of the second pipe, through which the cleaning water flows. The repetitive flow of the cleaning water through the tip opening may cause the risk of exfoliation of the coating from the rim of the tip opening. The exfoliation further leads to corrosion in the wall surface of the piping. The periphery of the opening for supplying the cleaning water whether it is PFA coated or not is likely to be corroded earlier than the other part of the piping.

[0009] ~~It is an object~~Embodiments of the present invention seek to provide a detoxifying device capable of restraining performance deterioration of the device and failure of the entire device resulting from the corrosion in the wall surface of piping, a method of replacing the piping section of the detoxifying device, and a method of cleaning piping of the detoxifying device.

SOLUTION TO PROBLEM

[0010] The detoxifying device according to an aspect of the present invention has an inner wall that forms a flow passage through which the treatment gas flows. The detoxifying device includes a first piping, a replaceable piping section, ~~and~~ a second piping, a second stage piping portion, and a pressure sensor. The first piping forms a part of the flow passage. The piping section forms a part of the flow passage at a position downstream of the first piping, and is connected thereto. The piping section includes a first stage sprinkling portion for sprinkling a cleaning water to remove a solid product adhering to the inner wall. The second piping forms a part of the flow passage at a position downstream of the piping section, and is connected thereto. The second stage sprinkling portion is positioned upstream of the first stage sprinkling portion for sprinkling the cleaning water to remove the solid product adhering to the inner wall upstream of the first stage sprinkling portion. The pressure sensor can measure a pressure in the flow passage upstream of the first stage sprinkling portion. The first stage sprinkling portion sprinkles the cleaning water when the pressure sensor detects a pressure higher than a predetermined threshold value. The second stage sprinkling portion sprinkles the cleaning water when the treatment gas that causes generation of the solid product stops flowing through the flow passage.

[0011] The method of replacing a piping section of the detoxifying device is implemented according to another aspect of the present invention. The detoxifying device includes an inner wall that forms a flow passage through which treatment gas flows, a first piping that forms a part of the flow passage, a replaceable piping section that forms a part of the flow passage, is positioned downstream of the first piping and connected thereto, and includes a first stage sprinkling portion for sprinkling a cleaning water to remove a solid product adhering to the inner wall, ~~and~~ a second piping that forms a part of the flow passage, and is positioned downstream of the piping section and connected thereto. A second stage sprinkling portion is positioned upstream of the first stage sprinkling portion for sprinkling the cleaning water to remove the solid product adhering to the inner wall upstream of the first stage sprinkling portion. A pressure sensor can measure a pressure in the flow passage upstream of

the first stage sprinkling portion. The first stage sprinkling portion sprinkles the cleaning water when the pressure sensor detects a pressure higher than a predetermined threshold value. The second stage sprinkling portion sprinkles the cleaning water when the treatment gas that causes generation of the solid product stops flowing through the flow passage. The method includes a step of replacing the piping section.

[0012] The method of cleaning piping of the detoxifying device having an inner wall that forms a flow passage through which treatment gas flows is implemented according to another aspect of the present invention. The detoxifying device includes a first stage sprinkling portion for sprinkling a cleaning water to remove a solid product adhering to the inner wall, a second stage sprinkling portion positioned upstream of the first stage sprinkling portion for sprinkling the cleaning water to remove the solid product adhering to the inner wall upstream of the first stage sprinkling portion, and a pressure sensor for measuring a pressure in the flow passage upstream of the first stage sprinkling portion. The method includes a step of sprinkling the cleaning water from the first stage sprinkling portion when the pressure sensor detects a pressure higher than a predetermined threshold value, and a step of sprinkling the cleaning water from the second stage sprinkling portion when the treatment gas that causes

WHAT IS CLAIMED IS:

1. A detoxifying device having an inner wall that forms a flow passage through which treatment gas flows, the detoxifying device comprising:

a first piping that forms a part of the flow passage;

a replaceable piping section that forms a part of the flow passage at a position downstream of the first piping, and is connected to the first piping, the piping section having a first stage sprinkling portion for sprinkling a cleaning water to remove a solid product adhering to the inner wall; ~~and~~

a second piping that forms a part of the flow passage at a position downstream of the piping section, and is connected to the piping section;

a second stage sprinkling portion positioned upstream of the first stage sprinkling portion for sprinkling the cleaning water to remove the solid product adhering to the inner wall upstream of the first stage sprinkling portion; and

a pressure sensor for measuring a pressure in the flow passage upstream of the first stage sprinkling portion; wherein:

the first stage sprinkling portion sprinkles the cleaning water when the pressure sensor detects a pressure higher than a predetermined threshold value; and

the second stage sprinkling portion sprinkles the cleaning water when the treatment gas that causes generation of the solid product stops flowing through the flow passage.

