

treatment system for a vessel, which has a cargo tank storing liquefied natural gas, and an engine using the liquefied natural gas stored in the cargo tank as fuel, the liquefied gas treatment system including: a first stream of boil-off gas, which is generated from the liquefied natural gas in the cargo tank and is discharged from the cargo tank; a second stream of the boil-off gas, which is supplied as fuel to the engine in the first stream; and a third stream of the boil-off gas, which is not supplied to the engine in the first stream, wherein the first stream is compressed at 150 to 400 bara in a compressor and is then branched into the second stream and the third stream, and the third stream is liquefied by exchanging heat with the first stream of the boil-off gas in a heat exchanger, so that the boil-off gas is treated without employing a reliquefaction apparatus using a separate refrigerant.

The third stream liquefied in the heat exchanger may be decompressed by decompressing means.

The third stream decompressed to a gas-liquid mixed state may be returned to the cargo tank.

A gas component in the third stream decompressed to a gas-liquid mixed state may be joined with the first stream of the boil-off gas discharged from the cargo tank.

The third stream supplied to the decompressing means may be cooled by heat exchange in a cooler installed at an upstream side of the decompressing means, together with the gas component in the third stream decompressed to the gas-liquid mixed state while passing through the decompressing means.

A gas-liquid separator may be installed to separate only a liquid component from the third stream decompressed to a gas-liquid mixed state and return the liquid component to the cargo tank.

The compressor may include a plurality of compression cylinders.

The liquefied gas treatment system may further include boil-off gas consuming means that receives and uses boil-off gas compressed while passing through a part of the plurality of compression cylinders included in the compressor.

The boil-off gas supplied to the heat exchanger may be a boil-off gas compressed

WHAT IS CLAIMED IS:

1. A liquefied gas treatment system for a vessel, which includes a cargo tank storing liquefied natural gas, and an engine using the liquefied natural gas stored in the cargo tank as fuel, the liquefied gas treatment system comprising:

a first stream of boil-off gas, which is generated from the liquefied natural gas in the cargo tank and is discharged from the cargo tank;

a second stream of the boil-off gas, which is supplied as fuel to the engine in the first stream; and

a third stream of the boil-off gas, which is not supplied to the engine in the first stream,

wherein the first stream is compressed at 150 to 400 bara in a compressor and is then branched into the second stream and the third stream, and

the third stream is liquefied by exchanging heat with the first stream of the boil-off gas in a heat exchanger, so that the boil-off gas is treated without employing a reliquefaction apparatus using a separate refrigerant.

2. The liquefied gas treatment system according to claim 1, wherein the third stream liquefied in the heat exchanger is decompressed by decompressing means.

3. The liquefied gas treatment system according to claim 2, wherein the third stream decompressed to a gas-liquid mixed state is returned to the cargo tank.

4. The liquefied gas treatment system according to claim 2, wherein a gas component in the third stream decompressed to a gas-liquid mixed state is joined with the first stream of the boil-off gas discharged from the cargo tank.

5. The liquefied gas treatment system according to claim 4, wherein the third