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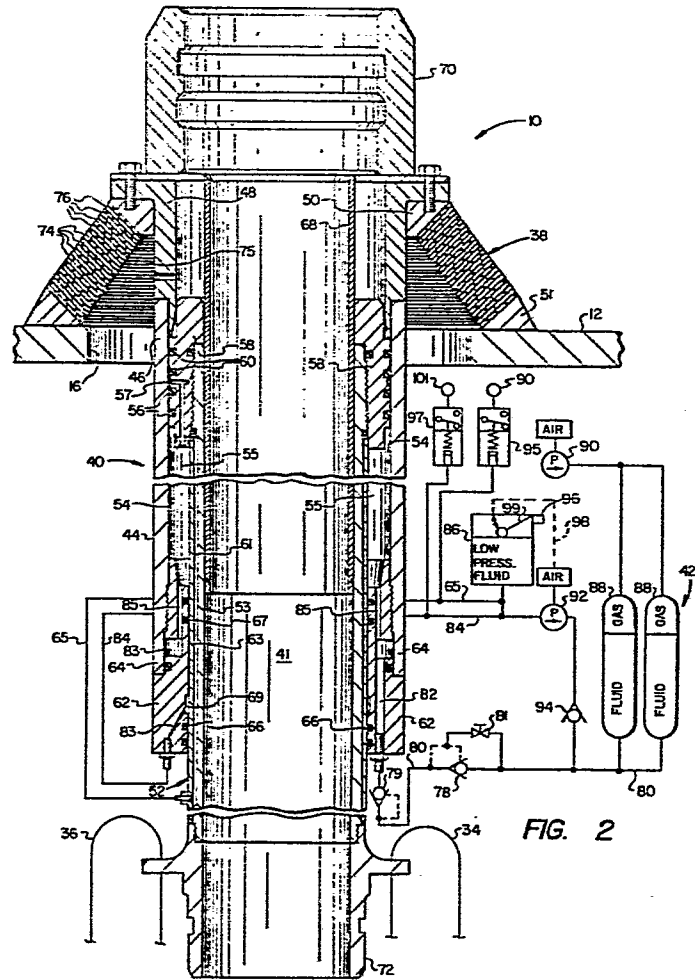
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(54) **Marine riser tensioner.**

(57) Motion compensating apparatus maintains a tension load on a marine riser supported from a floating platform which is subject to movement by wave action and the like. Bending movements induced by the roll and pitch of the vessel are decoupled by a resilient bearing member (38) having an annular section of a substantially spherical or conical laminated body of superposed layers of an elastic material (74) and a relatively inelastic material (76). A tension load is applied to the riser by a hydraulic actuator (40) which is supported by the resilient bearing member (38). The actuator includes a displacement compensating cylinder chamber (55) having an adjustable volume of hydraulic fluid presented to a piston (52) in the cylinder for supporting the upper end (72) of the marine riser. The displacement of fluid in the cylinder (55) varies in response to the heave of the vessel to maintain a positive lifting force on the marine riser. An accumulator assembly (88) is connected to the pressure chamber (55) of the hydraulic actuator for supplying hydraulic fluid to and for receiving hydraulic fluid from the pressure chamber in response to changes in its volume. Hydraulic fluid leakage past the actuator seals (56,60,67,68) is monitored through a fluid circuit (65,84) including pressure switches (95,97) and leakage flow indicators (103,101).





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EUROPEAN SEARCH REPORT

0088608

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EP 83 30 1178

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
Y	US-A-4 200 054 (ELLISTON) *Column 4, line 52 - column 7, line 11*	1-3, 9-17	E 21 B 19/00 E 21 B 7/12B F 16 F 1/40
P, Y	US-A-4 367 981 (SHAPIRO) *Column 5, line 4 - column 9, line 57*	1, 2, 4-6, 9-13, 16, 17	
A	EP-A-0 045 651 (CONOCO) *Page 7, line 1 - page 9, line 15*	1, 10, 12, 13	
A	US-A-3 739 844 (PETERMAN) *Column 5, line 39 - column 6, line 28*	4-6, 8	TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
A	US-A-4 004 532 (REYNOLDS) *The whole document*	4-6, 8	E 21 B F 16 F
A	US-A-3 643 751 (CRICKMER) *The whole document*	1, 2	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29-03-1984	Examiner PAUCNIK B.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			