## ${\bf (19)}\ World\ Intellectual\ Property\ Organization$

International Bureau





(43) International Publication Date 14 August 2008 (14.08.2008) (10) International Publication Number WO 2008/098052 A3

- (51) International Patent Classification: *E21B* 43/119 (2006.01)
- (21) International Application Number:

PCT/US2008/053181

- (22) International Filing Date: 6 February 2008 (06.02.2008)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:

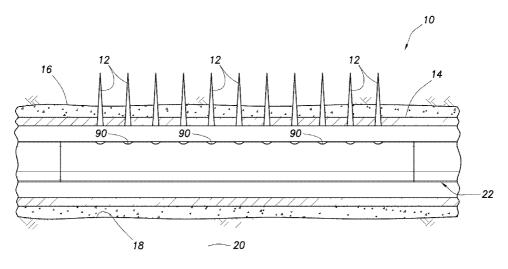
60/899,674 6 February 2007 (06.02.2007) US

- (71) Applicant (for all designated States except US): HAL¬LIBURTON ENERGY SERVICES, INC. [US/US]; 2601 Beltline Road, Carrollton, TX 75006 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): WALKER, Jerry,
  L. [US/US]; 3208 Wren Avenue, Fort Worth, TX 76133
  (US). HALES, John, H. [US/US]; 2499 Streamside Court,
  Frisco, TX 75034 (US). MOORE, Randall [US/US]; 2020
  Lansdown Drive, Carrollton, TX 75010 (US).
- (74) Agent: SMITH, Marlin, R.; Smith IP Services, PC, PO Box 997, Rockwall, TX 75087 (US).

- (81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT,BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

## **Published:**

- with international search report
- (88) Date of publication of the international search report: 16 October 2008
- (54) Title: WELL PERFORATING SYSTEM WITH ORIENTATION MARKER



FlG. 1

(57) Abstract: A well perforating system with an orientation marker. A well perforating system includes a perforating gun with a rotating perforating assembly and an orientation marker operative to indicate an azimuthal orientation of a perforating charge of the perforating assembly at a time of detonation of the perforating charge. The marker includes a portion biased by gravitational force to a vertically downward position as the assembly rotates. A method of indicating azimuthal orientation of a perforating charge at detonation includes: assembling the charge into a rotating perforating assembly of a perforating gun; attaching an orientation marker to the gun; permitting a portion of the marker to remain in a vertically downward position as a result of gravitational force acting on the portion, until the charge is detonated; and in response to detonation of the charge, fixing an orientation of the portion.



## INTERNATIONAL SEARCH REPORT

International application No PCT/US2008/053181

A CLASSIFICATION OF SUBJECT MATTER IPC(8) - E21B 43/1 19 (2008.04)			
USPC - 175/4.51 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(8) - E21 B 43/1 19 (2008 04) USPC - 175/4 51, 166/55, 55 1, 297			
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) PalBase			
C DOCUMENTS CONSIDERED TO BE RELEVANT			
Category*	Citation of document, with indication, where appropπate, of the relevant passages		Relevant to claim No
Y	US 7,044,236 B2 (IVERSEN et al) 16 May 2006 (16 05 2006) entire document		1-20
Y	US 2003/0098158 A1 (GEORGE et al) 29 May 2003 (20 05 2003) entire document		1-20
Α	US 4,552,234 A (REVETT) 12 November 1985 (12 11 1985) entire document		1-20
Α	US 6,843,320 B2 (YARBRO) 18 January 2005 (18 01 2005) entire document		1-20
Further documents are listed in the continuation of Box C			
"A" documento be or	categories of cited documents nt defining the general state of the art which is not considered particular relevance	"T" later document published after the interr date and not in conflict with the applica the principle or theory underlying the i	ation but cited to understand
"E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on pno $\pi$ ty claum(s) or which is		"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	
cited to establish the publication date of another citation or other special reason (as specified)  "O" document referring to an oral disclosure, use, exhibition or other means		"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	
Date of the actual completion of the international search  16 June 2008		Date of mailing of the international search report 07 JUL 2008	
Faccincile No. 571 272 2201		Authorized officer  Blame R Copenheaver  PCT Helpdβsk 571 272-4300  PCT OSP 571 272 7774	