compresses air. Therefore, there is a need for a solution that can save energy for generation of compressed air used in the air lubrication system.

[0007] It should be noted that the above description is provided for understanding of the background of the invention and is not a description of a well-known conventional technique in the art to which the present invention pertains.

SUMMARY

[0008] It is an object of the present disclosure to provide an air lubrication system for ships, which ejects compressed air to a surface of a ship bottom in order to reduce frictional resistance generated upon navigation of a ship and can reduce power consumption in operation of a compressor adapted to generate the compressed air.

[0009] In accordance with one aspect of the present disclosure, an air lubrication system for ships adapted to reduce frictional resistance applied to a hull of a ship during navigation of the ship includes: multiple air chambers disposed on a ship bottom; and a main supply line adapted to supply compressed air to the multiple air chambers, wherein at least part of scavenge air to be supplied to the main engine is supplied to the multiple air chambers, further comprising: an air compressor disposed on the main supply line upstream of a connection point of a scavenge air bypass line to the main supply line and generating compressed air; and a first valve disposed between the air compressor and the connection point of the scavenge air bypass line to the main supply line, wherein the ship is provided with a turbocharger compressing suctioned air using an emission gas discharged from the main engine and a scavenge air supply line connecting the turbocharger to the main engine to supply the compressed air as scavenge air of the main engine, and further comprises the scavenge air bypass line branched off of the scavenge air supply line and connected to the main supply line, wherein when the amount of the scavenge air supplied to the main supply line through the scavenge air bypass line is small or when pressure of air supplied to the multiple air chambers is low, the air compressor is

operated and the first valve is open to provide a sufficient amount of the compressed air to mix with the scavenge air to form a stream of air, and the stream of air is applied to the multiple air chambers through the main supply line.

[0010] The ship may be provided with a turbocharger compressing suctioned air using an emission gas discharged from the main engine and a scavenge air supply line connecting the turbocharger to the main engine to supply the compressed air as scavenge air of the main engine.

[0011] The ship may further include a scavenge air bypass line branched off of the scavenge air supply line and connected to the main supply line.

[0012] The ship may further include an air cooler disposed on the main supply line and cooling the air supplied to the multiple air chambers.

[0013] The scavenge air bypass line may be disposed upstream of the cooler on the main supply line.

[0014] The ship may further include: an air compressor disposed on the main supply line upstream of a connection point of the scavenge air bypass line to the main supply line and generating compressed air; and a first valve disposed between the

connection point of the scavenge air bypass line to the main supply line and the air compressor.

[0015] The scavenge air supply line may be provided with a cooler cooling the air compressed through the turbocharger and a scavenge air receiver disposed downstream of the cooler and storing the scavenge air.

[0016] The scavenge air bypass line may be branched between the cooler and the scavenge air receiver.

[0017] The ship may further include a scavenge valve disposed on the scavenge air bypass line and controlling supply of the scavenge air to the main supply line.

[0018] The scavenge valve may be controlled to be shut off in an IMO Nox III Mode or under low load conditions of the main engine.

[0019] The ship may further include: an overboard discharge line branched off of the main supply line and adapted to discharge the compressed air from the ship instead of supplying the compressed air to the multiple air chambers; and a blow-off valve disposed on the overboard discharge line.

[0020] According to examples of the present disclosure, the air lubrication system for ships ejects compressed air to the surface of the ship bottom in order to reduce frictional resistance during navigation of the ship and supplies at least part of scavenge air to the multiple air chambers instead of supplying all of the scavenge air to the main engine in order to reduce power consumption through reduction in operation time of the air compressor.

[0021] In addition, according to the examples of the present disclosure, the scavenge valve is disposed on the scavenge air bypass line branched off of the scavenge air supply line to open or close the scavenge air bypass line as needed, thereby protecting the main engine while minimizing inefficient operation thereof.

DRAWINGS

[0022] The above and other aspects, features, and advantages of the present invention will become apparent from the detailed description of the following embodiments in conjunction with the accompanying drawings: