process, and may be executed before or after the first solid matter separation process and the second solid matter separation process.

[0062] Next, in the wastewater treatment process, the first solid matter, the second solid matter, and the third solid matter are subjected to wastewater treatment.

[0063] Thus in the present aspect, the second solid matter is separated from the second organic wastewater by the second solid-liquid separation device. Moreover, the third solid matter is flocculated and separated from the third organic wastewater by the third solid-liquid separation device.

[0064] This means that in the present aspect, the addition amount of the flocculation agent to be added to the third organic wastewater in the second solid matter separation process can be set according to the oil content concentration, the wastewater volume, the wastewater frequency, and the like of the third organic wastewater.

[0065] Thus in the present aspect, the addition amount of the flocculation agent to be added to the third organic wastewater can be better optimized than cases in which a mixed wastewater of the second organic wastewater and the third organic wastewater is subjected to solid-liquid separation by a single solid-liquid separation device.

[0066] A wastewater treatment method according to a twelfth aspect is the wastewater treatment method according to the tenth aspect or the eleventh aspect, wherein an oil content concentration of the third organic wastewater is higher than an oil content concentration of the second organic wastewater.

[0067] In the wastewater treatment method according to the twelfth aspect, the oil content concentration of the third organic wastewater is higher than the oil content concentration of the second organic wastewater. In such cases, the necessity of flocculation processing readily differs between the second organic wastewater and the third organic wastewater.

[0068] Moreover, even in cases in which flocculation processing is needed for both the second organic wastewater and the third organic wastewater, a large difference readily arises between the required addition amount of flocculation agent to be added to the second organic wastewater and the required addition amount of flocculation agent to be added to the third organic wastewater.

[0069] The present aspect is particularly effective in such cases. Namely, in the present aspect the second solid matter is separated from the second organic wastewater by the second solid-liquid separation device, and the third solid matter is separated from the third organic wastewater by the third solid-liquid separation device.

[0076] An issue here is that the second solid matter and the third solid matter would be mixed together in cases in which a mixed wastewater resulting from mixing the second organic wastewater and the third organic wastewater together is subjected to solid-liquid separation in a single solid-liquid separation device. This would mean that it would be difficult to measure the respective quantities of the second solid matter and the third solid matter to be methane fermented.

[0077] Moreover, in cases in which the generation frequencies of the second organic wastewater and the third organic wastewater are different, the proportions of the second solid matter and the third solid matter in the mixture vary depending on the timing a sample is taken from the mixture of the second solid matter and the third solid matter. Due to the loss-on-ignition and the normal hexane extract concentration of the mixture of the second solid matter and the third solid matter also changing according to this variance, the loss-on-ignition and the normal hexane extract concentration of the mixture would be difficult to analyze with good accuracy.

[0078] In contrast thereto, in the present aspect these quantities can be measured separately for the first solid matter, the second solid matter, and the third solid matter to be methane fermented. Moreover, in the present aspect the loss-on-ignition and the normal hexane extract concentration in the first solid matter, the second solid matter, and the third solid matter can be analyzed separately from samples respectively taken from the first solid matter, the second solid matter, and the third solid matter.

[0079] This means that in the present aspect, the addition amounts of the additive to be added to the first solid matter, the second solid matter, and the third solid matter can be computed with high accuracy even in cases in which the generation frequencies are different between the second organic wastewater and the third organic wastewater. This means that in the present aspect, the oil content concentration of the fermentation feedstock can be more reliably kept at the specific value or lower.

[0080] The technology disclosed herein enables an optimization of an addition amount of flocculation agent.

BRIEF DESCRIPTION OF DRAWINGS

[0081] Fig. 1 is a system configuration diagram illustrating a wastewater treatment system according to a first exemplary embodiment.

Fig. 2 is a system configuration diagram illustrating a wastewater treatment system according to a second exemplary embodiment.

[0088] Note that the disposer 20 is not limited to being a sink in a kitchen of a restaurant or bar, and may be installed below a sink of a house. Moreover, at least one of the disposer 20 is sufficient. Moreover, the disposer 20 is an example of a crusher.

[0089] First Solid-liquid Separation Device

The first solid-liquid separation device 30 is, for example, a screen type solid-liquid separation device that separates first solid matter from the first organic wastewater. The first solid-liquid separation device 30 includes a separation tank 32. The first wastewater pipe 22 is connected to the separation tank 32. The first organic wastewater is supplied from the disposer 20 into the separation tank 32 through the first wastewater pipe 22. A screen 34 is installed inside the separation tank 32.

[0090] The screen 34 is, for example, formed in a slit shape or a mesh shape. The screen 34 partitions the inside of the separation tank 32. The first organic wastewater passes through the screen 34. The first organic wastewater is accordingly separated into the first solid matter having a size not less than a specific value at which size it becomes unable to pass through the screen 34, and into second organic wastewater containing a liquid and second solid matter having a size less than a specific value at which size it becomes able to pass through the screen 34.

[0091] Note that the second organic wastewater is wastewater resulting from removing the first solid matter from the first organic wastewater (disposer wastewater).

