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Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a
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(54) Title: MULTI PURPOSE BOTTOM SUPPORTED MOBILE OFFSHORE SERVICE PLATFORM AND METHOD

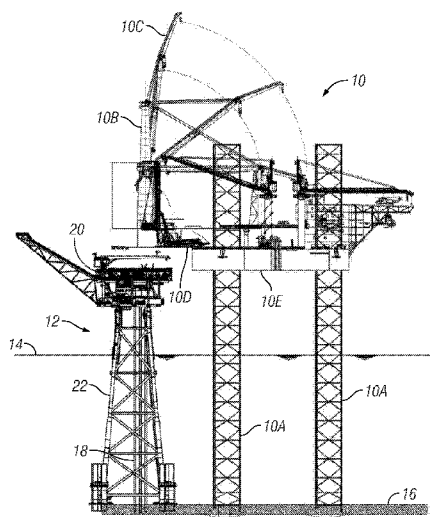


FIG. 1

(57) Abstract: A method for abandonment of a production platform includes moving a mobile offshore service platform (MOSP) to a position proximate the production platform. A hull of the MOSP is raised to a selected elevation above a top of the production platform. A cantilever structure having thereon a drilling unit and a crane is extended from a retracted position over the hull until the drilling unit is positioned over at least one well on the production platform. The well is plugged. The cantilever structure is then moved so that the crane is positioned to lift components from the production platform during disassembly of the production platform.



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- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*
- Published:**
- *with international search report (Art. 21(3))*

MULTI PURPOSE BOTTOM SUPPORTED MOBILE OFFSHORE SERVICE PLATFORM AND METHOD

Background

[0001] This disclosure relates to the field of mobile offshore service units. More specifically, the disclosure relates to bottom supported mobile offshore platforms that are equipped to perform multiple types of well and platform operations in a body of water.

[0002] Bottom supported mobile offshore drilling units (MODUs) such as “jack up” rigs are known in the art for use in plugging and abandonment procedures for wells drilled beneath a body of water. In plugging and abandonment procedures known in the art, a jack up rig drilling may be moved to a location of a production platform such as a bottom supported platform. The jack up hull is raised out of the water by jacking support legs coupled to the hull of the drilling unit the hull is raised to a selected elevation above the water surface. A cantilever structure comprising a drilling unit may be extended from a retracted position over the hull to an extended position over a recess in the profile of the hull and over the production platform. A conventional drilling unit disposed on the cantilever structure may then be used to perform plugging and abandonment operations for any one or more wells connected to the production platform or located proximate the production platform. Plugging and abandonment operations may comprise removing production tubing from a well, setting one or more sealing plugs in the well and removing any ancillary equipment from the well, for example, a surface riser that extends from the water bottom to the production platform.

[0003] When all wells associated with a particular production platform are plugged and abandoned, the production platform may be subsequently removed. Using equipment known in the art such as a conventional jack up MODU it is necessary to move the MODU away from the production platform and to send a different type of marine vessel to the location of the production platform for subsequent disassembly and removal.

Brief Description of the Drawings

- [0004] FIG. 1 shows a side elevation view of a bottom-supported mobile offshore service platform (MOSP) being used to perform plugging operations on wells connected to a production platform.
- [0005] FIG. 2 shows a side elevation view of the MOSP wherein a cantilever structure is moved so that a crane disposed on the cantilever structure may commence disassembly and removal operations on the production platform.
- [0006] FIG. 3 shows a side elevation view of the MOSP wherein the crane is commencing production platform removal operations.
- [0007] FIG. 4 shows a top view of the MOSP with the cantilever structure extended so a drilling mast is disposed over a well center on the production platform for plugging and abandonment operations.
- [0008] FIG. 5 shows a top view of the MOSP with the cantilever structure retracted so the crane thereon can begin production platform removal operations.

