blowout preventer is typically a flange connection which is bolted to an upper end of the component directly below. The upper end connection of the blowout preventer is typically a non-flange connection which is bolted to a lower end of the component directly above. The upper end connection of the blowout preventer comprises one or more ram cavities which intersect a longitudinal bore of the blowout preventer.

[0005] One or more fasteners on the upper end connection of the blowout preventer are located over the ram cavities. Other bolts are not located over the ram cavities. The bolts over the ram cavities can move up or down when under load because of the elastic deflection of the body above the ram cavities. The other bolts cannot move up or down as much. As a result, the bolts over the ram cavities experience lower stresses than the bolts not over the ram cavities, i.e., loading on the upper end connection bolts is uneven. Accordingly, a blowout preventer end connection providing for more even loading is desirable.

Summary

[0005a] According to a first aspect, there is provided a blowout preventer housing, comprising: a longitudinal bore extending through the housing; a cavity intersecting the bore; grooves in a longitudinal outer-side profile of the blowout preventer housing and on opposite sides of the cavity and axially overlapping with the cavity with respect to an axis of the bore; an end connection configured to couple the housing with another component, the end connection comprising a plurality of fasteners for fastening the end connection to the another component with the fasteners distributed about the circumference of the end connection; and wherein the fasteners are located above the cavity and above the grooves such that the grooves are configured to balance stress across the fasteners.

[0005b] According to a second aspect, there is provided a blowout preventer comprising a housing comprising: a longitudinal outer-side profile; a longitudinal bore extending through the housing; a cavity intersecting the bore; grooves in the longitudinal outer-side profile of the blowout preventer housing and on opposite sides of the cavity and axially overlapping with the cavity with respect to an axis of the bore; and an end connection comprising a plurality of fasteners for fastening the end connection to another component with the fasteners distributed about the circumference of the end connection; wherein the fasteners are located above the cavity and above the grooves such that the grooves are configured to balance stress across the fasteners.

Brief Description of the Drawings

[0006] For a detailed description of the preferred embodiments of the present disclosure, reference will now be made to the accompanying drawings in which:

[0007] FIG. 1 shows an isometric view of a blowout preventer according to one or more embodiments;

[0008] FIG. 2 shows an isometric view of a blowout preventer housing with two ram cavities;

[0009] FIG. 3 shows an isometric view of a blowout preventer housing with a single ram cavity according to one or more embodiments of the disclosure;

[0010] FIG. 4 shows a side elevation view of the blowout preventer of FIG. 3;

[0011] FIG. 5 shows another side elevation view of the blowout preventer of FIG. 3;

[0012] FIG. 6 shows a top view of the blowout preventer of FIG. 3;

[0013] FIG. 7 shows cross-sectional isometric view of the blowout preventer of FIG. 3;

[0014] FIG. 8 shows a cross-sectional isometric view of a blowout preventer with grooves; and

[0015] FIG. 9 shows a cross-sectional isometric view of a blowout preventer with without grooves.

Detailed Description

[0016] The following discussion is directed to various embodiments of the present disclosure. The figures are not necessarily to scale. Certain features of the embodiments may

CLAIMS

What is claimed is:

1. A blowout preventer housing, comprising: a longitudinal bore extending through the housing; a cavity intersecting the bore; grooves in a longitudinal outer-side profile of the blowout preventer housing and on opposite sides of the cavity and axially overlapping with the cavity with respect to an axis of the bore; an end connection configured to couple the housing with another component, the end connection comprising a plurality of fasteners for fastening the end connection to the another component with the fasteners distributed about the circumference of the end connection; and wherein the fasteners are located above the cavity and above the grooves such that the grooves are configured to balance stress across the fasteners.

2. The blowout preventer housing of claim 1, further comprising two or more cavities intersecting the bore.

3. The blowout preventer housing of claim 1, wherein the grooves are configured to mitigate uneven loading of the fasteners under load.

4. The blowout preventer housing of claim 1, wherein the grooves are configured to mitigate overall stress experienced by the fasteners under loading.

5. The blowout preventer housing of claim 1, wherein the grooves are locatable below the end connection.

6. The blowout preventer housing of claim 1, wherein the fasteners are bolts.

7. The blowout preventer housing of claim 1, further comprising a plurality of cavities.

8. The blowout preventer housing of claim 1, wherein the grooves comprise the same dimensions.

9. The blowout preventer housing of claim 1, wherein the blowout preventer housing is assembled in a stack comprising a plurality of blowout preventer housings.

10. The blowout preventer housing of claim 9, wherein each of the plurality of blowout preventer housings includes grooves.

11. The blowout preventer housing of claim 1, further comprising: a bonnet housing; a ram movably positioned within the cavity and at least partially movable into the bore of the blowout preventer housing; a rod configured to move the ram; and a piston movably positionable within the bonnet housing and configured to move the rod.

12. A blowout preventer comprising a housing comprising: a longitudinal outer-side profile; a longitudinal bore extending through the housing; a cavity intersecting the bore; grooves in the longitudinal outer-side profile of the blowout preventer housing and on opposite sides of the cavity and axially overlapping with the cavity with respect to an axis of the bore; and an end connection comprising a plurality of fasteners for fastening the end connection to another component with the fasteners distributed about the circumference of the end connection; wherein the fasteners are located above the cavity and above the grooves such that the grooves are configured to balance stress across the fasteners.

13. The blowout preventer of claim 12, wherein the grooves are configured to mitigate uneven loading of the fasteners under load.

14. The blowout preventer housing of claim 12, wherein the grooves are configured to mitigate overall stress experienced by the fasteners under loading.

15. The blowout preventer housing of claim 12, wherein the grooves extend across a face of the longitudinal outer-side profile of the housing.