regulated quantity of ozone in wastewater present inside the first re-circulated fluid line;
 - outputting partially treated wastewater through a second re-circulating fluid line to the contact tank, wherein the partially treated wastewater is wastewater with dissolved ozone;
 - periodically removing floating sludge from the treated water from surface of the contact tank;
 - aerating the partially treated water; and
 - discharging clean water after the aerating of the partially treated water.

8. The method of claim 7, wherein the method further comprises steps of recirculating the aerated water for reprocessing by the ozone injection system to further reduce biochemical oxygen demand (BOD) level and chemical oxygen demand (COD) level.
9. The method of claim 7, wherein the regulated quantity of ozone is dissolved in the water wastewater present inside the first re-circulating fluid line to achieve a concentration of 10 to 30 ppm in the partially treated water.
10. The method of claim 7, wherein the ozone injection system is configured to dissolve the regulated quantity of ozone in the wastewater present inside the first re-circulating fluid line by maintaining contact of ozone with the wastewater present inside the first re-circulating fluid line for an adequate time.
11. The method of claim 7, wherein the method further comprises step of introducing an ionic polymer into the wastewater stored in the contact tank to flocculate suspended solids in the wastewater.