Detailed Description

- [0009] FIG. 1 shows a side elevation view of a bottom supported mobile offshore service platform ("MOSP") 10 according to the present disclosure being used to perform plugging and abandonment operations in wells drilled below the bottom 16 of a body of water ("water bottom") connected to or associated with a production platform 12. FIG. 1 shows subsequent disassembly and removal operations on the production platform 12. The MOSP 10 may be moved to the location of the production platform 12 by moving a hull 10E of the MOSP 10 along the surface 14 of the body of water. The hull 10E may be self-powered or may be towed by one or more towing vessels (not shown). When the MOSP 10 is disposed at a location proximate the production platform 12, support legs 10A may be lowered to the water bottom 16 and the hull 10E may be lifted to a selected elevation above the water surface 14. Lowering the support legs 10A may be performed using any known device for such purpose, including without limitation an electric or hydraulic jacking motor associated with each support leg 10A, each such motor having, for example, a pinion gear engaged with a toothed rack coupled to the support leg 10A.

See, for example, U.S. Patent No. 7,886,845 issued to King et al. The selected hull 14 elevation will typically be sufficient so that a cantilever structure 10D on the MOSP 10 may be extended from a retracted position over the hull 10E to an extended position such that a drilling unit 10B of types known in the art may be positioned over the production platform 12 for performing plugging operations on one or more wells connected to the production platform 12. In the present example embodiment, the cantilever structure 10D may include both the drilling unit 10B and a crane 10C.

[0010] In other embodiments, the cantilever structure 10D may comprise only the drilling unit 10B prior to refitting the MOSP 10 to be usable with methods according to the present disclosure. For example, the MOSP 10 may be a conventional “jack up” type mobile offshore drilling unit having a drilling unit 10B on the cantilever structure 10D but excludes a crane on the cantilever structure 10D (although other components explained below may be present on such a cantilever structure). In preparing a mobile offshore drilling unit for performing methods according to the present disclosure, the cantilever structure 10D may have a crane, e.g., as shown at 10C attached to the existing cantilever structure 10D at a shipyard or similar facility. In other embodiments, the cantilever structure 10D of an existing jack up drilling unit may be replaced entirely. i.e., as a unit, with a cantilever structure 10D having both the drilling unit 10B and the crane 10C fitted thereto prior to assembly of the cantilever structure 10D to the MOSP 10. In some embodiments, wherein the cantilever structure 10D is replaced as a unit, the original cantilever structure excluding the crane and the replacement cantilever structure including the crane 10C may have the same type of attachment components to attach the cantilever structures to the MOSP 10. Such arrangement may reduce the cost of refitting an existing jack up drilling unit to perform methods according to the present disclosure.

[0011] In some embodiments, the cantilever structure 10D may also include other devices, for example a wireline well intervention unit, a coiled tubing unit and personnel accommodation devices (none shown in the drawings).

[0012] In the present example embodiment, the wells may be connected to equipment (not shown separately) on the production platform 12 by risers 18, which in some

embodiments may be extensions of a surface casing (not shown) disposed in each well. The production platform 12 may itself be bottom supported, e.g., by a structure 22 referred to as a “jacket.” The cantilever structure 10D may be extended and “skidded” in a direction transverse to the extension direction so that the drilling unit 10B may have its central operating axis (“drill center”) positioned over any one of the wells connected to the production platform 12. The production platform 12 may include surface equipment 20 such as production processing equipment, personnel quarters and other devices associated with bottom supported marine oil and gas production processing.

[0013] After well plugging operations have been completed at the production platform 12, the MOSP 10 may remain at the same geodetic location with the hull 10A remaining elevated at the selected elevation. At such time, the MOSP 10 may be reconfigured for disassembly and removal of part or all of the production platform 12. FIG. 2 shows a side elevation view of the MOSP 10 wherein the cantilever structure 10D is retracted partially from its extended position. In such position, the drilling unit 10B mast or derrick may be lowered, for example, by retraction of a vertically telescoping mast structure to provide additional working clearance for the crane 10C.