[0092] A feedstock tank 112 of a wastewater treatment device 110, described later, is connected to the separation tank 32 through a first distribution pipe 40. A pump 42 such as a slurry pump or the like, is provided to the first distribution pipe 40. The first solid matter inside the separation tank 32 is supplied into the feedstock tank 112 through the first distribution pipe 40 by actuation of the pump 42.

[0093] A flocculation reaction tank 52 of a second solid-liquid separation device 50, described later, is connected to the separation tank 32 through a distribution pipe 44. A pump 46 such as a slurry pump or the like, is provided to the distribution pipe 44. Second organic wastewater inside the separation tank 32 is supplied into the flocculation reaction tank 52 through the distribution pipe 44 by actuation of the pump 46.

[0094] Second Solid-liquid Separation Device

The second solid-liquid separation device 50 is, for example, configured by a screen type solid-liquid separation device that flocculates and separates second solid matter from the second organic wastewater. The second solid-liquid separation device 50 includes the flocculation reaction tank 52 and a separation tank 54.

[0122] Moreover, the second solid-liquid separation device 50 flocculates and separates the second solid matter from the second organic wastewater. The third solid-liquid separation device 80 flocculates and separates the third solid matter from the third organic wastewater.

[0123] In this manner, the present exemplary embodiment flocculates and separates the second solid matter from the second organic wastewater using the second solid-liquid separation device 50. This means that in the present exemplary embodiment, the addition amount of flocculation agent to be added to the second organic wastewater can be set for the flocculation reaction tank 52 of the second solid-liquid separation device 50 based on the oil content concentration, wastewater volume, wastewater frequency, and the like of the second organic wastewater.

[0124] Moreover, in the present exemplary embodiment, the third solid matter is flocculated and separated from the third organic wastewater by the third solid-liquid separation device 80. This means that in the present exemplary embodiment, the addition amount of flocculation agent to be added to the third organic wastewater can be set for the flocculation reaction tank 82 of the third solid-liquid separation device 80 based on the oil content concentration, wastewater volume, wastewater frequency, and the like of the third organic wastewater.

[0125] This means that in the present exemplary embodiment, a better optimization can be achieved for the addition amount of the flocculation agent to be added to the second organic wastewater and the third organic wastewater than cases in which mixed wastewater resulting from mixing the second organic wastewater with the third organic wastewater is subjected to solid-liquid separation by a single solid-liquid separation device.

[0126] Moreover, the oil content concentration of the third organic wastewater is higher than the oil content concentration of the second organic wastewater. The present exemplary embodiment is particularly effective in such cases. In cases in which the oil content concentration of the third organic wastewater is higher than the oil content concentration of the second organic wastewater, a large difference readily arises between the required addition amount of flocculation agent to be added to the second organic wastewater and the required addition amount of flocculation agent to be added to the third organic wastewater.

[0127] Moreover, the wastewater treatment device 110 includes the methane fermentation tank 120. The methane fermentation tank 120 causes methane fermentation to occur using the first solid matter, the second solid matter, and the third solid matter as a fermentation feedstock. The organic matter in the fermentation feedstock is broken down (rendered harmless) thereby.

[0128] Moreover, the wastewater treatment device 110 includes the feedstock tank 112 that holds the first solid matter, the second solid matter, and the third solid matter. The fermentation feedstock is supplied from the feedstock tank 112 into the methane fermentation tank 120.

[0129] Holding the fermentation feedstock in the feedstock tank 112 in this manner enables a constant volume of fermentation feedstock to be supplied continuously from the feedstock tank 112 into the methane fermentation tank 120. This thereby enables the fermentation efficiency of the fermentation feedstock in the methane fermentation tank 120 to be raised.

[0130] Furthermore, the third solid matter is supplied into the feedstock tank 112 from the holding tank 100. Holding the third solid matter in the holding tank 100 in this manner enables a constant volume of the third solid matter to be supplied continuously from the holding tank 100 into the feedstock tank 112. This thereby enables the fermentation efficiency of the fermentation feedstock in the methane fermentation tank 120 to be raised.

[0131] Modified Examples of First Exemplary Embodiment

In the exemplary embodiment described above the oil content concentration of the second organic wastewater is higher than the oil content concentration of the first organic wastewater. However, the oil content concentration of the second organic wastewater may be the same as the oil content concentration of the first organic wastewater, and may be lower than the oil content concentration of the first organic wastewater.

[0132] Moreover, in the first exemplary embodiment described above the wastewater treatment device 110 is configured by a bio treatment device. However, the wastewater treatment device 110 is not limited to being a bio treatment device, and may be a mechanical treatment device.

[0133] Second Exemplary Embodiment

Next, description follows regarding a second exemplary embodiment. Note that the same reference numerals are appended in the second exemplary embodiment to members and the like having the same configuration to those of the first exemplary embodiment, and explanation thereof will be omitted as appropriate.

[0134] Wastewater Treatment Device

Fig. 2 illustrates a wastewater treatment system 140 according to a second exemplary embodiment. The wastewater treatment device 110 of the wastewater treatment system 140 includes a methane fermentation tank 120. The methane fermentation tank 120 causes methane fermentation to occur with a first solid matter, a second solid matter, a third solid