CLAIMS

[Claim 1] A marine desulfurization device for desulfurizing exhaust gas discharged from an exhaust gas generating device mounted on a ship, comprising:

an absorption tower having an interior space for desulfurizing the exhaust gas and having an exhaust gas inlet for introducing the exhaust gas into the interior space;

a spraying device capable of spraying a cleaning liquid to the exhaust gas flowing in the interior space, the spraying device including a plurality of first spray pipes arranged in the interior space, a first header pipe connected to each of the plurality of first spray pipes, and a plurality of second spray pipes arranged in the interior space below the plurality of first spray pipes and the first header pipe;

a cleaning liquid supply device including a cleaning liquid supply pump configured to pressurize the cleaning liquid, and a cleaning liquid supply pipe configured to supply the cleaning liquid pressurized by the cleaning liquid supply pump to the first header pipe;

a first branch pipe connecting the cleaning liquid supply pipe to each of the plurality of second spray pipes; and

an emergency backflow prevention valve configured to prevent backflow from the cleaning liquid supply pipe to the cleaning liquid supply pump when the cleaning liquid supply pump is stopped, the emergency backflow prevention valve being disposed between the cleaning liquid supply pump and a connection portion where the cleaning liquid supply pipe is connected to the first branch pipe.

[Claim 2] The marine desulfurization device according to claim 1, further comprising a flow regulating valve disposed in the first branch pipe and configured to open at a predetermined opening degree when the cleaning liquid supply pump is operating.

[Claim 3] The marine desulfurization device according to claim 2,

wherein the flow regulating valve is configured to open at a larger opening degree when

the cleaning liquid supply pump is stopped than when the cleaning liquid supply pump is operating.

[Claim 4] The marine desulfurization device according to claim 2, further comprising:

a second branch pipe connecting the cleaning liquid supply pipe to each of the plurality of second spray pipes; and

an emergency on-off valve disposed in the second branch pipe and configured to close when the cleaning liquid supply pump is operating and to open when the cleaning liquid supply pump is stopped.

[Claim 5] The marine desulfurization device according to any one of claims 1 to 4,

wherein the spraying device further includes a plurality of first spray nozzles disposed in each of the plurality of first spray pipes and configured to inject the cleaning liquid upward.

[Claim 6] The marine desulfurization device according to any one of claims 1 to 5,

wherein the absorption tower includes:

an absorber body part having a first interior space through which the exhaust gas flows upward from below, the first interior space being part of the interior space; and

an exhaust gas introduction part having a second interior space through which the exhaust gas flows downward from above for introducing the exhaust gas from the exhaust gas inlet to the first interior space, the second interior space being part of the interior space, and

wherein the plurality of first spray pipes is arranged in the first interior space, and the plurality of second spray pipes is arranged in the second interior space.

[Claim 7] The marine desulfurization device according to claim 6,

wherein the spraying device further includes a plurality of second spray nozzles disposed in each of the plurality of second spray pipes, and

wherein the plurality of second spray nozzles includes a plurality of second upward spray

nozzles configured to inject the cleaning liquid upward.

[Claim 8] The marine desulfurization device according to any one of claims 1 to 5,

wherein the absorption tower includes an absorber body part having a first interior space through which the exhaust gas flows upward from below, the first interior space being part of the interior space, and

wherein the plurality of first spray pipes and the plurality of second spray pipes are arranged in the first interior space.

[Claim 9] The marine desulfurization device according to claim 8,

wherein the absorber body part includes a packing layer disposed below the first spray pipes and above the second spray pipes in the first interior space,

wherein the spraying device further includes a plurality of second spray nozzles disposed in each of the plurality of second spray pipes, and

wherein the plurality of second spray nozzles includes:

a plurality of second upward spray nozzles configured to inject the cleaning liquid upward; and

a plurality of second downward spray nozzles disposed in proximity to the exhaust gas inlet and configured to inject the cleaning liquid downward.

[Claim 10] The marine desulfurization device according to any one of claims 1 to 9,

wherein the marine desulfurization device is configured such that the cleaning liquid stored in the first header pipe flows down to each of the plurality of second spray pipes when the cleaning liquid supply pump is stopped.