

sizes and pressure ratings and several units serving various functions are typically combined to compose a blowout preventer stack. Blowout preventers may perform any of a variety of functions such as confining well fluid to the wellbore, providing means to add fluid to the wellbore, allowing controlled volumes of fluid to be withdrawn from the wellbore, regulating and monitoring wellbore pressure, centering and hanging off the drill string in the wellbore, shutting in the well, preventing the flow of formation fluid, and sealing the well.

[0007] Blowout preventers are critical to the safety of crew, rig and environment, and to the monitoring and maintenance of well integrity. Thus, blowout preventers are intended to be fail-safe devices. As recommend by authorities and required by various regulations, blowout preventers must be regularly tested, inspected, and refurbished. Blowout preventers typically include one set of corresponding ram blocks, and when the ram blocks need to be replaced or refurbished, companies are required by law to retest the entire blowout preventer stack. This may take long periods of time and may incur great expenses. A number of blowout preventers, including different types of ram blocks, are typically needed on the blowout preventer stack in order to serve a variety of different functions.

SUMMARY

[0008] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

[0009] ~~According to an example, a ram block carrier includes an opening, an upper shelf within the opening configured to hold an upper ram block, and a lower shelf within the opening configured to hold a lower ram block.~~

According to a first aspect of the present invention, there is provided a ram block carrier, comprising: an opening; an upper shelf within the opening configured to hold an upper ram block; and a lower shelf within the opening configured to hold a lower ram block.

[00010] ~~In another example, a housing of a blowout preventer includes a bore, a first cavity on a side of the bore, a second cavity on another side of the bore, and inside walls,~~

~~adjacent to the first and second cavities, each comprising an opening which allows a ram block to access the bore.~~

According to a second aspect of the present invention, there is provided a housing of a blowout preventer, comprising: a bore; a first cavity on a side of the bore; a second cavity on another side of the bore; and inside walls, adjacent to the first and second cavities, each comprising an opening which allows a ram block to access the bore, wherein the first cavity and the second cavity are each configured to receive a ram block carrier that is movable within the housing.

[00011] ~~In another example, a blowout preventer includes a housing, a ram block carrier configured to move within the housing, and one or more ram blocks configured to be placed within the ram block carrier.~~

According to a third aspect of the present invention, there is provided a blowout preventer, comprising: a housing; a ram block carrier configured to move within the housing; and one or more ram blocks configured to be placed within the ram block carrier.

[00012] ~~In another example, a method of operating a blowout preventer includes moving a ram block carrier within the blowout preventer, and moving a ram block of the ram block carrier towards a pipe going through a bore of the blowout preventer.~~

According to a fourth aspect of the present invention, there is provided a method of operating a blowout preventer, the method comprising: moving a ram block carrier within the blowout preventer; and moving a ram block of the ram block carrier towards a bore of the blowout preventer.

BRIEF DESCRIPTION OF THE DRAWINGS

[00013] The foregoing summary, as well as the following detailed description, will be better understood when read in conjunction with the appended drawings. For the purpose of illustration, certain examples of the present description are shown in the drawings. It should be understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown. The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate an implementation of system, apparatuses, and methods consistent with the present description and, together with the description, serve to explain advantages and principles consistent with the invention.

[00014] FIG. 1 is a diagram illustrating a perspective view of an example of a blowout preventer.

[00015] FIG. 2 is a diagram illustrating a perspective view of an example of a blowout preventer in an open-door configuration.

[00016] FIG. 3 is a diagram illustrating a perspective view of an example of a housing of a blowout preventer.

[00017] FIG. 4 is a diagram illustrating a perspective view of an example of a ram block carrier of a blowout preventer.

[00018] FIGS. 5A and 5B are diagrams illustrating front and top cross-sectional views of an example of a blowout preventer including a hydraulic actuator and mechanical override mechanism for movement of the ram blocks.

[00019] FIG. 5C is a diagram illustrating an example of a ram block including a T-slot for connection to an actuating rod.