

pressure is insufficient.

[0009] The present invention has been implemented in view of the above-described problems, and it is one of objects of the present invention to provide a liquid supplying device capable of determining whether the CLC can be appropriately used or not.

[0010] According to the present disclosure, a liquid supplying device for supplying a liquid from a liquid source to a cleaning device is provided. This liquid supplying device includes a flow rate control device comprising a differential pressure type flowmeter and that measures a flow rate of the liquid from the liquid source and controls the flow rate based on the measured value, an IN-side pressure gauge provided between the liquid source and the flow rate control device and an OUT-side pressure gauge provided between the flow rate control device and the cleaning device, wherein the liquid supplying device comprises a plurality of the liquid sources, a plurality of the IN-side pressure gauges, a plurality of the flow rate control devices, and a confluence part at which the liquid from the flow rate control device join together, and the flow rate control device is selected from among various flow rate control devices having different controllable flow rate ranges, based on a differential pressure obtained from the IN-side pressure gauge and the OUT-side pressure gauge, the plurality of flow rate control devices are selected from among various flow rate control devices.

[0011] According to the present disclosure, a liquid supplying method is provided for a liquid supplying device provided with a flow rate control device that measures a flow rate from a liquid source and controls the flow rate based on the measured value, to supply a liquid from the liquid source to a cleaning device. The liquid supplying method includes a flow rate controlling step of measuring a flow rate from the liquid source and controlling the flow rate based on the measured value, a first measuring step of measuring a pressure of a liquid flowing into the flow rate control device and a second measuring step of measuring a pressure of a liquid flowing out from the flow rate control device, wherein the flow rate control device is selected from among various flow rate control devices having different controllable flow rate ranges, based on a differential pressure between the pressure measured

in the first measuring step and the pressure measured in the second measuring step.

[0011a] According to the present disclosure, a liquid supplying device for supplying a liquid from a liquid source to a cleaning device is provided, comprising: a flow rate control device comprising a differential pressure type flowmeter and configured to measure a flow rate of a liquid from the liquid source and control the flow rate based on the measured value; an IN-side pressure gauge provided between the liquid source and the flow rate control device; and an OUT-side pressure gauge provided between the flow rate control device and the cleaning device, wherein the liquid source comprises: a dilution water supply source; and a chemical supply source, the flow rate control device comprises: a dilution water flow rate control device configured to measure a flow rate of dilution water from the dilution water supply source and control the flow rate based on the measured value; and a chemical flow rate control device configured to measure a flow rate of a chemical from the chemical supply source and control the flow rate based on the measured value, the liquid supplying device further comprises a confluence part at which the dilution water from the dilution water flow rate control device and the chemical from the chemical flow rate control device join together and a mixer configured to mix the dilution water and the chemical supplied from the confluence part, the IN-side pressure gauge comprises a chemical IN-side pressure gauge provided between the chemical supply source and the chemical flow rate control device, and the OUT-side pressure gauge is provided between the mixer and the cleaning device.

[0011b] According to the present disclosure, a liquid supplying method is provided for a liquid supplying device provided with a flow rate control device comprising a differential pressure type flowmeter configured to measure a flow rate from a liquid source and controlling the flow rate based on the measured value, to supply a liquid from the liquid source to a cleaning device, the method comprising: a flow rate controlling step of measuring a flow rate from the liquid source and controlling the flow rate based on the measured value; a first measuring step of measuring a pressure of a liquid flowing into the flow rate control device; and a second measuring step of measuring a pressure of a liquid flowing out from the

flow rate control device , wherein the flow rate control device comprises: a dilution water flow rate control device configured to measure a flow rate of dilution water from a dilution water supply source and control the flow rate based on the measured value; and a chemical flow rate control device configured to measure a flow rate of a chemical from a chemical supply source and control the flow rate based on the measured value, the flow rate controlling step comprises: a dilution water flow rate controlling step of measuring the flow rate of the dilution water from the dilution water supply source and controlling the flow rate based on the measured value; and a chemical flow rate controlling step of measuring the flow rate of the chemical from the chemical supply source and controlling the flow rate based on the measured value; the liquid supplying method further comprises a step of mixing the dilution water, a flow rate of which is controlled and the chemical, a flow rate of which is controlled, the first measuring step comprises a step of measuring a pressure of the chemical flowing into the chemical flow rate control device, the second measuring step comprises a step of measuring a pressure of a mixed solution of the chemical and the dilution water.

BRIEF DESCRIPTION OF DRAWINGS

[0012] Fig. 1 is a schematic front view illustrating a chemical supplying device according to a first embodiment;

Fig. 2 is a diagram illustrating a chemical supply flow of the chemical supplying

WHAT IS CLAIMED IS:

1. A liquid supplying device for supplying a liquid from a liquid source to a cleaning device, comprising:

a flow rate control device comprising a differential pressure type flowmeter and configured to measure a flow rate of a liquid from the liquid source and control the flow rate based on the measured value;

an IN-side pressure gauge provided between the liquid source and the flow rate control device; and

an OUT-side pressure gauge provided between the flow rate control device and the cleaning device, wherein

the liquid supplying device comprises a plurality of the liquid sources, a plurality of the IN-side pressure gauges, a plurality of the flow rate control devices, and a confluence part at which the liquid from the flow rate control device join together, and

the flow rate control device is selected from among the plurality of flow rate control devices having different controllable flow rate ranges, based on a differential pressure obtained from the IN-side pressure gauge and the OUT-side pressure gauge, the plurality of flow rate

control devices are selected from among various flow rate control devices.

