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(54) Title: SYSTEMS AND METHODS FOR TETHERING SUBSEA WELLHEADS

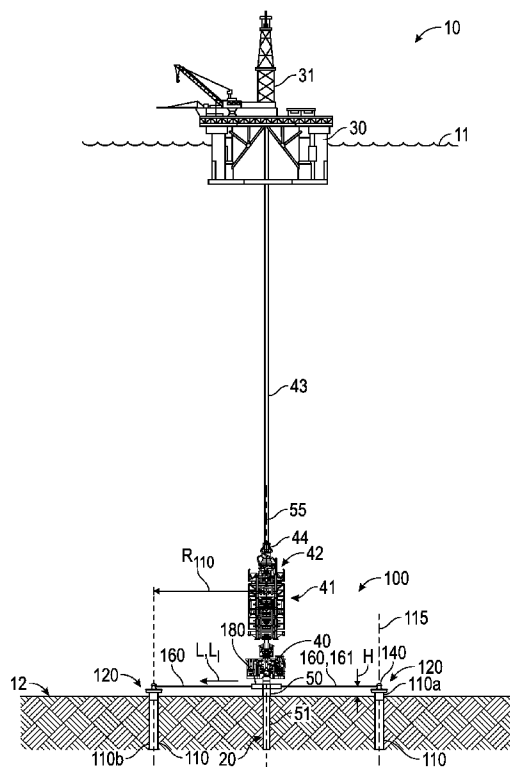


FIG. 1

(57) Abstract: A system for tethering a subsea wellhead 50 including a plurality of anchors 110 disposed about the subsea BOP 41 and secured to the sea floor 12. In addition, the system includes a plurality of tensioning systems 140. One tensioning system 140 is coupled to an upper end of each anchor 110. Further, a plurality of flexible tension members 160. Each tension member 160 extends from a first end coupled to the subsea wellhead 50 to a second end coupled to one of the tensioning systems 140. Each tensioning system 140 is configured to apply a tensile preload to one of the tension members 160.



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A. CLASSIFICATION OF SUBJECT MATTER
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B. FIELDS SEARCHED

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

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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	US 2006/042800 A1 (MILLHEIM KEITH K [US] ET AL) 2 March 2006 (2006-03-02)	22-26
A	paragraphs [0016], [0017], [0020] - [0022], [0032], [0033]; figure 1 -----	1-21,27
A	US 3 307 624 A (ARTHUR LUBINSKI) 7 March 1967 (1967-03-07) column 5, line 37 - line 71; figures 9,10 -----	1-27
A	US 4 818 146 A (FONTENOT OZEMAN J [US]) 4 April 1989 (1989-04-04) column 1, line 32 - line 51 column 3, line 3 - line 22 -----	1-27
A	US 3 017 934 A (RHODES AARON D ET AL) 23 January 1962 (1962-01-23) figures 1-8 -----	1-27



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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006042800	A1	02-03-2006	NONE

US 3307624	A	07-03-1967	DE 1245884 B 03-08-1967
			GB 1026655 A 20-04-1966
			NL 6405678 A 23-11-1964
			US 3307624 A 07-03-1967

US 4818146	A	04-04-1989	NONE

US 3017934	A	23-01-1962	NONE
