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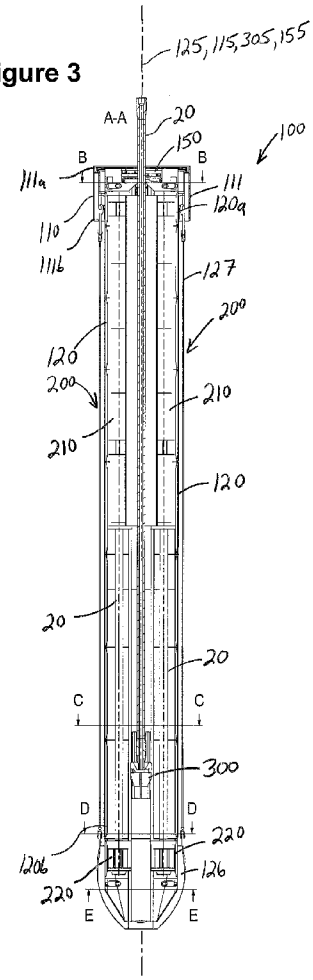
[Continued on next page]

(54) Title: A DRILLING SYSTEM AND A DEVICE FOR ASSEMBLING AND DISASSEMBLING PIPE STANDS

Figure 3



(57) Abstract: A system for storing one or more tubulars comprises a drilling deck (14) including a hole (17) offset from a wellbore centerline (18). In addition, the system comprises a rack unit (100) coupled to the drilling deck and extending downward from the hole in the drilling deck. The rack unit comprises a tubular housing (111) having a longitudinal axis, an upper end, and a lower end opposite the upper end. The rack unit also comprises a first rack (200) disposed within the housing, wherein the first rack is moveably coupled to the housing.

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AMENDED CLAIMS
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1. A rack unit for storing one or more tubulars through a hole offset from a wellbore centerline on a drilling deck, the rack unit comprising:

a tubular housing having a longitudinal axis, an upper end, and a lower end opposite the upper end, wherein the tubular housing defines a loading/unloading position for one or more tubulars;

a first rack disposed within the housing, wherein the first rack is moveably coupled to the housing;

a second rack disposed within the housing, wherein the second rack is moveably coupled to the housing;

wherein the first rack is configured to move between the loading/unloading position and a first storage position laterally offset from the loading/unloading;

wherein the second rack is configured to move independent of the first rack between the loading/unloading position and a second storage position laterally offset from the loading/unloading position and laterally offset from the first storage position.

2. (Cancelled).

3. The rack unit of claim 1, wherein the tubular housing of the rack unit is stationary with respect to the drilling deck.

4. The rack unit of claim 1, wherein the rack unit further comprises:

an elevator disposed in the housing, wherein the elevator is configured to be moved axially up and down relative to the housing.

5. The rack unit of claim 1, wherein the first rack is pivotally coupled to the housing and is configured to rotate about a first axis that is parallel to the longitudinal axis of the housing and radially offset from the longitudinal axis of the housing;

wherein the second rack is pivotally coupled to the housing and is configured to rotate about a second axis that is parallel to the longitudinal axis of the housing and radially offset from the longitudinal axis of the housing and from the first axis.

6. The rack unit of claim 5, wherein each rack comprises:

an upper guide and a lower guide axially positioned below the upper guide;

wherein the upper guide comprises a tubular body having a central axis, an upper end, a lower end, and a through slot extending axially between the upper end and the lower end;

wherein the lower guide comprises a tubular body having a central axis coaxially aligned with the central axis of the upper guide, an upper end, a lower end, and a through slot extending axially between the upper end and the lower end.

7. The rack unit of claim 6, wherein each rack comprises a cradle moveably disposed in the tubular body of the lower guide, wherein each cradle is configured to receive the lower end of a tubular and is seated on an annular shoulder in the lower end of the tubular member of the corresponding lower guide.

8. The rack unit of claim 7, wherein the rack unit further comprises an elevator disposed in the housing, wherein the elevator is configured to be moved axially up and down relative to the housing;

wherein the elevator includes a cup-shaped support member configured to receive the lower end of a tubular and an extension arm extending radially from the support member;

wherein the tubular body of each upper guide and the tubular body of each lower guide is configured to slidingly receive the support member;

wherein the slot in each upper member and the slot in each lower member is configured to slidingly receive the extension arm.

9. The rack unit of claim 1, further comprising:

a mounting assembly attached to the drilling deck and the upper end of the housing;

a capture basket disposed at the lower end of the housing and configured to catch a tubular falling through the lower end of the housing.

10. The rack unit of claim 4, wherein the first rack has a first position coaxially aligned with a support member of the elevator and a second position radially offset from the support member;

wherein the second rack has a first position coaxially aligned with a support member of the elevator and a second position radially offset from the support member.

11. A method for constructing a pipe stand, the method comprising:

(a) positioning a rack unit below a hole in a drilling deck, wherein the rack unit comprises a tubular housing having a longitudinal axis, a first rack disposed in the housing, a second rack disposed in the housing, and an elevator disposed in the housing;

(b) moving the first rack relative to the housing from a first position laterally offset from the elevator to a second position coaxially aligned with the elevator;

(c) moving the elevator axially upward through at least a portion of the first rack;

(d) inserting a first pipe joint through the hole into the first rack;

(e) supporting the first pipe joint in the first rack with the elevator; and

(f) lowering the first pipe joint into the first rack with the elevator.

