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(54) Title: DEEPWATER COMPLETION INSTALLATION AND INTERVENTION SYSTEM

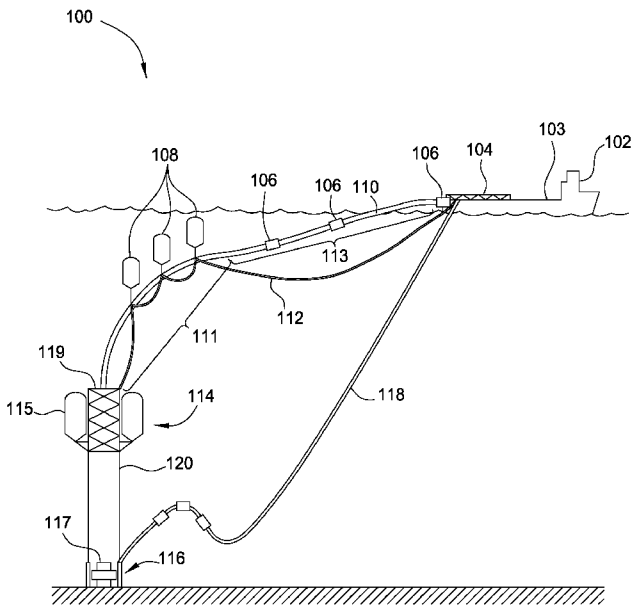

FIG. 1A

(57) Abstract: Methods and apparatus for installing deepwater completions and performing well intervention from a "non-dedicated" vessel that can perform other duties while not running completions or performing interventions. The system for installing deepwater completions and performing well intervention may comprise a surface pipe handling and deployment package including a horizontally operated rig that may also be operated in a slanted mode. Deepwater completions may be deployed from the non-dedicated vessel via a buoyant horizontal riser (BHR), which may be supported by a submerged buoyant tensioning system (BTS). In this manner, the cost of performing completion or intervention operations may be significantly reduced compared to such operations run from a drilling rig.

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AMENDED CLAIMS
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Claims:

1. A method of deploying, from a vessel, apparatus for hydrocarbon operations, comprising:

operating a rig disposed on the vessel at a substantially horizontal angle with respect to a deck of the vessel; and

deploying the apparatus from the vessel via the rig at the substantially horizontal angle.

2. The method of claim 1, wherein deploying the apparatus comprises deploying a buoyant tensioning system (BTS), wherein the BTS is for deploying and retrieving subsea components from a wellhead.

3. The method of claim 2, wherein deploying the apparatus comprises deploying a buoyant horizontal riser (BHR) after deploying the BTS, wherein the BHR is substantially horizontal at or near the rig.

4. The method of claim 3, wherein deploying the BHR comprises curving a portion of the BHR, wherein the BHR is substantially vertical at or near the BTS.

5. The method of claim 4, wherein curving the portion of the BHR comprises inflating or deflating one or more buoys affixed to at least one of the BHR and the BTS.

6. The method of claim 3, wherein deploying and retrieving the subsea components from the wellhead comprises latching the BHR to one of the subsea components.

7. The method of claim 3, wherein deploying and retrieving the subsea components from the wellhead comprises latching a riser to one of the subsea components, wherein the riser is run through the BHR from the vessel.

8. The method of claim 3, further comprising performing wireline or coiled tubing operations through the BHR.

9. The method of claim 1, wherein the vessel comprises a non-dedicated vessel.

10. A buoyant tensioning system (BTS) for deploying and retrieving subsea components from a wellhead, comprising:

a frame;

one or more buoys coupled to the frame;

an apparatus for coupling the frame to the wellhead; and

a connection point for coupling the BTS to a vessel via a buoyant horizontal riser (BHR).

11. The BTS of claim 10, wherein the one or more buoys comprise inflatable buoys.

12. The BTS of claim 11, further comprising a control line for inflating or deflating the inflatable buoys.

13. The BTS of claim 10, wherein the one or more buoys comprise at least one of a ring buoy or a U-buoy.

14. The BTS of claim 10, wherein the one or more buoys are arranged in at least one of a vertical or a diagonal configuration with respect to the frame.

15. The BTS of claim 10, wherein the apparatus comprises a tension cable or a riser.

16. The BTS of claim 10, further comprising a joint coupled to the frame for eliminating heave.

17. The BTS of claim 10, wherein the connection point comprises a pivot point for the BHR.

18. A vessel, comprising:

a deck; and

a rig configured to deploy apparatus for subsea hydrocarbon operations at a substantially horizontal angle with respect to the deck.

19. The vessel of claim 18, further comprising a grid coupled to the deck.

20. The vessel of claim 19, wherein at least some of the apparatus are routed through pre-existing holes in beams of the grid before deployment.

21. The vessel of claim 19, wherein at least some of the apparatus are arranged on the grid in pre-designated locations and locked into place on the grid before deployment.

22. The vessel of claim 18, wherein the vessel is a non-dedicated vessel.

23. A system, comprising:

a vessel for deploying apparatus for subsea hydrocarbon operations at a less than vertical angle with respect to a deck of the vessel;

a buoyant tensioning system (BTS) for coupling to a subsea wellhead; and

a buoyant horizontal riser (BHR) coupled between the BTS and the vessel for routing the apparatus between the vessel and the wellhead.

24. The system of claim 23, wherein the BHR comprises a straight section.

25. The system of claim 24, wherein a curve of the BHR is controlled by one or more first buoys.

26. The system of claim 25, wherein the straight section of the BHR is supported by one or more second buoys.

27. The system of claim 26, wherein the second buoys are disposed under the straight section.

28. The system of claim 25, wherein the straight section of the BHR is supported by a tension cable coupled to a mast on the vessel.

29. The system of claim 23, further comprising a cable or a riser for coupling the BTS to the wellhead.