supported to prevent it from descending into the well bore. For this purpose, a “slips” is used.

Summary

[0005] The present disclosure provides for an automated pipe slips for supporting a tubular member. The automated pipe slips may include a slips body. The slips body may be generally annular and may have a tapered inner surface. The automated pipe slips may also include a plurality of wedges. The wedges may be positioned to slide along the tapered inner surface of the slips body. The wedges may alternate between short wedges and long wedges.

[0006] The present disclosure also provides for a method of supporting a tubular member. The method may include providing an automated pipe slips. The automated pipe slips may include a slips body. The slips body may be generally annular and may have a tapered inner surface. The automated pipe slips may also include a plurality of wedges. The wedges may be positioned to slide along the tapered inner surface of the slips body. The wedges may alternate between short wedges and long wedges. The method may also include suspending the tubular member within the automated pipe slips with a draw works; determining whether the tubular member has a diameter above or below a threshold diameter; extending the long wedges or the short wedges and long wedges to engage the tubular member; lowering the tubular member.

[0006A] According to a first aspect, there is provided _an automated pipe slips for supporting a tubular member, the automated pipe slips comprising: a slips body, the slips body being generally annular and having a tapered inner surface; a plurality of wedges, the wedges being positioned to slide along the tapered inner surface of the slips body, the wedges alternating between short wedges and long wedges; and a pipe wiper, the pipe

wiper including multiple wiper arms positioned radially about the slips body, each wiper arm adapted to pivot about a pivot point and extend inward to contact a tubular member so that any fluid or debris on an exterior surface of the tubular member may be wiped off, each wiper arm driven by a pneumatic cylinder, the wiper arm coupled to the slips body by the pneumatic cylinder and pivot point alone.

[0006B] According to a second aspect, there is provided a method of supporting a tubular member, the method comprising: providing an automated pipe slips, the automated pipe slips comprising: a slips body, the slips body being generally annular and having a tapered inner surface; a plurality of wedges, the wedges being positioned to slide along the tapered inner surface of the slips body, the wedges alternating between short wedges and long wedges; a pipe wiper, the pipe wiper including multiple wiper arms positioned radially about the slips body, each wiper arm adapted to pivot about a pivot point and extend inward to contact a tubular member so that any fluid or debris on an exterior surface of the tubular member may be wiped off, each wiper arm driven by a pneumatic cylinder, the wiper arm coupled to the slips body by the pneumatic cylinder and pivot point alone; suspending the tubular member within the automated pipe slips with a draw works; determining whether the tubular member has a diameter above or below a threshold diameter; extending the long wedges or the short wedges and long wedges to engage the tubular member; and lowering the tubular member.

Brief Description of the Drawings

[0007] The present disclosure is best understood from the following detailed description when read with the accompanying figures. It is emphasized that, in accordance with the standard practice in the industry, various features are not drawn to scale. In fact, the

Claims:

1. An automated pipe slips for supporting a tubular member, the automated pipe slips comprising:

    a slips body, the slips body being generally annular and having a tapered inner surface;

    a plurality of wedges, the wedges being positioned to slide along the tapered inner surface of the slips body, the wedges alternating between short wedges and long wedges; and

    a pipe wiper, the pipe wiper including multiple wiper arms positioned radially about the slips body, each wiper arm adapted to pivot about a pivot point and extend inward to contact a tubular member so that any fluid or debris on an exterior surface of the tubular member may be wiped off, each wiper arm driven by a pneumatic cylinder, the wiper arm coupled to the slips body by the pneumatic cylinder and pivot point alone.

2. The automated pipe slips of claim 1, wherein the slips body is separable into two or more slips subassemblies.

3. The automated pipe slips of claim 2, wherein the slips subassemblies are coupled using one or more slips assembly pins.

4. The automated pipe slips of claim 3, wherein adjacent slips subassemblies are adapted to pivot relative to each other if the one or more slips assembly pins are removed.

5. The automated pipe slips of claim 2, wherein each slips subassembly includes at least one wedge of the plurality of wedges.

