METHOD AND APPARATUS FOR SECURING AND USING HYDRAJETTING TOOLS

BACKGROUND

The present disclosure relates generally to subterranean drilling operations and, more particularly, the present disclosure relates to a method and apparatus for securing and using hydrajetting tools.

Subterranean drilling operations typically include piercing a subterranean formation in order to release hydrocarbons (e.g., oil, gas, etc.) from the formation for retrieval at the surface. In some instances, after the borehole reaches the formation, or a pre-determined depth within the formation, the formation may be stimulated using well known procedures in the art. These procedures may be used to increase the production of hydrocarbons from the formation, and may include hydraulic fracturing, acidizing, and hydrajetting. Hydrajetting, for example, may use a focused or pinpointed stimulation operation, which stimulates narrow bands of the formation while limiting damage to surrounding areas. Unfortunately, hydrajetting tools may be difficult to secure when downhole, causing movement in the hydrajetting tool that may decrease the accuracy and effectiveness of the tool. After one zone of the formation has been stimulated with the hydrajetting tool, it may be necessary to plug that zone while the next zone is stimulated. Sand plugs may be used to isolate the stimulated zones, but placing the sand plugs can require a low flow rate that is difficult to maintain downhole. Existing approaches to restrict the flow are difficult to control and manufacture, and may become clogged as a result of setting the sand plug.

SUMMARY

According to a first aspect of the present invention, there is provided an apparatus for securing and using hydrajetting tools within a borehole, comprising: a housing, wherein the housing defines an inner bore; a flow limiting member disposed within the inner bore, wherein the flow limiting member comprises: a first jet in fluid communication with the top of the housing, a first chamber positioned below and in fluid communication with the first jet, and a first cavity aligned with the first jet and in fluid communication with the chamber; a groove disposed on an outer surface of the housing; and an anchor assembly axially slidable within the groove.

According to a second aspect of the present invention, there is provided a method for

securing and using hydrajetting tools within a borehole, comprising: introducing a housing into the borehole, wherein the housing defines an inner bore; axially securing the hydrajetting tool within the borehole using an anchor assembly disposed around the housing, wherein the anchor assembly is engaged with a groove disposed on an outer surface of the housing; and pumping a fluid into a flow limiting member axially secured within the inner bore, wherein the flow limiting member comprises: a first jet, a first chamber positioned below and in fluid communication with the first jet, and a first cavity aligned with the first jet and in fluid communication with the chamber.

According to a third aspect of the present invention, there is provided an apparatus for securing and using hydrajetting tools within a borehole, comprising: a housing, wherein the housing defines an inner bore; a flow limiting member axially secured and disposed within the inner bore, wherein the flow limiting member comprises: a first jet in fluid communication with the top of the housing, a first chamber positioned below and in fluid communication with the first jet, and a first cavity aligned with the first jet and in fluid communication with the chamber; a groove disposed on an outer surface of the housing; and an anchor assembly axially slidable and within the groove, wherein the anchor assembly comprises an anchor proximate the top of the anchor assembly and a pin disposed on an inner surface of the anchor assembly, wherein the pin is operable to engage with the groove.

18. The apparatus of claim ~~1~~17, wherein:
the flow limiting member comprises a plurality of segments;
a first segment of the plurality of segments comprises the first jet;
a second segment of the plurality of segments comprises the first cavity; and
the first chamber is defined in part by the first segment and the second segment.

19. The apparatus of claim 17, wherein the groove comprises a J-slot.

20. The apparatus of claim 17, wherein the anchor is operable to engage with the borehole when the pin is engaged with the groove, and disengage from the borehole when the housing is rotated and pulled axially upwards.