2. The detoxifying device according to claim 1, further comprising a heater for heating the inner wall.

3. The detoxifying device according to claim 1 or 2, wherein the piping section is made of a corrosion-resistant metal.

4. The detoxifying device according to any one of claims 1 to 3, wherein a PFA coating is applied to the inner wall corresponding to the second piping.

5. The detoxifying device according to any one of claims 1 to 4, further comprising:

an O-ring that tightly seals a joint between the piping section and the first or the second piping; and

a clamp that brings the piping section in tight contact with the first or the second piping at the joint.

~~6. The detoxifying device according to any one of claims 1 to 5, further comprising a second stage sprinkling portion positioned upstream of the first stage sprinkling portion for~~

~~sprinkling the cleaning water to remove the solid product adhering to the inner wall upstream of the first stage sprinkling portion.~~

~~7. The detoxifying device according to claim 6, further comprising a pressure sensor for measuring a pressure in the flow passage upstream of the first stage sprinkling portion, wherein:~~

~~the first stage sprinkling portion sprinkles the cleaning water when the pressure sensor detects a pressure higher than a predetermined threshold value; and~~

~~the second stage sprinkling portion sprinkles the cleaning water when the treatment gas that causes generation of the solid product stops flowing through the flow passage.~~

~~8~~6. The detoxifying device according to ~~claim 7~~any one of claims 1 to 5, wherein the second stage sprinkling portion sprinkles the cleaning water in accordance with a timing when receiving a process gas stop signal from a device disposed in a prior stage or a subsequent stage of the detoxifying device, while the timing being regarded as a timing when the treatment gas that causes generation of the solid product stops flowing.

~~9~~7. The detoxifying device according to any one of claims 1 to 6~~ to 8~~, wherein the second stage sprinkling portion is included in the piping section.

~~10~~8. The detoxifying device according to any one of claims 1 to ~~9~~7, wherein the first stage sprinkling portion keeps blowing drying gas when sprinkling of the cleaning water is suspended.

~~11~~9. The detoxifying device according to claim ~~10~~8, wherein the drying gas is blown at a first flow rate constantly for a fixed period ~~from the end of~~after sprinkling of the cleaning water is suspended, and after an elapse of the fixed period, the drying gas is blown at a second flow rate that is lower than the first flow rate.

~~12~~10. The detoxifying device according to claim ~~10 or 11~~8 or 9, wherein inert gas is used as the drying gas.

~~13~~11. The detoxifying device according to any one of claims 1 to ~~12~~10, further comprising:

a fan scrubber having a liquid supply passage for supplying ~~the~~ a cleaning liquid; and

a spray positioned downstream of the first stage sprinkling portion for sprinkling the cleaning water to remove the solid product adhering to the liquid supply passage.

~~14~~12. The detoxifying device according to claim ~~13~~11, wherein the fan scrubber includes a fan and a canned motor for rotating the fan.

~~15~~13. A method of replacing a piping section of a detoxifying device having an inner wall forming a flow passage through which treatment gas flows, a first piping that forms a part of the flow passage, a replaceable piping section that forms a part of the flow passage at a position downstream of the first piping, and is connected to the first piping, the piping section having a first stage sprinkling portion for sprinkling a cleaning water to remove a solid product adhering to the inner wall~~, and~~; a second piping that forms a part of the flow passage at a position downstream of the piping section, and is connected to the piping section~~,~~; a second stage sprinkling portion positioned upstream of the first stage sprinkling portion for sprinkling the cleaning water to remove the solid product adhering to the inner wall upstream of the first stage sprinkling portion; and a pressure sensor for measuring a pressure in the flow passage upstream of the first stage sprinkling portion; wherein: the first stage sprinkling portion sprinkles the cleaning water when the pressure sensor detects a pressure higher than a predetermined threshold value; and the second stage sprinkling portion sprinkles the cleaning water when the treatment gas that causes generation of the solid product stops flowing through the flow passage; the method comprising a step of replacing the piping section.

~~16~~14. A method of cleaning piping of a detoxifying device having an inner wall forming a flow passage through which treatment gas flows, the detoxifying device including a first stage sprinkling portion for sprinkling a cleaning water to remove a solid product adhering to the inner wall, a second stage sprinkling portion positioned upstream of the first stage sprinkling portion for sprinkling the cleaning water to remove the solid product adhering to the inner wall upstream of the first stage sprinkling portion, and a pressure sensor for measuring a pressure in the flow passage upstream of the first stage sprinkling portion, the method comprising:

a step of sprinkling the cleaning water from the first stage sprinkling portion when the pressure sensor detects a pressure higher than a predetermined threshold value; and

a step of sprinkling the cleaning water from the second stage sprinkling portion when the treatment gas that causes generation of the solid product stops flowing through the flow passage.