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INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 98/02125

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 E21B43/11

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)
IPC 6 E21B E02D

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 practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 605 067 A (G.C. BURTON, JR.) 12 August 1986 see column 4; figure 4	1-4, 18, 20, 21
Y	---	5, 6, 8
X	US 4 479 556 A (G.W. STOUT ET AL.) 30 October 1984 see column 11; figures 1A, 1B	1-4
Y	---	5, 6
Y	EP 0 752 514 A (HALLIBURTON COMPANY) 8 January 1997 see column 3 - column 5; figure 1	8
Y	US 4 928 759 A (R.W. SIEGFRIED, II ET AL.) 29 May 1990 see column 3 - column 4; figure 2	

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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
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- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *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
- *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
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

12 October 1998

Date of mailing of the international search report

26. 01. 1999

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 98/02125

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3 984 988 A (J. -L. PORTIER) 12 October 1976 ---	18
A	EP 0 467 573 A (BAKER-HUGHES INCORPORATED) 22 January 1992 -----	1-8, 18-50

INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 98/ 02125

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. invention: claims 1-8,18-19,20-50;
2. invention: claims 9-11;
3. invention: claim 12;
4. invention: claim 13;
5. invention: claim 14;
6. invention: claims 15-17.

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-8, 18-19, 20-50

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP 98/02125

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4605067 A	12-08-1986	US 4600056 A	15-07-1986
US 4479556 A	30-10-1984	GB 2129102 A,B OA 7557 A US 4543700 A	10-05-1984 31-03-1985 01-10-1985
EP 752514 A	08-01-1997	US 5598894 A BR 9601917 A CA 2180515 A	04-02-1997 07-04-1998 06-01-1997
US 4928759 A	29-05-1990	CA 2026317 A GB 2236130 A,B NL 9020186 T NO 303947 B WO 9008878 A	02-08-1990 27-03-1991 01-02-1991 28-09-1998 09-08-1990
US 3984988 A	12-10-1976	FR 2290616 A CH 595513 A JP 1044009 C JP 51070917 A JP 55031851 B	04-06-1976 15-02-1978 30-04-1981 19-06-1976 21-08-1980
EP 467573 A	22-01-1992	CA 2046470 A US 5579283 A US 5343963 A US 5226494 A	10-01-1992 26-11-1996 06-09-1994 13-07-1993