【CLAIMS】

【Claim 1】

A system for circulating air through a double-walled gas supply pipe, the system comprising:

a double-walled pipe connected to a gas handling device to deliver a gas to the gas handling device;

a gas supply unit supplying the gas to the gas handling device through an inner pipe of the double-walled pipe;

an air supply unit supplying air to an outer pipe of the double-walled pipe;

an air discharge line for discharging the air circulated from the outer pipe; and

an air suction unit connected to the air discharge line and adapted to suction and circulate the air supplied to the outer pipe from the air supply unit using a high-pressure fluid introduced thereinto,

wherein the air suction unit is an air ejector adapted to suction the air from the outer pipe using high-pressure air introduced thereinto,

the system further comprising:

a second discharge line for discharging the air introduced into the air ejector,

wherein the second discharge line is connected to an air supply line for delivering the air from the air supply unit to the outer pipe to allow the air discharged through the second discharge line to be circulated to the outer pipe through the air supply line such that air circulation to the outer pipe is achieved without additional air supply from the air supply unit.

【Claim 2】

The system according to claim 1, wherein, upon detection of gas leakage into the outer pipe, air circulation from the second discharge line to the air supply line is shut off and the air supply unit is controlled to resume air supply to the outer pipe.

【Claim 3】

A system for circulating air through a double-walled gas supply pipe, the system comprising:

a double-walled pipe connected to a gas handling device to deliver a gas to the gas handling device;

a gas supply unit supplying the gas to the gas handling device through an inner pipe

of the double-walled pipe;

an air supply unit supplying air to an outer pipe of the double-walled pipe;

an air discharge line for discharging the air circulated from the outer pipe; and

an air suction unit connected to the air discharge line and adapted to suction and circulate the air supplied to the outer pipe from the air supply unit using a high-pressure fluid introduced thereinto,

wherein: the air suction unit is a steam ejector adapted to suction the air from the outer pipe using high-pressure steam introduced thereinto,

the system further comprising:

a steam supply device producing steam and supplying the steam to the steam ejector;

a condensate water circulation line branched off downstream of the steam ejector to be connected to the steam supply device; and

a third discharge line branched off downstream of the steam ejector to discharge the steam and the gas from a ship comprising the system.

【Claim 4】

The system according to claim 3, wherein, under normal circumstances, the steam introduced into the steam ejector is supplied back to the steam supply device through the condensate water circulation line and, upon occurrence of gas leakage into the outer pipe, the steam introduced into the steam ejector is discharged together with the leaked gas through the third discharge line.

【Claim 5】

The system according to claim 3, wherein the condensate water circulation line and the third discharge line are branched off of each other via a three-way valve disposed downstream of the steam ejector.

【Claim 6】

The system according to claim 4, wherein the steam introduced into the steam ejector is converted into condensate water and sent to a cascade tank through the condensate water circulation line to be temporarily stored in the cascade tank, and the cascade tank is formed with a venting line through which the leaked gas is discharged.

【Claim 7】

The system according to claim 4, further comprising:

a gas detector disposed on the air discharge line to detect leakage of the gas.

【Claim 8】

The system according to claim 1 or 3, further comprising:

a gas purging line connected to the double-walled pipe to discharge the gas leaking into the outer pipe; and

a controller controlling gas supply from the gas supply unit and air supply from the air supply unit, detecting the gas leaking from the double-walled pipe, and discharging the leaked gas through the gas purging line.

【Claim 9】

A method of circulating air through a double-walled gas supply pipe, comprising:

supplying, by an air supply unit, air to an outer pipe of the double-walled gas supply pipe;

suctioning, by an air ejector, the air in the outer pipe toward an air discharge line through introduction of high-pressure air into the air ejector;

discharging the air introduced into the air ejector through a second discharge line; and

circulating the air discharged through the second discharge line to the outer pipe,

wherein air circulation to the outer pipe is achieved without additional air supply from the air supply unit by circulating the air introduced into the air ejector and having been discharged through the second discharge line to the outer pipe.

【Claim 10】

The method according to claim 9, further comprising:, upon detection of gas leakage into the outer pipe, shutting off air circulation from the second discharge line to the outer pipe while controlling the air supply unit to resume air supply to the outer pipe.

【Claim 11】

A method of circulating air through a double-walled gas supply pipe, comprising:

supplying, by an air supply unit, air to an outer pipe of the double-walled gas supply pipe;

suctioning, by a steam ejector, the air in the outer pipe toward an air discharge line

through introduction of high-pressure steam into the steam ejector; and

discharging the steam introduced into the steam ejector,

wherein, under normal circumstances, the steam introduced into the steam ejector is discharged to a condensate water circulation line and, upon occurrence of gas leakage into the outer pipe, the steam introduced into the steam ejector is discharged together with the leaked gas to an outside of a ship employing the method through a third discharge line.

【Claim 12】

The method according to claim 11, wherein the steam introduced into the steam ejector is produced by a steam supply device provided to the ship or the offshore structure.

【Claim 13】

The method according to claim 12, further comprising:

converting the steam discharged to the condensate circulation line from the steam ejector into condensate water; and

supplying the condensate water back to the steam supply device.

【Claim 14】

The method according to claim 13, further comprising:

temporarily storing the condensate water in a cascade tank,

wherein the cascade tank is formed with a venting line through which the leaked gas is discharged.

【Claim 15】

The method according to claim 10 or 11, further comprising: upon detection of gas leakage into the outer pipe, shutting off gas supply to an inner pipe of the double-walled gas supply pipe while discharging the leaked gas through a gas purging line connected to the double-walled gas supply pipe.