

**DOWNHOLE CIRCULATING VALVE HAVING A METAL-TO-METAL SEAL
AND METHOD FOR OPERATING SAME**

Abstract

A downhole circulating valve includes a generally tubular outer housing having an axially extending internal passageway including an internal seat and at least one generally radially extending opening formed through the housing intersecting the internal seat. A valve element is rotatably disposed within the internal passageway. The valve element has an axially extending internal bore and a head portion disposed at least partially within the internal seat. The head portion includes at least one generally radially extending seal element. The valve element has a first position relative to the housing, wherein the seal element is not aligned with the opening, thereby allowing fluid communication between the opening and the internal passageway. The valve element has a second position relative to the housing, wherein the seal element is aligned with the opening and wherein the seal element forms a metal-to-metal seal with the internal seat.

FIG. 4