2. The liquid supplying device according to claim 1, wherein
the liquid source comprises:

a dilution water supply source; and

a chemical supply source,

the flow rate control device comprises:

a dilution water flow rate control device configured to measure a flow rate of dilution water from the dilution water supply source and control the flow rate based on the measured value; and

a chemical flow rate control device configured to measure a flow rate of a chemical from the chemical supply source and control the flow rate based on the

measured value,

the dilution water from the dilution water flow rate control device and the chemical from the chemical flow rate control device join together at the confluence part,

the liquid supplying device further comprises a mixer configured to mix the dilution water and the chemical supplied from the confluence part,

the IN-side pressure gauge comprises a chemical IN-side pressure gauge provided between the chemical supply source and the chemical flow rate control device, and

the OUT-side pressure gauge is provided between the mixer and the cleaning device.

3. The liquid supplying device according to claim 2, wherein

the IN-side pressure gauge further comprises a dilution water IN-side pressure gauge provided between the dilution water supply source and the dilution water flow rate control device.

4. A liquid supplying method for a liquid supplying device provided with a flow rate control device comprising a differential pressure type flowmeter configured to measure a flow rate from a liquid source and controlling the flow rate based on the measured value, to supply a liquid from the liquid source to a cleaning device, the method comprising:

a flow rate controlling step of measuring a flow rate from the liquid source and controlling the flow rate based on the measured value;

a first measuring step of measuring a pressure of a liquid flowing into the flow rate control device; and

a second measuring step of measuring a pressure of a liquid flowing out from the flow rate control device, wherein

the flow rate control device is selected from among various flow rate control devices having different controllable flow rate ranges, based on a differential pressure between the pressure measured in the first measuring step and the pressure measured in the second measuring step.

5. The liquid supplying method according to claim 4, wherein

the flow rate control device comprises:

a dilution water flow rate control device configured to measure a flow rate of dilution water from a dilution water supply source and control the flow rate based on the measured value; and

a chemical flow rate control device configured to measure a flow rate of a chemical from a chemical supply source and control the flow rate based on the measured value,

the flow rate controlling step comprises:

a dilution water flow rate controlling step of measuring the flow rate of the dilution water from the dilution water supply source and controlling the flow rate based on the measured value; and

a chemical flow rate controlling step of measuring the flow rate of the chemical from the chemical supply source and controlling the flow rate based on the measured value;

the liquid supplying method further comprises a step of mixing the dilution water, a flow rate of which is controlled and the chemical, a flow rate of which is controlled,

the first measuring step comprises a step of measuring a pressure of the chemical flowing into the chemical flow rate control device,

the second measuring step comprises a step of measuring a pressure a mixed solution of the chemical and the dilution water.

6. The liquid supplying method according to claim 5, wherein the first measuring step comprises a step of measuring the pressure of the dilution water flowing into the dilution water flow rate control device.

7. A liquid supplying device for supplying a liquid from a liquid source to a cleaning device, comprising:

a flow rate control device comprising a differential pressure type flowmeter and configured to measure a flow rate of a liquid from the liquid source and control the flow rate based on the measured value;

an IN-side pressure gauge provided between the liquid source and the flow rate control device; and

an OUT-side pressure gauge provided between the flow rate control device and the cleaning device , wherein

the liquid source comprises:

a dilution water supply source; and

a chemical supply source,

the flow rate control device comprises:

a dilution water flow rate control device configured to measure a flow rate of dilution water from the dilution water supply source and control the flow rate based on the measured value; and

a chemical flow rate control device configured to measure a flow rate of a chemical from the chemical supply source and control the flow rate based on the measured value,

the liquid supplying device further comprises a confluence part at which the dilution water from the dilution water flow rate control device and the chemical from the chemical flow rate control device join together and a mixer configured to mix the dilution water and the chemical supplied from the confluence part,

the IN-side pressure gauge comprises a chemical IN-side pressure gauge provided between the chemical supply source and the chemical flow rate control device, and

the OUT-side pressure gauge is provided between the mixer and the cleaning device.

8. A liquid supplying method for a liquid supplying device provided with a flow rate control device comprising a differential pressure type flowmeter configured to measure a flow rate from a liquid source and controlling the flow rate based on the measured value, to supply a liquid from the liquid source to a cleaning device, the method comprising:

a flow rate controlling step of measuring a flow rate from the liquid source and

controlling the flow rate based on the measured value;

a first measuring step of measuring a pressure of a liquid flowing into the flow rate control device; and

a second measuring step of measuring a pressure of a liquid flowing out from the flow rate control device , wherein

the flow rate control device comprises:

a dilution water flow rate control device configured to measure a flow rate of dilution water from a dilution water supply source and control the flow rate based on the measured value; and

a chemical flow rate control device configured to measure a flow rate of a chemical from a chemical supply source and control the flow rate based on the measured value,

the flow rate controlling step comprises:

a dilution water flow rate controlling step of measuring the flow rate of the dilution water from the dilution water supply source and controlling the flow rate based on the measured value; and

a chemical flow rate controlling step of measuring the flow rate of the chemical from the chemical supply source and controlling the flow rate based on the measured value;

the liquid supplying method further comprises a step of mixing the dilution water, a flow rate of which is controlled and the chemical, a flow rate of which is controlled,

the first measuring step comprises a step of measuring a pressure of the chemical flowing into the chemical flow rate control device,

the second measuring step comprises a step of measuring a pressure of a mixed solution of the chemical and the dilution water.