[0014] FIG. 3 shows a side elevation view of the MOSP 10 wherein the cantilever structure 10D is extended again from the hull 10E such that the crane 10C is positioned to commence production platform 12 disassembly and removal operations. The path traversed by the crane 10C is shown by arcuate segments 11A and 11B which display the position of each of two sheave blocks 13A, 13B as the crane 10C is rotated through its available movement range. An intermediate position of the crane 10C is shown at 10C1; a final position wherein the crane 10C may begin lifting components from the production platform 12 is shown at 10C2. In the final position 10C2, one of the crane sheave blocks, e.g., 13A may be positioned, for example, over a flare boom 12A on the production platform 12 so that the flare boom 12A may be lifted from the production platform 12 by the crane 10C. It should be understood that the crane 10C is operable at any amount of extension of the cantilever structure 10D between its fully retracted and fully extended positions. The crane 10C is shown fully in the various above described positions 10C1, 10C2 to illustrate the crane 10C and cantilever structure 10D at each of the positions

10C1, 10C2 and should not be construed as illustrating multiple cranes attached to the cantilever structure 10D at the same location on the cantilever structure 10D.

[0015] It is contemplated that components removed from the production platform 12, and the jacket 22, if the operator uses the MOSP 10 for such purpose, may be moved to a transport vessel (not shown). In some embodiments, depending on the variable deck load capacity of the MOSP 10, some or all of the components removed from the production platform 12 and/or the jacket 22 may be placed in suitable storage devices (not shown) on the hull 10E or onto a deck surface of the hull 10E. All of the foregoing are within the scope of the present disclosure.

[0016] FIG. 4 shows a top view of the MOSP with the cantilever structure 10D extended from the hull 10E so the drilling unit 10B is disposed over a well center on the production platform 20 for plugging operations.

[0017] FIG. 5 shows a top view of the MOSP 10 with the cantilever structure 10D partially retracted so the crane 10C thereon can be used in connection with production platform 12 disassembly and removal operations as described above.

[0018] While the invention has been described with respect to a limited number of embodiments, those skilled in the art, having benefit of this disclosure, will appreciate that other embodiments can be devised which do not depart from the scope of the invention as disclosed herein. Accordingly, the scope of the invention should be limited only by the attached claims.

Claims

What is claimed is:

1. A method for abandonment of a production platform, comprising:
moving a mobile offshore service platform (MOSP) to a position proximate the production platform;
raising a hull of the MOSP to a selected elevation above a top of the production platform;
extending a cantilever structure having thereon a drilling unit and a crane from a position over the hull until the drilling unit is positioned over at least one well on the production platform;
plugging the at least one well; and
moving the cantilever structure so that the crane is positioned to lift components from the production platform during disassembly of the production platform.
2. The method of claim 1 wherein the raising the hull comprises extending a plurality of jacking legs to a bottom of a body of water and continuing the extending until the hull is raised to the selected elevation above a surface of the body of water.
3. The method of claim 1 further comprising, after plugging the at least one well, retracting the cantilever structure onto the hull and lowering a mast of the drilling unit prior to moving the cantilever to position the crane.
4. The method of claim 1 wherein the cantilever structure further comprises at least one of a wireline well intervention unit, a coiled tubing unit and personnel accommodation devices.
5. The method of claim 1 wherein the cantilever structure initially comprises the drilling unit and excludes a crane, and wherein the crane is affixed to the cantilever structure prior to commencement of lifting components.
6. The method of claim 5 wherein the cantilever structure initially excluding the crane is removed from the MOSP as a unit.

7. The method of claim 5 wherein the cantilever structure having thereon a drilling unit and a crane is attached to the MOSP as a unit.
8. The method of claim 5 wherein the cantilever structure excluding the crane and the cantilever structure having the crane each have the same type of attachment components to connect the respective cantilever structures to the MOSP.

