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(54) Title: SYSTEM FOR DRILLING OIL AND GAS WELLS USING A CONCENTRIC DRILL STRING TO DELIVER A DUAL DENSITY MUD

(57) Abstract: A system for controlling drilling mud density at a location either at the seabed (or just above the seabed) or alternatively below the seabed of wells in offshore and land-based drilling applications is disclosed. The present invention combines a base fluid of lesser/greater density than the drilling fluid required at the drill bit to drill the well to produce a combination return mud in the riser. By combining the appropriate quantities of drilling mud with a light fluid, a riser mud density at or near the density of seawater may be achieved to facilitate transporting the return mud to the surface. Alternatively, by injecting the appropriate quantities of heavy fluid into a light return mud, the column of return mud may be sufficiently weighted to protect the wellhead. At the surface, the combination return mud is passed through a treatment system to cleanse the mud of drill cuttings and to separate the drilling fluid from the base fluid. The present invention further includes a control unit for manipulating drilling fluid systems and displaying drilling and drilling fluid data.



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/35977

A. CLASSIFICATION OF SUBJECT MATTER
 IPC(7) : E21B 7/128
 US CL : 175/7, 215, 320
 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)
 U.S. : 175/7, 215, 320, 5-7, 88, 205-207, 217; 166/350, 357, 358, 367, 368, 250.07

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,720,356 A (GARDES) 24 February 1998(24.02.1998), see entire document.	1, 6-7, 17 and 22-23
A	US 4,220,207 A (ALLEN) 02 September 1980(02.09.1980).	2-5, 8-16, 18-21 and 23-32
A	US 3,434,550 A (TOWNSEND, R.D. Jr.) 25 March 1969(25.03.1969).	2-5, 8-16, 18-21 and 23-32

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"O" document referring to an oral disclosure, use, exhibition or other means		
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Continuation of B. FIELDS SEARCHED Item 3:
East Search: US-PGPUB; USPAT; EPO; JPO; DERWENT, overbalance, underbalance, drill and (subsea offshore), fluid and density,
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