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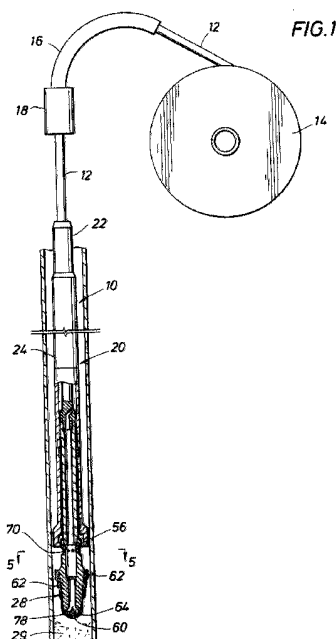
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(54) **Apparatus for cleaning well tubular members**

(57) A downhole cleaning tool (20) is suspended within a well tubular member (10) by coiled tubing (12) for the removal of deposits (29) within the tubular member (10). Tool (20) includes a hydraulic fluid motor (26) for rotating a combined fluid jetting and milling head (28). Fluid jetting and milling head (28) has a tapered body with a lower rounded nose (60). Embedded milling inserts or elements (62, 64) project outwardly from the tapered body and nose (60) to contact the deposit and are randomly spaced on head (28). A plurality of upper radial jets (70) extend above milling elements (62). Lower fluid jets or ports (78) extend from the lower rounded nose (60) of head (28). Power fluid from the coiled tubing (12) is divided at port (38) to the rotor bore (34) into a bypass fluid stream flowing through central bore (34) and a fluid power stream in annular passage (39) outside rotor (32) for rotation of rotor (32) and shaft (27) to rotate the fluid jetting and milling head (28).



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EUROPEAN SEARCH REPORT

Application Number
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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.6)
X,D	US 4 705 107 A (COUNCIL MALCOLM N ET AL) 10 November 1987 (1987-11-10) * column 4, line 10 - column 5, line 26; figures 4,5 *	1,3-6	E21B37/04 F28G3/10 F28G3/16
Y	---	2,3	
Y	US 3 133 603 A (JEAN-PIERRE LAPEYRE ET AL) 19 May 1964 (1964-05-19) * figure 1 *	2	
Y	---		
Y	US 4 909 325 A (HOPMANN MARK E) 20 March 1990 (1990-03-20) * figure 2 *	3	
A	---		
A	US 4 919 204 A (BAKER WALTER ET AL) 24 April 1990 (1990-04-24) * column 5, line 37 - column 6, line 29 *	1,6	
A	FR 2 707 335 A (EPIMKIN ALEXEI ALEXEEVICH) 13 January 1995 (1995-01-13) * the whole document *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E21B F28G B08B
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 6 December 2001	Examiner Giorgini, G
CATEGORY OF CITED DOCUMENTS		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	
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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06-12-2001

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4705107	A	10-11-1987	NONE	
US 3133603	A	19-05-1964	NONE	
US 4909325	A	20-03-1990	DE 4003969 A1 GB 2228029 A , B	16-08-1990 15-08-1990
US 4919204	A	24-04-1990	GB 2228026 A , B GB 2256887 A , B	15-08-1990 23-12-1992
FR 2707335	A	13-01-1995	RU 2047726 C1 RU 2010944 C1 FR 2707335 A1 CA 2104695 A1 DE 4294552 C2 DE 4294552 T0 GB 2276183 A , B JP 6505777 T WO 9313292 A1 SE 507276 C2 SE 9302748 A NO 933056 A US 6308780 B1	10-11-1995 15-04-1994 13-01-1995 29-06-1993 31-08-1995 13-01-1994 21-09-1994 30-06-1994 08-07-1993 04-05-1998 20-10-1993 18-10-1993 30-10-2001