(g) moving the second rack from a third position laterally offset from the elevator to the second position coaxially aligned with the elevator; wherein the movement of the second rack is independent of the movement of the first rack.

12. The method of claim 11, further comprising:

maintaining the first rack in the second position during (d), (e), and (f).

13. The method of claim 12, further comprising:

moving the first rack from the second position to the first position with the first pipe joint therein after (d), (e), and (f) and before (g).

14. The method of claim 13, further comprising:

(h) moving the elevator axially upward through at least a portion of the second rack;

(i) inserting a second pipe joint through the hole into the second rack;

(j) supporting the second pipe joint in the second rack with the elevator; and

(k) lowering the second pipe joint into the second rack with the elevator.

15. The method of claim 14, further comprising:

maintaining the second rack in the second position during (h), (i), (j), and (k).

16. The method of claim 15, further comprising:

moving the second rack from the second position to the third position with the second pipe joint therein after (k).

17. The method of claim 15, further comprising:

(l) moving the elevator axially upward in the housing of the rack unit between the first rack and the second rack;

(m) inserting a third pipe joint through the hole into the housing of the rack unit;

(n) supporting the third pipe joint in the housing of the rack unit with the elevator; and

(o) lowering the third pipe joint into the housing of the rack unit with the elevator.

18. The method of claim 12, wherein (b) comprises moving the first rack linearly from the first position to the second position.

19. The method of claim 12, wherein (b) comprises rotating the first rack relative to the housing about a first axis of rotation that is offset from the longitudinal axis of the housing from the first position to the second position.

20. The method of claim 15, wherein (b) comprises rotating the first rack relative to the housing about a first axis of rotation that is offset from the longitudinal axis of the housing from the first position to the second position;

wherein (g) comprises rotating the second rack relative to the housing about a second axis of rotation that is offset from the longitudinal axis of the housing from the third position to the second position.

21. The method of claim 20, wherein each rack comprises an upper tubular guide and a lower tubular guide;

wherein the first rack is rotated between the first position and the second position by a first actuator that rotates the upper tubular guide of the first rack and a second actuator that rotates the lower tubular guide of the first rack;

wherein the second rack is rotated between the third position and the second position by a third actuator that rotates the upper tubular guide of the second rack and a fourth actuator that rotates the lower tubular guide of the second rack.

22. The method of claim 21, wherein the first actuator and the second actuator are synchronized to rotate the upper tubular guide and the lower tubular guide of the first rack together; and

wherein the third actuator and the fourth actuator are synchronized to rotate the upper tubular guide and the lower tubular guide of the second rack together.

23. A system for storing one or more tubulars, the system comprising:

a drilling deck including a hole offset from a wellbore centerline;

a rack unit coupled to the drilling deck and extending downward from the hole in the drilling deck;

wherein the rack unit comprises:

a housing having a vertical longitudinal axis, an upper end, a lower end opposite the upper end, and a common loading/unloading position for one or more tubulars;

a first rack disposed within the housing and configured to receive a tubular, wherein the first rack includes a[[n]] first upper guide pivotally coupled to the housing and a first lower guide pivotally coupled to the housing, wherein the first upper guide and the first lower guide of the first rack are configured to pivot about a first rotational axis;

a second rack disposed within the housing and configured to receive a tubular, wherein the second rack includes a second upper guide pivotally coupled to the housing and a second lower guide pivotally coupled to the housing, wherein the second upper guide and the second lower guide of the second rack are configured to pivot about a second rotational axis that is parallel to and offset from the first rotational axis; and

an elevator disposed within the housing and configured to move axially up and down within the housing;

wherein the first rack is configured for rotation between a first storage position and the common loading/unloading position;

wherein the second rack is configured for rotation between a second storage position and the common loading/unloading position, independently of the first rack; and

wherein the first rack and the second rack are configured to occupy the common loading/unloading position separately.

24. The system of claim 23, wherein the upper guide of the first rack comprises a tubular body and the lower guide of the first rack comprises a tubular body coaxially aligned with the tubular body of the upper guide of the first rack.

25. The system of claim 24, wherein the tubular body of the upper guide of the first rack has an upper end, a lower end, and a slot extending axially from the upper end to the lower end; and

wherein the tubular body of the lower guide of the first rack has an upper end, a lower end, and a slot extending axially from the upper end to the lower end.

26. (Cancelled).

27. The system of claim 23, wherein the upper guide of the second rack comprises a tubular body and the lower guide of the second rack comprises a tubular body coaxially aligned with the tubular body of the upper guide of the second rack.

28. The system of claim 27, wherein the tubular body of the upper guide of the second rack has an upper end, a lower end, and a slot extending axially from the upper end to the lower end; and

wherein the tubular body of the lower guide of the second rack has an upper end, a lower end, and a slot extending axially from the upper end to the lower end.

29. The rack unit of claim 9, further comprising a plurality of circumferentially spaced connecting lines suspending the capture basket from the mounting assembly.

30. The rack unit of claim 1, wherein the first rack is configured to move while the second rack is in the second storage position, and the second rack is configured to move independently of the first rack while the first rack is in the first storage position.

31. The rack unit of claim 1 wherein the rack unit is coupled to and extends downward from the drilling deck; and

wherein the rack unit is configured for loading and unloading one or more tubulars through a hole in the drilling deck.