



- (51) International Patent Classification:
E21B 10/32 (2006.01) *E21B 10/46* (2006.01)
- (21) International Application Number:
PCT/US2012/039372
- (22) International Filing Date:
24 May 2012 (24.05.2012)
- (25) Filing Language:
English
- (26) Publication Language:
English
- (30) Priority Data:
13/116,875 26 May 2011 (26.05.2011) US
- (71) Applicant (for all designated States except US): **BAKER HUGHES INCORPORATED** [US/US]; P.o. Box 4740, Houston, TX 77210-4740 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **OXFORD, James, Andy** [US/US]; 40810 Roundup Road, Magnolia, TX 77354 (US).
- (74) Agents: **WELBORN, Brian, S.** et al.; Baker Hughes Incorporated, Intellectual Property Counsel, P.o. Box 4740, Houston, TX 77210-4740 (US).

AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(88) Date of publication of the international search report:
28 March 2013

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,



WO 2012/162517 A3

(54) Title: CORRODIBLE TRIGGERING ELEMENTS FOR USE WITH SUBTERRANEAN BOREHOLE TOOLS HAVING EXPANDABLE MEMBERS AND RELATED METHODS

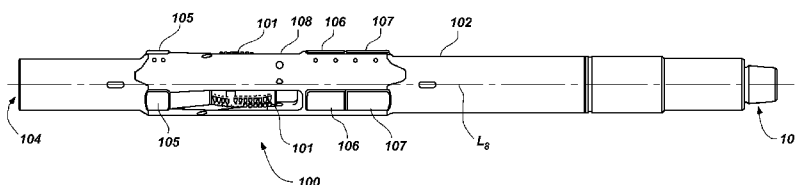


FIG. 1

(57) Abstract: Expandable apparatus include a triggering element comprising at least partially corrodible composite material. Methods are used to trigger expandable apparatus using such a triggering element and to form such triggering elements for use with expandable apparatus.

A. CLASSIFICATION OF SUBJECT MATTER**E21B 10/32(2006.01)i, E21B 10/46(2006.01)i**

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)

E21B 10/32; E21B 23/04; F16K 15/00; F16K 31/00; E21B 29/00

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: reamer, expanding, trigger, ball, corrodible and similar terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	US 2008-0128175 A1 (RADFORD, STEVEN R. et al.) 05 June 2008 See paragraphs 43, 55, 57, 67, 68 and figures 1,5, 18, 19	1-11,14-16 12,13,17-20
Y A	US 2007-0107908 A1 (VAIDYA, NITIN Y. et al.) 17 May 2007 See paragraphs 10, 28, 29, 34, 35, 70 and figure 1	1-11,14-16 12,13,17-20
Y A	WO 97-36088 A1 (SMITH INTERNATIONAL, INC.) 02 October 1997 See page 4 lines 7-21 and figures 1, 2	4 1-3,5-20
A	US 04945947 A (WESTRA, LUBBERT et al.) 07 August 1990 See column 3 lines 55-66 and figure 1	1-20

 Further documents are listed in the continuation of Box C. See patent family 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 application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"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

"&" document member of the same patent family

Date of the actual completion of the international search

07 DECEMBER 2012 (07.12.2012)

Date of mailing of the international search report

10 DECEMBER 2012 (10.12.2012)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan
City, 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

Bonghoon Lee

Telephone No. 82-42-481-8553



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/039372

Patent document cited in search report	Publication date	Patent family member(s)	Publication date		
US 2008-0128175 A1	05.06.2008	CA 2671343 A1	12.06.2008		
		CA 2671343 C	10.04.2012		
		CA 2671444 A1	12.06.2008		
		CA 2750159 A1	05.08.2010		
		CN 101589205 A	25.11.2009		
		CN 101657601 A	24.02.2010		
		CN 102341560 A	01.02.2012		
		EP 2094934 A2	02.09.2009		
		EP 2094935 A2	02.09.2009		
		EP 2322753 A2	18.05.2011		
		EP 2382367 A2	02.11.2011		
		US 2009-0145666 A1	11.06.2009		
		US 7900717 B2	08.03.2011		
		US 8028767 B2	04.10.2011		
		WO 2008-070051 A2	12.06.2008		
		WO 2008-070051 A3	12.06.2008		
		WO 2008-070052 A2	12.06.2008		
		WO 2008-070052 A3	12.06.2008		
		WO 2010-088231 A2	05.08.2010		
		WO 2010-088231 A3	05.08.2010		
US 2007-0107908 A1	17.05.2007	CA 2559111 A1	16.05.2007		
		GB 0618167 D0	25.10.2006		
		GB 2432377 A	23.05.2007		
		GB 2432377 B	18.06.2008		
		NO 20065254 A	18.05.2007		
		US 8231947 B2	31.07.2012		
WO 97-36088 A1	02.10.1997	AU 2167197 A	17.10.1997		
		CA 2220331 A1	02.10.1997		
		CA 2220331 C	18.10.2005		
		EP 0828922 A1	27.09.2000		
		EP 0828922 B1	27.06.2001		
		EP 0888491 A1	09.08.2000		
		GB 2311315 A	24.09.1997		
		GB 2311316 A	24.09.1997		
		NO 315866 B1	03.11.2003		
		NO 975263 A	17.11.1997		
		NO 975263 D0	17.11.1997		
		US 5941309 A	24.08.1999		
		WO 97-36089 A1	02.10.1997		
		US 04945947 A	07.08.1990	None	