must also be modified over time, and modified intensity entails that the speed of the liquid flow is effected.

The changing speed of the liquid flow may be compensated by revising the operational speed of the flow generating machine, however, this demands for the speed of the liquid flow being monitored by means of expensive speed sensors that are susceptible to disturbances and require regular maintenance.

Object of the disclosure

The present disclosure aims at improving previously known methods for controlling treatment plants with the object of reducing the costs for the operation of the treatment plant and thereby providing an improved method for controlling a treatment plant suitable for treatment of liquid. A basic object of the disclosure is to provide an improved method of initially defined type, which entail that a constant speed of the liquid flow can be achieved without the need for external speed sensors. External speed sensors suffer from the drawbacks that they are expensive and require monitoring and maintenance as they are susceptible to disturbances and thereby risk to provide incorrect information.

In one aspect, there is provided a method for controlling a plant for treatment of waste water, wherein the plant comprises:

- a basin constituted by a circulation channel configured to house a liquid,
- at least one flow generating machine constituted by a submergible mixer machine and arranged in the basin and configured to generate a liquid flow along the circulation channel, wherein the operational speed N of the flow generating machine (6) is higher than a predetermined lowest allowable operational speed Nmin, preventing solid matter from accumulating on the bottom of the basin (2), and is lower than a predetermined highest allowable operational speed Nmax, preventing the flow generating machine (6) from being overloaded,
- at least one equipment that is arranged in the basin and that effects the momentum of the liquid flowing in the basin, and
- a control unit that is operatively connected to said at least one flow generating machine,

the method being **characterized** by the steps of:

- in the control unit storing a predetermined relationship between the operational speed N of the flow generating machine and an operational parameter P from which the torque M of the flow generating machine may be derived, which relationship depends on a predetermined liquid flow speed V in the basin at the flow generating machine,
- determining the operational speed N of the flow generating machine,
- from the determined operational speed N determining a set value of the operational parameter P of the flow generating machine based on said relationship between the operational speed N of the flow generating machine and the operational parameter P of the flow generating machine,
- by means of the control unit determining a real value of the operational parameter P of the flow generating machine, and
- by means of the control unit adjusting the operational speed N of the flow generating machine if the real value of the operational parameter P of the flow generating machine is different than the set value of the operational parameter P of the flow generating machine.

In another aspect, there is provided a plant for treatment of waste water, comprising:
- a basin constituted by a circulation channel configured to house a liquid,
- at least one flow generating machine constituted by a submergible mixer machine and arranged in the basin and configured to generate a liquid flow along the circulation channel, wherein the operational speed N of the flow generating machine (6) is higher than a predetermined lowest allowable operational speed Nmin, preventing solid matter from accumulating on the bottom of the basin (2), and is lower than a predetermined highest allowable operational speed Nmax, preventing the flow generating machine (6) from being overloaded,
- at least one equipment that is arranged in the basin and that effects the momentum of the liquid flowing in the basin, and
- a control unit that is operatively connected to said at least one flow generating machine,

characterized in that the control unit comprises a

Claims

1. A method for controlling a plant for treatment of waste water, wherein the plant (1) comprises:
- a basin (2) constituted by a circulation channel configured to house a liquid,
- at least one flow generating machine (6) constituted by a submergible mixer machine and arranged in the basin (2) and configured to generate a liquid flow along the circulation channel, wherein the operational speed N of the flow generating machine (6) is higher than a predetermined lowest allowable operational speed Nmin, preventing solid matter from accumulating on the bottom of the basin (2), and is lower than a predetermined highest allowable operational speed Nmax, preventing the flow generating machine (6) from being overloaded,
- at least one equipment (7) that is arranged in the basin (2) and that effects the momentum of the liquid flowing in the basin, and
- a control unit (8) that is operatively connected to said at least one flow generating machine (6),
the method being **characterized** by the steps of:
- in the control unit (8) storing a predetermined relationship between the operational speed N of the flow generating machine (6) and an operational parameter P from which the torque M of the flow generating machine (6) may be derived, which relationship depends on a predetermined liquid flow speed V in the basin (2) at the flow generating machine (6),
- determining the operational speed N of the flow generating machine (6),
- from the determined operational speed N determining a set value of the operational parameter P of the flow generating machine (6) based on said relationship between the operational speed N of the flow generating machine (6) and the operational parameter P of the flow generating machine (6),
- by means of the control unit (8) determining a real value of the operational parameter P of the flow generating machine (6), and
- by means of the control unit (8) adjusting the operational speed N of the flow generating machine (6) if the real value of the operational parameter P of the flow generating

machine (6) is different than the set value of the operational parameter P of the flow generating machine (6).

2. The method according to claim 1, wherein the plant (1) is constituted by a treatment plant for treatment of liquid such as waste water.

3. The method according to any of claims 1-2, wherein the operational parameter P is constituted by the torque M of the flow generating machine (6).

4. The method according to any of claims 1-2, wherein the operational parameter P is constituted by the current I consumed by the flow generating machine (6).

5. The method according to any of claims 1-4, wherein the operational speed N of the flow generating machine (6) shall be increased if the true value of the operational parameter P of the flow generating machine (6) is greater than the set value of the operational parameter P of the flow generating machine (6).

6. The method according to any of claims 1-5, wherein the operational speed N of the flow generating machine (6) shall be decreased if the true value of the operational parameter P of the flow generating machine (6) is less than the set value of the operational parameter P of the flow generating machine (6).

7. The method according to any of claims 1-6, wherein said at least one equipment (7) is constituted by a mechanical surface aerator.

8. The method according to claim 7, wherein the mechanical surface aerator comprises a horizontal rotational axis.

9. The method according to claim 7, wherein the mechanical surface aerator comprises a vertical rotational axis.

10. The method according to any of claims 1-6, wherein said at least one equipment (7) is constituted by an aeration sector arranged at the bottom of the basin (2).

11. A plant for treatment of waste water, comprising:
- a basin (2) constituted by a circulation channel configured to house a liquid,
- at least one flow generating machine (6) constituted by a submergible mixer machine and arranged in the basin (2) and configured to generate a liquid flow along the circulation channel, wherein the operational speed N of the flow generating machine (6) is higher than a predetermined lowest allowable operational speed Nmin, preventing solid matter from accumulating on the bottom of the basin (2), and is lower than a predetermined highest allowable operational speed Nmax, preventing the flow generating machine (6) from being overloaded,
- at least one equipment (7) that is arranged in the basin (2) and that effects the momentum of the liquid flowing in the basin, and
- a control unit (8) that is operatively connected to said at least one flow generating machine (6),
characterized in that the control unit (8) comprises a predetermined relationship between the operational speed N of the flow generating machine (6) and an operational parameter P from which the torque M of the flow generating machine (6) may be derived, which relationship depends on a predetermined liquid flow speed V in the basin (2) at the flow generating machine (6), the control unit (8) being configured to determine from a given operational speed N a set value of the operational parameter P of the flow generating machine (6) based on said relationship between the operational speed N of the flow generating machine (6) and the operational parameter P of the flow generating

machine (6), determine a real value of the operational parameter P of the flow generating machine (6), and adjust the operational speed N of the flow generating machine (6) if the real value of the operational parameter P of the flow generating machine (6) is different than the set value of the operational parameter P of the flow generating machine (6).