visually observed in a microscope field of view using a hemocytometer.

[0140]

(Experimental Result)

FIG. 11 is a diagram showing measurement results of the number of living cells in Example 1 in which the batch culture is performed.

In FIG. 11, the horizontal axis represents a culture time [day], and the vertical axis represents the measured number of living cells [$\times 10^{6}$ cells/mL]. A plot of ○ indicates a measurement result obtained by a related-art method in an off-line manner that performs sampling. A plot of Δ indicates a measurement result obtained by a related-art method in an in-line manner that estimates the number of cells from the measured capacitance. A plot of ■ indicates a measurement result according to Example 1 in which the measurement of the amount of suspensoids and the measurement of the capacitance of the cell suspension were performed and the calculation was performed based on the model equations.

[0141]

FIG. 12 is a diagram showing a deviation of the measurement results in Example 1 from those obtained by a method in the related art.

FIG. 12 shows a comparison between a measurement

concentration of 2.7 mg/L, and a pH of 7.2. A circulation rate of the culture solution to the cell separation device 4 was 10 mL/min, and a perfusion rate was set at 1 vvd (30 mL/h) by supplying a fresh medium.

[0148]

During the perfusion culture, the number of living cells was measured by the calculation device 6, and bleeding through the extraction pipe 7h was controlled based on a measurement result on the 21st day from the start of the culture. An amount of bleeding was adjusted by controlling an output of the culture solution extraction pump 19f by the control device 24 such that the number of living cells in the culture tank 7 was maintained at 1×10^7 cells/mL.

[0149]

(Experimental Result)

FIG. 14 is a diagram showing measurement results of the number of living cells in Example 2 in which the perfusion culture is performed.

In FIG. 14, a horizontal axis represents the culture time [day], and a vertical axis represents the measured number of living cells [$\times 10^{8}$~~^{6}~~ cells/mL] or a survival rate of cells [%]. A plot of ○ indicates the number of living cells. A plot of Δ indicates the survival rate of cells. A section between broken lines indicates a period in which the cell concentration is controlled.