6. The automated pipe slips of claim 2, wherein each slips subassembly includes one or more mating fingers, the mating fingers adapted to interlock with the mating fingers of adjacent slips subassemblies.

7. The automated pipe slips of claim 1, further comprising a cover assembly positioned at a top of the automated pipe slips.

8. The automated pipe slips of claim 7, wherein the cover assembly is adapted to pivotably open.

9. The automated pipe slips of claim 1, wherein the wedges are moved along the tapered inner surface of the slips body by one of a hydraulic piston, linear actuator, rack and pinion, or screw drive.

10. The automated pipe slips of claim 1, wherein the wedges slide along rails positioned on the tapered inner surface of the slips body.

11. The automated pipe slips of claim 1, wherein the wedges further comprise a primary wedge and a secondary wedge, the primary wedge adapted to slide along the tapered inner surface of the slips body, and the secondary wedge adapted to slide along a secondary angled surface formed between the primary wedge and the secondary wedge wherein the secondary angled surface is more vertical than the tapered inner surface of the slips body.

12. The automated pipe slips of claim 11, wherein the wedges further comprise a return spring adapted to motivate the secondary wedge upward along the secondary angled surface.

13. The automated pipe slips of claim 1, wherein the wedges further comprise one or more dies adapted to interface with an outer surface of the tubular member.

14. The automated pipe slips of claim 13, wherein the dies are retained in one or more die grooves formed in the wedges.

15. The automated pipe slips of claim 14, wherein the dies are retained in the die grooves by a die retention plate.

16. The automated pipe slips of claim 1, wherein the wedges further comprise a secondary locking feature.

17. The automated pipe slips of claim 16, wherein the secondary locking feature comprises at least one of a ball-grip system, hydraulic cylinder, accumulator, and mechanized cam.

18. The automated pipe slips of claim 1, wherein the long wedges are selectively actuatable independent of the short wedges.

19. The automated pipe slips of claim 18, wherein the long wedges are actuated for gripping a tubular member having diameter smaller than a threshold diameter and both long and short wedges are actuated for gripping a tubular member having a diameter larger than the threshold diameter.

20. The automated pipe slips of claim 1, wherein the short wedges are wider than the long wedges.

21. The automated pipe slips of claim 1, further comprising a tubular centralizer, the tubular centralizer including multiple centering arms positioned radially about the

slips body, each centering arm positioned to pivot about a pivot point and extend inward so that a tubular member is centered within the pipe slips body.

22. The automated pipe slips of claim 21, wherein each centering arm is driven by one of a hydraulic motor, electric motor, or hydraulic piston.

23. The automated pipe slips of claim 1, wherein each wiper arm comprises a wiper blade.

24. The automated pipe slips of claim 23, wherein each wiper blade is pivotably coupled to the wiper arm.

25. The automated pipe slips of claim 23, wherein each wiper blade comprises an inner blade and an outer blade, the inner blade being generally more compliant than the outer blade such that the inner blade more easily conforms to an outer profile of the tubular member.

26. A method of supporting a tubular member, the method comprising:

providing an automated pipe slips, the automated pipe slips comprising:

a slips body, the slips body being generally annular and having a tapered inner surface;

a plurality of wedges, the wedges being positioned to slide along the tapered inner surface of the slips body, the wedges alternating between short wedges and long wedges;

a pipe wiper, the pipe wiper including multiple wiper arms positioned radially about the slips body, each wiper arm adapted to pivot about a pivot point and extend inward to contact a tubular member so that any fluid or debris on an

exterior surface of the tubular member may be wiped off, each wiper arm driven by a pneumatic cylinder, the wiper arm coupled to the slips body by the pneumatic cylinder and pivot point alone;

suspending the tubular member within the automated pipe slips with a draw works;

determining whether the tubular member has a diameter above or below a threshold diameter;

extending the long wedges or the short wedges and long wedges to engage the tubular member; and

lowering the tubular member.

27. The method of claim 26, wherein both the short wedges and long wedges are extended for a tubular member having a diameter above the threshold diameter, and only the long wedges are extended for a tubular member having a diameter below the threshold diameter.