Claims

[Claim 1] A water treatment apparatus, comprising:

mixing means having a mixing tank in which water to be treated is mixed with a flocculant added thereto to form flocs;

flocculation means having a cylindrical flocculation tank into which the water to be treated after discharge from the mixing means is introduced, and in which the water to be treated is kept unexposed to an atmosphere, a for-treatment water inlet which introduces the water to be treated into the flocculation tank from a lower part of the flocculation tank in a tangential direction so as to produce a swirl flow, and a for-treatment water outlet, provided in an upper part of the flocculation tank, for discharging the water to be treated from the upper part of the flocculation tank; and

solid-liquid separation means into which the water to be treated after discharge from the flocculation means is introduced from the flocculation means without being exposed to the atmosphere, and in which the water to be treated is subjected to solid-liquid separation,

wherein the solid-liquid separation means is filtration means comprising a filter charged into a filtration tank such that a void content of a filtration portion during water passage becomes 50 to 95%, the filter having string-shaped suspended matter trapping portions.

[Claim 2] The water treatment apparatus according to claim 1, wherein the for-treatment water outlet is provided so as to discharge the water to be treated from the upper part of the flocculation tank in a tangential direction.

[Claim 3] The water treatment apparatus according to claim 1 or 2, wherein the mixing means keeps the water to be treated in such a state as not to be exposed to the atmosphere, the water to be treated is introduced from the mixing means into the flocculation means without being exposed to the atmosphere, and liquid feeding means for feeding the water to be treated is provided in a stage preceding the mixing means.

Claims

[Claim 1]

A water treatment apparatus, comprising:

mixing means in which water to be treated is mixed with a flocculant added thereto to form flocs;

flocculation means having a cylindrical flocculation tank into which the water to be treated after discharge from the mixing means is introduced, and in which the water to be treated is kept unexposed to an atmosphere, a for-treatment water inlet which introduces the water to be treated into the flocculation tank from a lower part of the flocculation tank in a tangential direction so as to produce a swirl flow, and a for-treatment water outlet, provided in an upper part of the flocculation tank, for discharging the water to be treated from the upper part of the flocculation tank; and

solid-liquid separation means into which the water to be treated after discharge from the flocculation means is introduced from the flocculation means without being exposed to the atmosphere, and in which the water to be treated is subjected to solid-liquid separation,

wherein the solid-liquid separation means is filtration means comprising a filter charged into a filtration tank such that a void content of a filtration portion during water passage is 50 to 95%, the filter having string-shaped suspended matter trapping portions, and percent variation in volume of the filtration portion is 10% or less,

wherein the filter comprises a core material connected to both ends in the direction of water passage of the filtration tank,

the mixing means maintains the water to be treated in a state in which the water is not exposed to the atmosphere,

the water to be treated is introduced from the mixing means into the flocculation means without being exposed to the atmosphere, and

liquid feeding means for feeding the water to be treated is provided in a stage preceding the mixing means.

[Claim 2]

The water treatment apparatus according to claim 1, wherein the for-treatment water outlet is provided so as to discharge the water

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to be treated from the upper part of the flocculation tank in a tangential direction.

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