such contamination in order to help ensure proper functionality of BOPs. Various types of pressure seals can be used to provide a physical separation between the fluids in a hydraulic fluid chamber of a BOP and the fluids or other materials in the central bore or bore chamber of a BOP. However, pressure seals can be subject to damage and degradation over time, which may result from exposure to wellbore fluid. As a result, various types of wiper seals (aka wipers or swarf wipers) can be used to help prevent or minimize exposure of pressure seals or other components to wellbore fluid.

[0004] The present disclosure is directed to improved wipers for at least partially minimizing exposure of pressure seals or other components to wellbore fluids and to BOPs including the same.

SUMMARY OF THE INVENTION

[0004a] According to a first aspect of the present invention, there is provided a wiper for an annular blowout preventer having an adapter ring and a piston slideable relative to the adapter ring along an interface, the wiper comprising: a base adapted to couple the wiper to the adapter ring; and a head coupled to the base; wherein the head includes a first portion adapted to bridge the interface and contact the piston and a second portion adapted to contact a surface of the adapter ring; wherein the second portion of the head is adapted to bias the first portion of the head toward the piston; and wherein the first portion of the head is adapted to wipe the piston when the piston slides relative to the adapter ring.

[0004b] According to a second aspect of the present invention, there is provided an annular blowout preventer, comprising: an adapter ring having an interior wall; a piston having an exterior wall and being slideable relative to the adapter ring along an interface between the interior wall of the adapter ring and the exterior wall of the piston; a pressure seal disposed along the interface fluidicly between a bore chamber and a hydraulic fluid chamber; and a wiper disposed within the bore chamber, the wiper comprising a base coupled to the adapter ring; and a head coupled to the base; wherein the head includes a first portion adapted to bridge the interface and contact the piston and a second portion adapted to contact the interior wall of the adapter ring; wherein the second portion of the head is adapted to bias the first portion of the head toward the piston; and wherein the first portion of the head is adapted to wipe the piston when the piston slides relative to the adapter ring.

[0004c] According to a third aspect of the present invention, there is provided an annular

blowout preventer, comprising: a stationary component; a piston slideable relative to the stationary component along an interface; a pressure seal disposed along the interface fluidicly between a bore chamber and a hydraulic fluid chamber; and a wiper disposed within the bore chamber, the wiper comprising a base coupled to the stationary component; and a head coupled to the base; wherein the head includes a first portion adapted to bridge the interface and contact the piston and a second portion adapted to contact a wall of the stationary component; wherein the second portion of the head is adapted to bias the first portion of the head toward the piston; and wherein the first portion of the head is adapted to wipe at least a portion of the piston when the piston moves relative to the stationary component.

BRIEF DESCRIPTION OF DRAWINGS

[0005] FIG. 1 is a partial cross-sectional view of one of many conventional BOPs.

[0006] FIG. 2 is a partial cross-sectional view of one of many embodiments of a BOP according to the disclosure.

[0007] FIG. 3 is a partial cross-sectional view of another of many embodiments of a BOP according to the disclosure.

[0008] FIG. 4 is a cross-sectional view of one of many embodiments of a wiper according to the disclosure.

[0009] FIG. 5 is a cross-sectional view of another of many embodiments of a wiper according to the disclosure.

[0010] FIG. 6 is an example stress analysis of the wiper of FIG.4.

[0011] FIG. 7 is an example stress analysis of the wiper of FIG. 5.

DETAILED DESCRIPTION OF DISCLOSED EMBODIMENTS

[0012] As an initial matter, it will be appreciated that the development of an actual, real commercial application incorporating aspects of the disclosed embodiments will require many implementation-specific decisions to achieve the developer's ultimate goal for the commercial embodiment. Such implementation-specific decisions may include, and likely are not limited to, compliance with system-related, business-related, government-related and other constraints, which may vary by specific implementation, location and from time to time. While a developer's efforts might be complex and time-consuming in an absolute sense, such efforts would nevertheless be a routine undertaking for those of skill in this art having the benefits of this disclosure. It should also be understood that the embodiments disclosed and taught herein are susceptible to