

Claims

What is claimed is:

1. A flow control device, adapted to be positioned in a wellbore, the flow control device comprising:

a housing, the housing defining a first internal passage, wherein the first internal passage defining a first internal surface in the housing, the first internal passage and the first internal surface extending concentrically along a first axis, the first internal surface being spaced apart from the first axis by a first distance; and

an internal recess defining a second internal surface in the housing, the second internal surface extending concentrically along the first axis and being spaced apart from the first axis by a second distance that is greater than the first distance; and

a flapper valve extending within the first internal passage, the flapper valve comprising:

a seat, the seat defining a second internal passage extending concentrically along a second axis, the second internal passage being adapted to permit passage of a downhole tool therethrough, and an external surface mated with the first internal surface of the housing, the external surface extending concentrically along a third axis; and

a flapper pivotably coupled to the seat,

wherein the second axis is offset from the first axis and the third axis; and wherein the flapper valve is actuable to an open configuration in which at least a portion of the flapper extends within the internal recess defined by the housing.

2. The flow control device of claim 1,

wherein the flapper is adapted to pivot away from the second axis by a distance of equal to or greater than a radius of the second internal passage when the flapper valve is in the open configuration, and wherein, when the flapper is pivoted away from the second axis by the distance of equal to or greater than the radius of the second internal passage, passage of the downhole tool through the second internal passage of the flapper valve is permitted.

3. The flow control device of claim 2,

wherein the offset of the second axis from the first axis and the third axis provides space for the flapper to be pivoted away from the second axis by the distance of equal to or greater than the radius of the second internal passage.

4. The flow control device of claim 2,

wherein the internal recess provides space for the flapper to be pivoted away from the second axis by the distance of equal to or greater than the radius of the second internal passage.

5. The flow control device of claim 2,

wherein the flapper includes one or more tapered surfaces, and

wherein the one or more tapered surfaces provide space for the flapper to be pivoted away from the second axis by the distance of equal to or greater than the radius of the second internal passage.

6. The flow control device of claim 1,

wherein:

one or more notches are formed in the seat and one or more internal protrusions are formed in the housing,

wherein the one or more internal protrusions formed in the housing are configured to matingly engage the one or more notches formed in the seat to obstruct rotation of the seat within the first internal passage; and/or

one or more notches are formed in the housing and one or more internal protrusions are formed in the seat,

wherein the one or more internal protrusions formed in the seat being configured to matingly engage the one or more notches formed in the housing to obstruct rotation of the seat within the first internal passage.

7. A method, comprising:

positioning a flow control device in a wellbore, the flow control device comprising:

a housing, the housing defining a first internal passage, the first internal passage defining a first internal surface in the housing, the first internal passage and the first internal surface extending concentrically along a first axis, the first internal surface being spaced apart from the first axis by a first distance; and

an internal recess defining a second internal surface in the housing, the second internal surface extending concentrically along the first axis and being spaced from the first axis by a second distance that is greater than the first distance; and

a flapper valve extending within the first internal passage, the flapper valve comprising:

a seat, the seat defining:

a second internal passage extending concentrically along a second axis; and

an external surface mated with the first internal surface of the housing, the external surface extending concentrically along a third axis; and

a flapper pivotable coupled to the seat;

pivoting the flapper valve to an open configuration in which at least a portion of the flapper extends within the internal recess defined by the housing; and

passing a downhole tool through the second internal passage defined by the seat when the flapper valve is in the open configuration,

wherein the second axis is offset from the first axis and the third axis.

8. The method of claim 7,

wherein the flapper is adapted to be pivoted away from the second axis by a distance of equal to or greater than a radius of the second internal passage when the flapper valve is in the open configuration, and

wherein, when the flapper is pivoted away from the second axis by the distance of equal to or greater than the radius of the second internal passage, movement of the downhole tool through the flapper valve is permitted.

9. The method of claim 8,

wherein the offset of the second axis from the first axis and the third axis provides space for the flapper to be pivoted away from the second axis by the distance of equal to or greater than the radius of the second internal passage.

10. The method of claim 8,

wherein the internal recess provides space for the flapper to be pivoted away from the second axis by the distance of equal to or greater than the radius of the second internal passage.

11. The method of claim 8,

wherein the flapper includes one or more tapered surfaces, and

wherein the one or more tapered surfaces provide space for the flapper to be pivoted away from the second axis by the distance of equal to or greater than the radius of the second internal passage.

12. A flapper valve, comprising:

a seat defining an internal passage extending concentrically along a first axis,

wherein the seat includes one or more external surfaces,

wherein at least one of the one or more external surfaces extends concentrically along a second axis,

wherein the second axis is offset from the first axis, wherein the seat further includes an internal tapered surface adapted to guide a downhole tool into the internal passage, and wherein the internal tapered surface extends concentrically along the second axis;

and a flapper pivotably coupled to the seat.

13. The flapper valve of claim 12,

wherein the flapper valve is actuable to:

an open configuration, in which the flapper valve permits fluid flow through the internal passage.

14. The flapper valve of claim 13,

wherein the flapper is adapted to be pivoted away from the first axis by a distance of equal to or greater than a radius of the internal passage when the flapper valve is in the open configuration, and wherein, when the flapper is pivoted away from the first axis by the distance of equal to or greater than the radius of the internal passage, movement of the downhole tool through the flapper valve is permitted.

15. The flapper valve of claim 14,

wherein the offset of the first axis from the second

axis provides space for the flapper to be pivoted away from the first axis by the distance of equal to or greater than the radius of the internal passage.

16. The flapper valve of claim 14,

wherein the flapper includes one or more tapered surfaces, and

wherein the one or more tapered surfaces provide space for the flapper to be pivoted away from the first axis by the distance of equal to or greater than the radius of the internal passage.