

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: **81102711.9**

(51) Int. Cl.³: **E 21 B 34/16**
F 15 B 1/02

(22) Date of filing: **09.04.81**

(30) Priority: **11.04.80 US 139502**

(43) Date of publication of application:
21.10.81 Bulletin 81/42

(88) Date of deferred publication of search report: **04.11.81**

(84) Designated Contracting States:
DE FR GB IT

(71) Applicant: **FMC CORPORATION**
200 E. Randolph Drive
Chicago Illinois(US)

(72) Inventor: **Talafuse, Larry James**
P.O. Box 27790
Denver Colorado(US)

(74) Representative: **Bardehle, Heinz, Dipl.-Ing.**
Herrnstrasse 15 Postfach 260251
D-8000 München 26(DE)

(54) **Safety valve manifold system.**

(57) A hydraulic safety valve manifold system for providing positive opening and closing of a surface-controlled, sub-surface safety valve (24) in a subsea well, including a shut-off valve which prevents leakage of well fluids to the outside environment if a leak should occur in the safety valve or in hydraulic lines which are connected to the hydraulic actuator (25) of the safety valve. A hydraulic control line (27) is connected to the safety valve actuator through a normally closed shut-off valve (29), and this line is also connected to the actuator of the shut-off valve to hold both the shut-off valve (29) and the safety valve (24) open when the line is pressurized. The hydraulic line is also connected to an actuator (105) of a variable volume accumulator to empty the accumulator when the line is pressurized. When pressure in the hydraulic line is relieved the shut-off valve closes and the accumulator accepts fluid from the hydraulic actuator of the safety valve to insure that the safety valve closes.

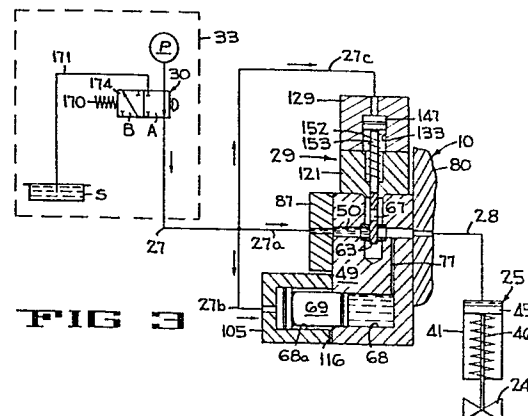


FIG 3



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
D	<u>US - A - 4 193 449 (LOCHTE)</u> * Column 4, line 13 to column 5, line 61 *	1-11	E 21 B 34/16 F 15 B 1/02
	--		
	<u>US - A - 2 998 070 (TAMPLEN)</u> * Column 2, line 11 to column 5, line 9 *	1,5	
	--		
	<u>US - A - 4 082 147 (WOLFF)</u> * Abstract - column 4, lines 18-36; column 4, line 62 to column 5, line 10; column 16, line 57 to column 17, line 22 *	1,5	TECHNICAL FIELDS SEARCHED (Int. Cl.) E 21 B F 16 K F 15 B
	--		
	<u>US - A - 3 763 891 (STILTNER)</u> * Claim 1 *	1,5	
	--		
	<u>US - A - 3 854 695 (BAUGH)</u> * Figures 2,3; column 3, line 10 to column 4, line 20 *	1,5	
	--		
	<u>US - A - 3 142 337 (POORMAN)</u> * Column 6, lines 16-52 *	1,5	CATEGORY OF CITED DOCUMENTS X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
	--		
E	<u>GB - A - 2 047 773 (LOCHTE)</u> * Whole document * & FR - A - 2 455 230 -----	1-11	& member of the same patent family, corresponding document
<input checked="" type="checkbox"/> The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
The Hague	04-08-1981	SOGNO	