1/5

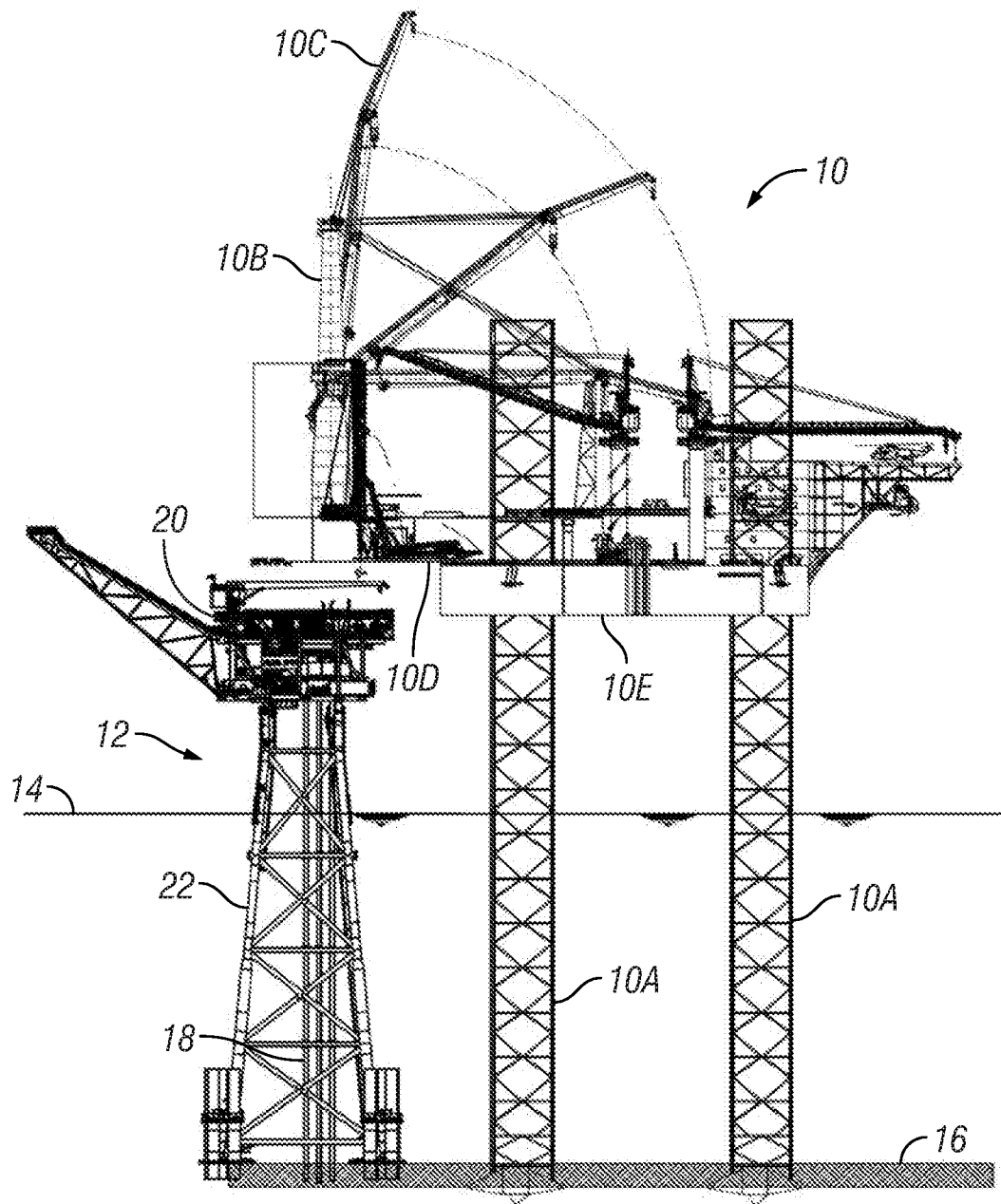


FIG. 1

2/5

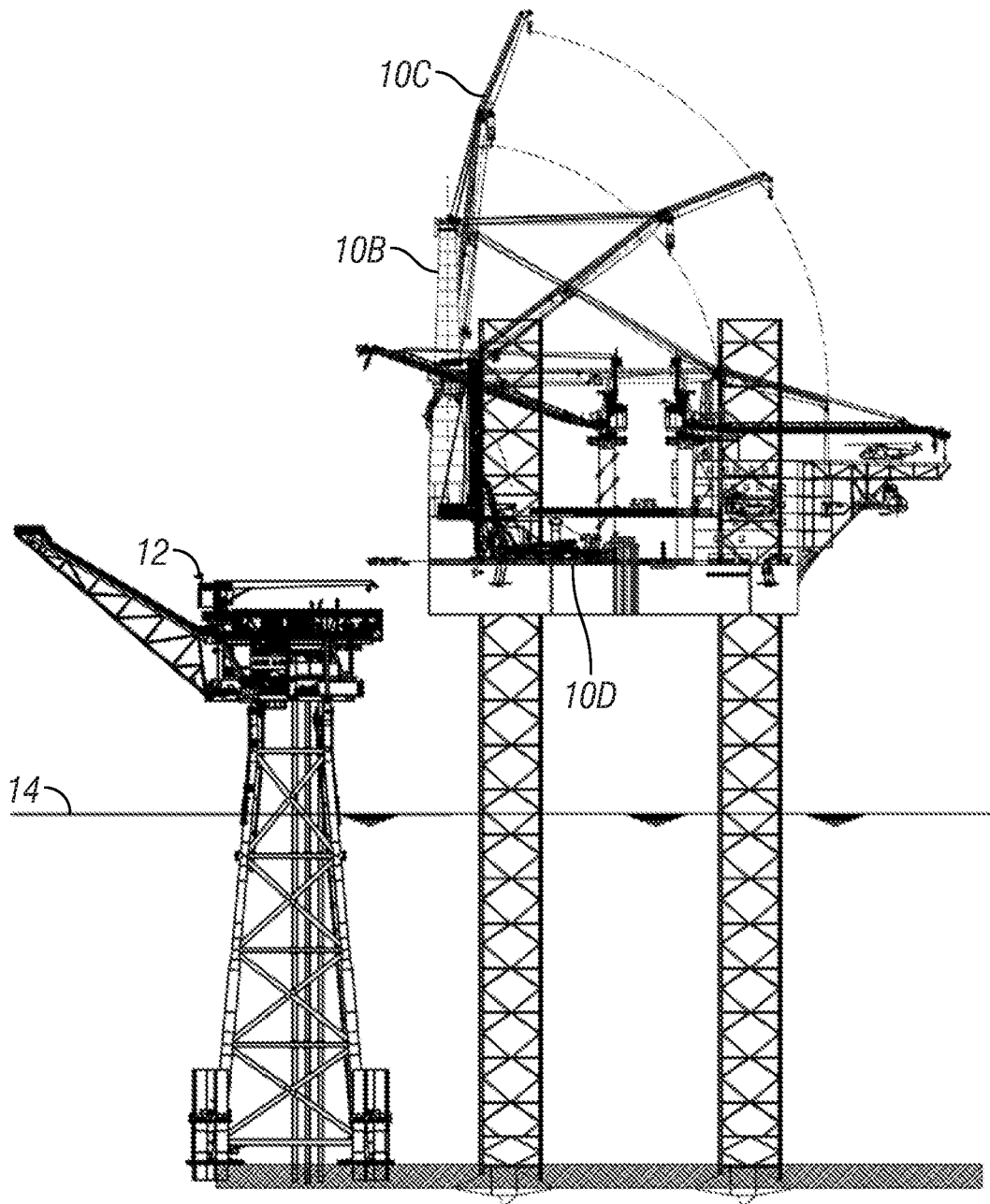


FIG. 2

3/5

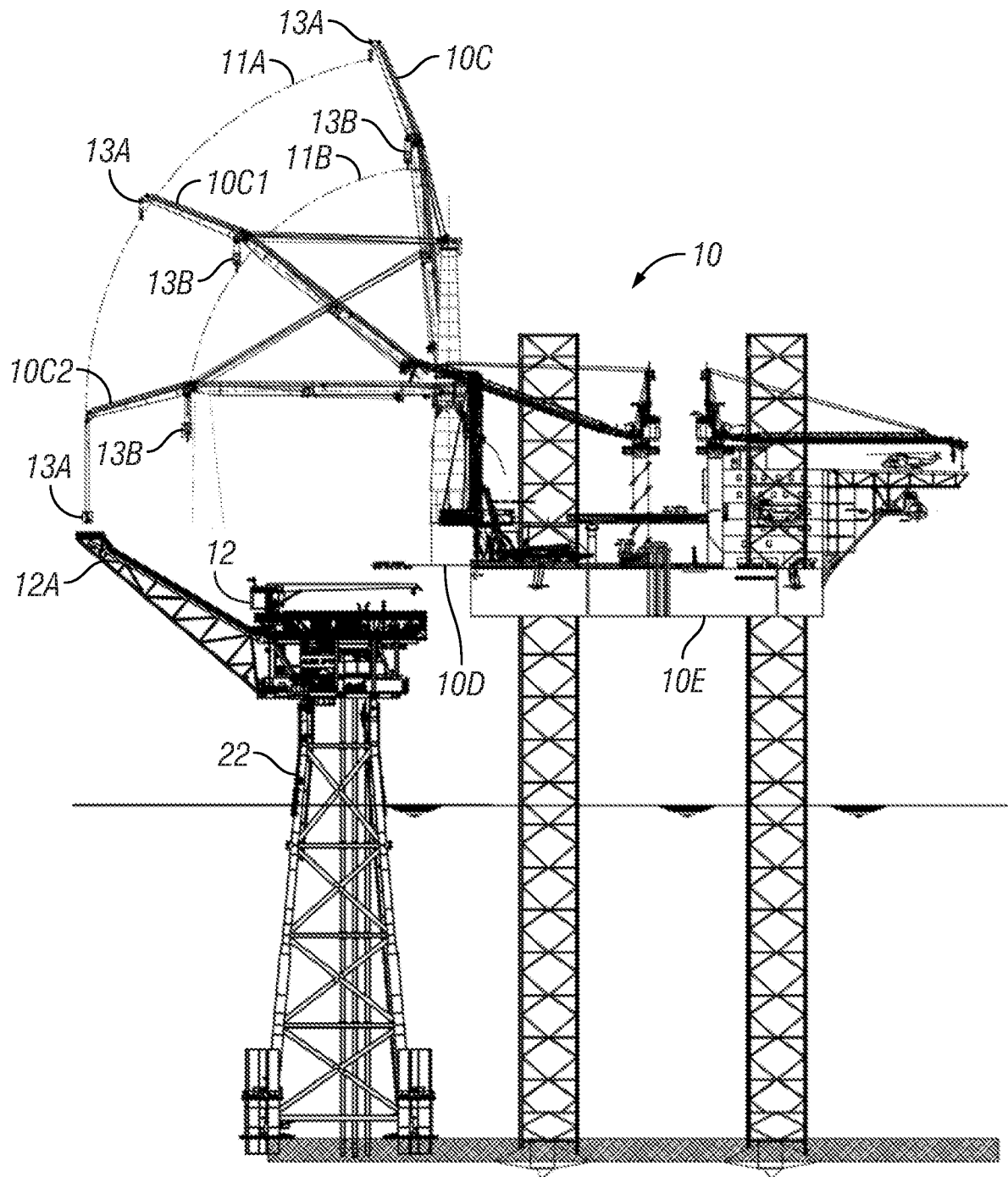


FIG. 3

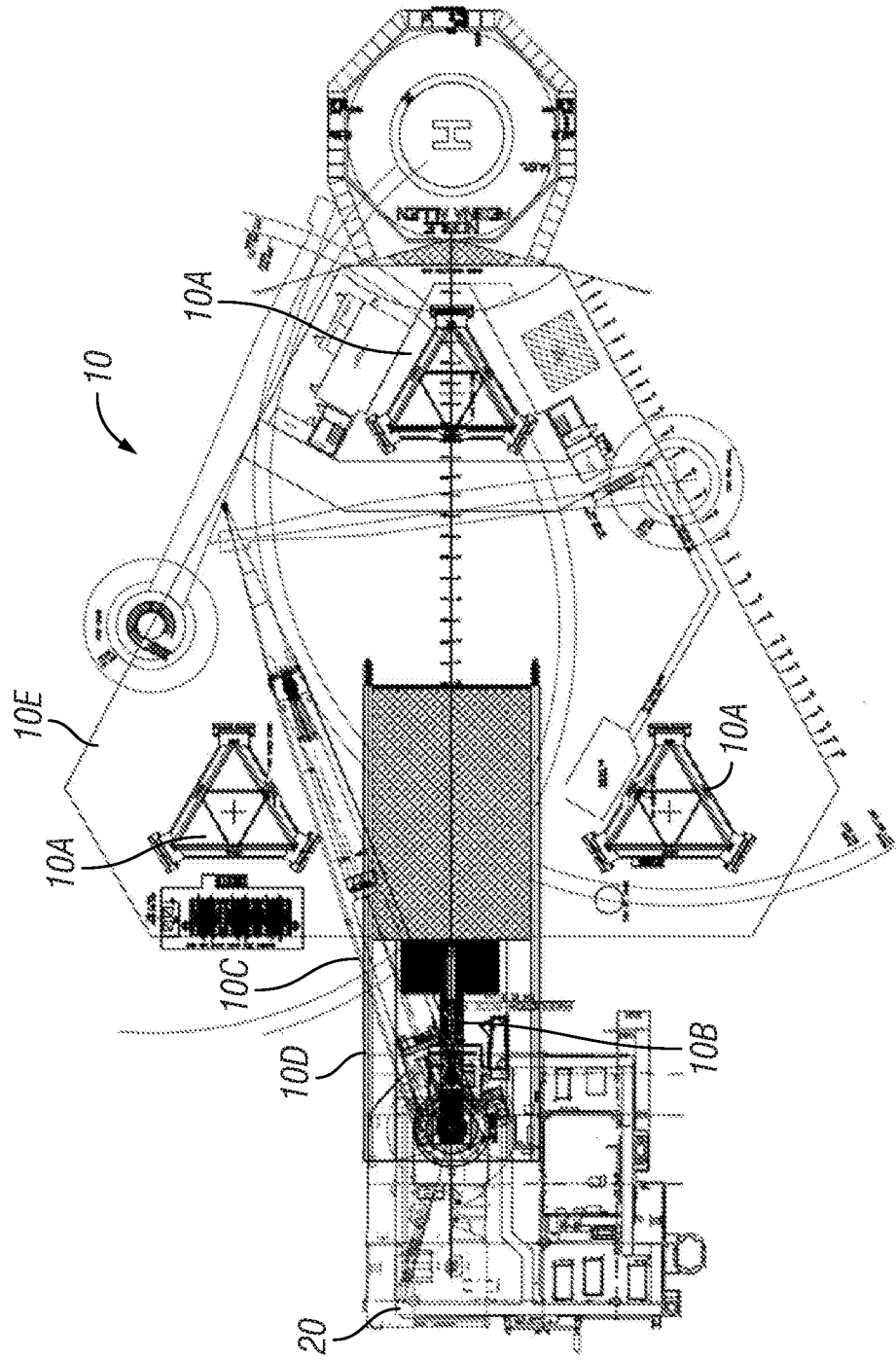


FIG. 4

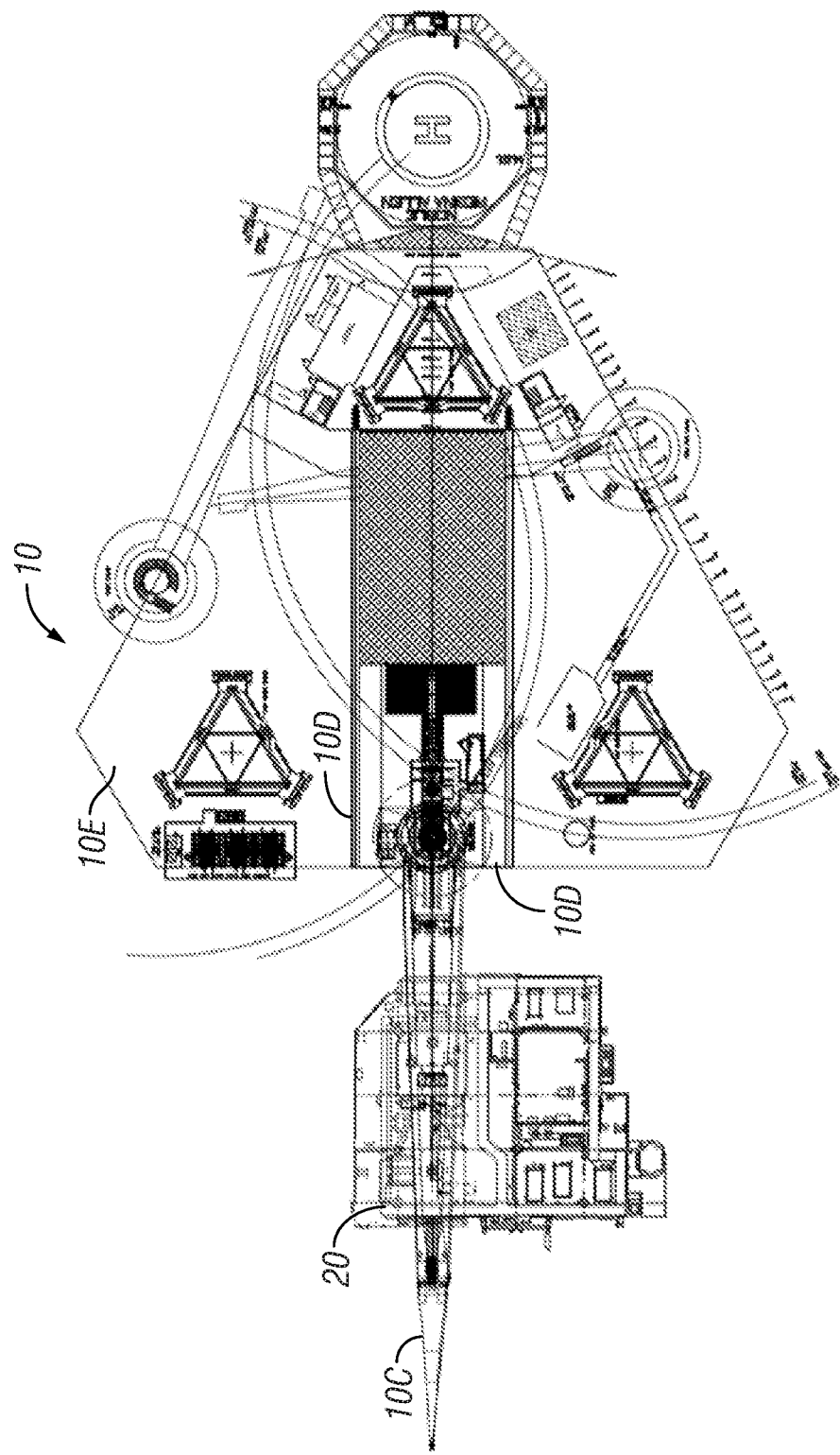


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 17/17953

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B63B 35/44 (2017.01)

CPC - B63B 35/44, B63B 35/4406, E02B 17/04, E02B 17/021

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History Document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2012/144952 A1 (PRIMEPOINT PTE LTD) 26 October 2012 (26.10.2012), entire document, especially Fig 3-4, 9-12; pg 5, ln 36-37; pg 6, ln 1-11, 23-31; pg 7, ln 19-29; pg 9, ln 1-32; pg 10, ln 1-9, 14-18, 29-37; pg 11, ln 1-7; pg 12, ln 4-20; pg 13, ln 1-14; Abstract	1-8
X, P	WO 2016/076730 A1 (DWELLOP AS) 19 May 2016 (19.05.2016), entire document	1-8
A	US 9,062,500 B2 (ROBINSON et al.) 23 June 2015 (23.06.2015), entire document	1-8
A	US 7,451,821 B2 (RASHID et al.) 18 November 2008 (18.11.2008), entire document	1-8
A	US 7,083,004 B2 (ROODENBURG et al.) 01 August 2006 (01.08.2006), entire document	1-8
A	US 5,419,657 A (DAVIS) 30 May 1995 (30.05.1995), entire document	1-8

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Date of the actual completion of the international search

03 April 2017

Date of mailing of the international search report

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