

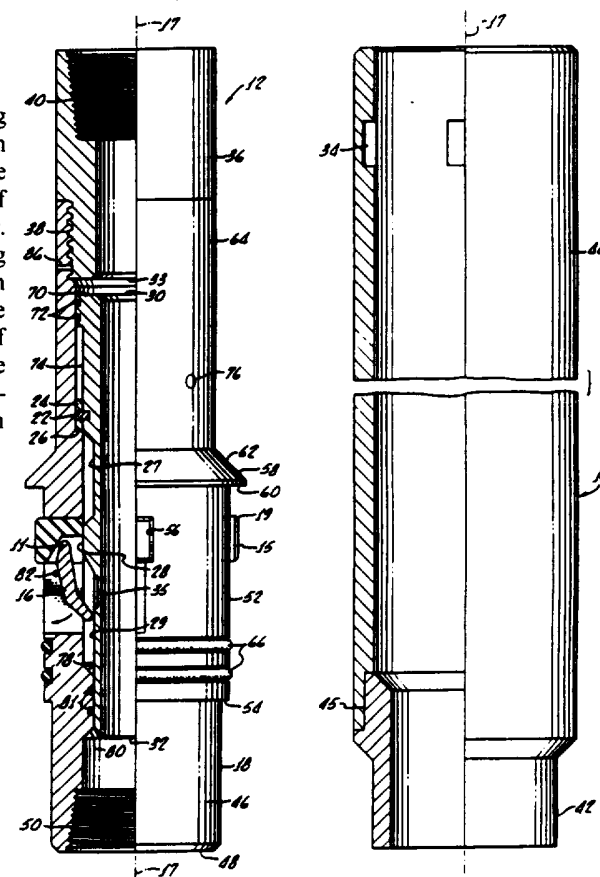


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁵ : E21B 17/06, 23/04, 43/10	A3	(11) International Publication Number: WO 92/17679 (43) International Publication Date: 15 October 1992 (15.10.92)
(21) International Application Number: PCT/US92/01440 (22) International Filing Date: 24 February 1992 (24.02.92) (30) Priority data: 676,266 26 March 1991 (26.03.91) US (71) Applicant: UNION OIL COMPANY OF CALIFORNIA [US/US]; 1201 W. 5th Street, Los Angeles, CA 90017 (US). (72) Inventors: MIMS, Michael, Gene ; 3100 Amber Court, Bakersfield, CA 93301 (US). MUELLER, Mark, David ; 14500 Las Palmas, #58, Bakersfield, CA 93306 (US).		(74) Agents: ABRAHAMS, Colin, P. et al.; Ladas & Parry, 3600 Wilshire Boulevard, #1520, Los Angeles, CA 90010 (US). (81) Designated States: AT, AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CA, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CI (OAPI patent), CM (OAPI patent), CS, DE, DE (European patent), DK, DK (European patent), ES, ES (European patent), FI, FR (European patent), GA (OAPI patent), GB, GB (European patent), GN (OAPI patent), GR (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC (European patent), MG, ML (OAPI patent), MN, MR (OAPI patent), MW, NL, NL (European patent), NO, PL, RO, RU, SD, SE, SE (European patent), SN (OAPI patent), TD (OAPI patent), TG (OAPI patent). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 18 March 1993 (18.03.93)

(54) Title: HYDRAULIC RELEASE OIL TOOL**(57) Abstract**

A hydraulic setting and release tool has a shear out setting assembly (12) attached to a string coupling member (14). Upon reaching a predetermined hydraulic pressure, a piston (20) of the tool shears restraining shear pins (22) and moves in a body (18) of the tool to release dogs (15) that engage the coupling member. When used in running in a liner, the coupling member is a running head that rotates the liner during running in and cementing. When used as a drill string release tool, the coupling member is a release sub, the tool being placed serially with other string components. If the drill string gets stuck, it is separated by merely increasing the hydraulic pressure sufficiently to shear the pins and allow the piston to move and the dogs to retract to separate the release sub from the shear out assembly.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	FI	Finland	MN	Mongolia
AU	Australia	FR	France	MR	Mauritania
BB	Barbados	GA	Gabon	MW	Malawi
BE	Belgium	GB	United Kingdom	NL	Netherlands
BF	Burkina Faso	GN	Guinea	NO	Norway
BG	Bulgaria	GR	Greece	NZ	New Zealand
BJ	Benin	HU	Hungary	PL	Poland
BR	Brazil	IE	Ireland	PT	Portugal
CA	Canada	IT	Italy	RO	Romania
CF	Central African Republic	JP	Japan	RU	Russian Federation
CG	Congo	KP	Democratic People's Republic of Korea	SD	Sudan
CH	Switzerland	KR	Republic of Korea	SE	Sweden
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovak Republic
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CS	Czechoslovakia	LU	Luxembourg	SU	Soviet Union
CZ	Czech Republic	MC	Monaco	TD	Chad
DE	Germany	MG	Madagascar	TG	Togo
DK	Denmark	MI	Mali	UA	Ukraine
ES	Spain			US	United States of America

International Application No PCT/US 92/01440

International Application No PCT/US 92/01440

According to International Patent Classification (IPC) or to both National Classification and IPC

According to International Patent Classification (IPC) or to both National Classification and IPC

Minimum Documentation Searched?

Int.Cl.5	E 21 B
----------	--------

**Documentation Searched other than Minimum Documentation
to the Extent that such Documents are Included in the Fields Searched⁸**

Category ^o	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
-----------------------	--	-------------------------------------

X	US,A,4984632 (SAMPA) 15 January 1991, see column 3, lines 15-37	9,10,21 -24
A	---	1
X	US,A,4909321 (PETREE) 20 March 1990, see column 9, lines 19-37	9,10,21 -24
A	---	1
A	US,A,4175778 (NUNEZ) 27 November 1979, see column 3, lines 2-32	1-3,7- 13,24
	---	-/-

"&" document member of the same patent family

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
29-07-1992	11-02-1993

International Searching Authority	Signature of Authorized Officer
EUROPEAN PATENT OFFICE	M.G. Sogno

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category °	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	US,A,4805696 (HENDERSON) 21 February 1989, see column 5, line 52 - column 6, line 14 ---	1,9,10, 21,24
A	US,A,4479539 (TAMPLEN) 30 October 1984, see column 7, lines 18-30 ---	1,9,10, 21,24
X,P	WO,A,9105935 (UNION OIL CY) 2 May 1991, see abstract (cited in the application)	1-3,6-9 ,21,22, 24
A	-----	10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 92/01440

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:

- claims 1-8 (partially), 9,10,12-20 (partially), 21-24
- claims 1-8 (partially)
- claims 11, 12-20 (partially)
- claims 25-28

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 (partially), 9,10,12-20 (partially)

Remark on Protest

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

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

US 9201440

SA 59835

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 26/01/93
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 4984632	15-01-91	None	
US-A- 4909321	20-03-90	CA-A- 2006200 EP-A- 0452397 WO-A- 9007628 US-A- 4997041	27-06-90 23-10-91 12-07-90 05-03-91
US-A- 4175778	27-11-79	None	
US-A- 4805696	21-02-89	GB-A, B 2214956	13-09-89
US-A- 4479539	30-10-84	CA-A- 1190144 GB-A, B 2128662 GB-A, B 2166473	09-07-85 02-05-84 08-05-86
WO-A- 9105935	02-05-91	US-A- 5086844 AU-A- 6527490 CA-A- 2067227 EP-A- 0495833	11-02-92 16-05-91 11-04-91 29-07-92