are provided with advanced drilling equipments and have structures similar to typical ships such that they can make a voyage using their own power. Since drill ships have to frequently move in order for development of small marginal fields, they are constructed to make a voyage using their own power, without assistance of tugboats.

FIG. 1 is a side view illustrating a conventional arctic ship which performs a drilling operation on the sea.

A moonpool 3 is formed at the center of a conventional arctic ship 1, such that a riser 4 or a drill pipe 5 is vertically movable through the moonpool 3. In addition, a derrick 2 in which a variety of drilling equipments are integrated is installed on a deck.

The conventional derrick 2 has an opened structure in which steel pipes are coupled together, like a power transmission tower installed on the ground. A crown block section in which a crown block is installed is formed at an upper portion of the derrick. The crown block section is formed in a conical shape which becomes narrower upwardly. In the case of the derrick having such an opened structure, natural ventilation is possible without any separate mechanical ventilating apparatus.

However, if the conventional derrick having the opened structure is installed in an arctic ship which sails around an arctic region, a variety of drilling equipments are exposed at below zero temperatures for a long time. Consequently, the drilling equipments may not operate normally. Also, due to the structural shape of the conical crown block section that becomes narrower upwardly, the worker's accessiblity becomes weak.

SUMMARY OF THE INVENTION

EmbodimentsAn aspect of the present invention areis directed to an arctic ship with a derrick, which can enclose the derrick in order to achieve a smooth operation in an arctic region and can monitor the temperature and pressure of the derrick and the moonpool and appropriately maintain the temperature and pressure of the derrick and a moonpool, considering influence of temperature and waves.

EmbodimentsAnother aspect of the present invention areis directed to an arctic ship with a derrick, which can effectively compensate or offset a negative pressure or a positive pressure generated within an enclosed derrick and an enclosed moonpool due to influence of waves.

EmbodimentsAnother aspect of the present invention areis directed to an enclosed derrick structure for an arctic ship, in which an upper portion of an enclosed derrick is gradually widened upwardly and thus a crown block platform can be used for installation and maintenance of equipments.

According to an aspectembodiment of the present invention, an arctic ship with a derrick includes: the derrick forming an enclosed space blocked from outside air; a moonpool coupled to a lower portion of the derrick to communicate with the derrick and blocked from the outside air; and an air supply/exhaust device installed to communicate an inner space of the derrick or the moonpool with the exterior, wherein air condition of the inner space is maintained or controlled at a predetermined range by the air supply/exhaust device, and wherein the derrick is enclosed from an upper of the derrick to the moonpool.

The air supply/exhaust device includes: a supply unit supplying the outside air to the derrick or the moonpool; and an exhaust unit exhausting the supplied outside air through an upper portion of the derrick.

The supply unit may include a heater which heats the supplied outside air.

The supply unit and/or the exhaust unit may include an open/close valve which opens or closes a flow of supplied or exhausted air.

The supply unit and/or the exhaust unit may include a supply louver which prevents the inflow of particles other than air.

The air supply/exhaust device may further include an openable/closable air supply port through which the outside air is supplied to the derrick.

The arctic ship may further include a heat blower provided inside the derrick to heat air in order for effective ventilation.

A supply fan may be installed in the supply unit, an exhaust fan may be installed