motor is also disposed in a region where gas leakage can occur, the compressors require an explosion-proof electric motor, causing significant increase in costs.

[13] Due to such technical and cost problems, the LNG-fueled vessel uses such a BOG compressor, which still has many problems as mentioned above.

[14] The present invention has been conceived to solve such problems in the related art and embodiments of the present invention provide a boil-off gas compressor for LNG-fueled vessels using LNG as fuel for propulsion engines thereof, in which a compressor housing is integrally formed with a motor housing to fundamentally prevent leakage of a combustible gas, that is, boil-off gas, and inflow of external air.

[15] Embodiments of the present invention provide a boil-off gas compressor for LNG-fueled vessels, which adopts a centrifugal compressor capable of compressing boil-off gas in a cryogenic state without heating the boil-off gas using an inlet heater, thereby improving compression efficiency.

[16] Embodiments of the present invention provide a boil-off gas compressor for LNG-fueled vessels, which uses a self-lubricating bearing to prevent leakage of a lubricant oil influencing the quality of compressed boil-off gas and can obtain a target impeller RPM without using a set-up gear by increasing motor RPM through a high-frequency inverter.

【Summary】

[16a] In an aspect of the present disclosure, there is provided a boil-off gas compressor for LNG-fueled vessels using LNG as fuel for propulsion engines thereof, the boil-off gas compressor comprising:

a compressor housing having an impeller rotatably disposed therein;

a motor housing having a motor for driving the impeller therein; and

a bearing rotatably supporting a rotational shaft transmitting rotation driving force of the motor to the impeller,

wherein the compressor housing is integrally formed with the motor housing,

wherein the boil-off gas compressor is configured so that the boil-off gas

leaked from the compressor housing can flow into the motor housing,

wherein the boil-off gas is combustible, and

wherein the compressor housing and the motor housing are integrally formed and an interior of the motor housing is maintained at a higher pressure than atmospheric pressure, thereby preventing external gases including oxygen from entering the motor housing.

【Technical Solution】

[17] In accordance with one aspect of the present invention, a boil-off gas compressor for LNG-fueled vessels using LNG as fuel for a propulsion engine thereof includes: a compressor housing having an impeller rotatably disposed therein; a motor housing having a motor for driving the impeller therein; and a bearing rotatably supporting a rotational shaft transmitting rotation driving force of the motor to the impeller, wherein the compressor housing is integrally formed with the motor housing.

[18] The motor may be driven by a high speed frequency inverter and the impeller may be directly connected to the motor without a separate set-up gear.

【CLAIMS】

1. A boil-off gas compressor for LNG-fueled vessels using LNG as fuel for propulsion engines thereof, the boil-off gas compressor comprising:

a compressor housing having an impeller rotatably disposed therein;

a motor housing having a motor for driving the impeller therein; and

a bearing rotatably supporting a rotational shaft transmitting rotation driving force of the motor to the impeller,

wherein the compressor housing is integrally formed with the motor housing,

wherein the boil-off gas compressor is configured so that the boil-off gas leaked from the compressor housing can flow into the motor housing,

wherein the boil-off gas is combustible, and

wherein the compressor housing and the motor housing are integrally formed and an interior of the motor housing is maintained at a higher pressure than atmospheric pressure, thereby preventing external gases including oxygen from entering the motor housing.

2. The boil-off gas compressor according to claim 1, wherein the motor is driven by a high speed frequency inverter and the impeller is directly connected to the motor without a separate set-up gear.

3. The boil-off gas compressor according to claim 1, wherein the bearing is a self-lubricating type bearing not using lubricant oil.

4. The boil-off gas compressor according to claim 1, wherein a set of the impeller and the compressor housing is disposed at each of both sides of the motor housing.

5. The boil-off gas compressor according to claim 4, wherein the impeller comprises a first impeller disposed at one side of the motor housing and a second impeller disposed at the other side of the motor housing, and boil-off gas compressed while passing through the first impeller is cooled by an intermediate cooler and then supplied to the second impeller to be additionally compressed thereby.

6. The boil-off gas compressor according to claim 1, wherein:

the rotational shaft extends into the compressor housing through a partition wall between the motor housing and the compressor housing; and

the compressor housing communicates with the motor housing through a gap between the rotational shaft and the partition wall to allow the boil-off gas to flow from the compressor housing to the motor housing.

7. The boil-off gas compressor according to claim 6, wherein the partition wall between the motor housing and the compressor housing is provided with an insulating member.

8. The boil-off gas compressor according to claim 7, wherein a portion of each of the partition wall and the insulating member through which the rotational shaft passes is provided with an air-tightening/heating member having both an air-tightening function and a heating function to relieve decrease in temperature of the motor by the insulating member and the air-tightening/heating member.

9. The boil-off gas compressor according to claim 1, further comprising:

a pressure sensor detecting an interior pressure of the motor housing.

10. The boil-off gas compressor according to claim 1, wherein the motor housing is formed with a supply hole through which a gas is supplied from an exterior to the motor housing and with a vent hole through which an interior gas is discharged.

11. The boil-off gas compressor according to claim 1, wherein the interior of the motor housing is filled with a combustible gas.