



- (51) **International Patent Classification:**  
*E21D 21/00* (2006.01)    *E21B 10/32* (2006.01)
- (21) **International Application Number:**  
PCT/GB2014/051396
- (22) **International Filing Date:**  
7 May 2014 (07.05.2014)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**  
1308152.6                    7 May 2013 (07.05.2013)                    GB  
1400830.4                    17 January 2014 (17.01.2014)                    GB
- (71) **Applicant (for all designated States except US):** TECHNICAL SERVICES TEAM LTD [GB/GB]; The Barn, Cothey Butts, Ryde, Isle of Wight PO33 4HD (GB).
- (72) **Inventors; and**
- (73) **Applicants (for US only):** VASEY, Alan [GB/GB]; c/o Technical Services Team Ltd, The Barn, Cothey Butts, Ryde, Isle of Wight PO33 4HD (GB). MURRAY, Ian

[GB/GB]; c/o Technical Services Team Ltd, The Barn, Cothey Butts, Ryde, Isle of Wight PO33 4HD (GB).

(74) **Agent:** LEACH, Sean; Mathys & Squire LLP, The Shard, 32 London Bridge Street, London SE1 9SG (GB).

(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, BN, 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, IR, IS, JP, KE, KG, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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,

[Continued on next page]

(54) **Title:** SELF-BORING SHIELD ANCHOR APPARATUS AND METHOD

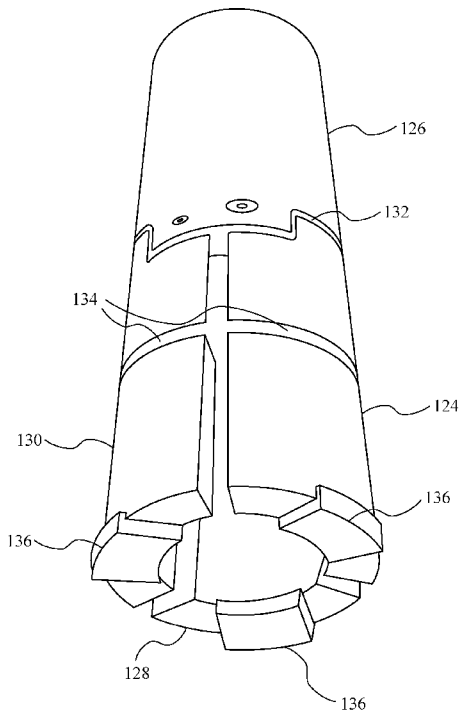


Fig. 7

(57) **Abstract:** A drill bit for cutting a hole comprising an undercut into a substrate is provided. The drill bit comprises a shaft (10) having a first cutting tip (12), a mandrel (14) on the shaft (10), and a flareable sleeve (16) comprising a second cutting tip (20, 22) drivable separately from the first cutting tip (12). The mandrel (14) and the sleeve (16) are arranged so that urging the sleeve (16) distally over the mandrel (14) flares part of the sleeve (16) outward from the shaft for reaming out the undercut outwardly from the hole.

WO 2014/181105 A3



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, KM, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments (Rule 48.2(h))*

**Published:**

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

**(88) Date of publication of the international search report:**  
16 April 2015

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/GB2014/051396

**A. CLASSIFICATION OF SUBJECT MATTER**  
INV. E21D21/00 E21B10/32  
ADD.

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)  
E21D

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)

EPO-Internal, WPI Data

**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 2009/133933 A1 (KARPELLUS WALTER [AT] ET AL) 28 May 2009 (2009-05-28) paragraphs [0031] - [0033]; figures 1-7 -----	1-8, 22-40 9-21
Y	WO 2008/122086 A1 (GRAY PETER ANDREW [AU]) 16 October 2008 (2008-10-16) page 26, line 27 - page 27, line 13; figures 1-12 -----	1-8, 22-44
Y	WO 2012/015349 A1 (SANDVIK INTELLECTUAL PROPERTY [SE]; HORSCH JOHN [AU]) 2 February 2012 (2012-02-02) page 8, line 14 - page 10, line 8; figures 1-4 -----	1-8, 41-44
Y	& WO 2004/106700 A1 (DUNEFIRE PTY LTD [AU]; SEEDSMAN ROSS [AU]) 9 December 2004 (2004-12-09) paragraphs [0029] - [0031]; figures 1-7 ----- -/--	1-8, 41-44

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	"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
"E" earlier application or patent but published on or after the international filing date	"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
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search  11 February 2015	Date of mailing of the international search report  20/02/2015
---	--

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Manolache, Iustin
--	---

## INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2014/051396

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 419 805 A (CALANDRA JR FRANK [US]) 13 December 1983 (1983-12-13) column 6, line 52 - column 7, line 51 -----	41

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2014/051396

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009133933	A1	28-05-2009	AT 417186 T 15-12-2008
			AT 501979 A1 15-12-2006
			AU 2006251842 A1 30-11-2006
			CA 2607920 A1 30-11-2006
			CN 101184906 A 21-05-2008
			EP 1885997 A1 13-02-2008
			ES 2316067 T3 01-04-2009
			JP 2008542579 A 27-11-2008
			KR 20080038276 A 06-05-2008
			US 2009133933 A1 28-05-2009
			WO 2006125242 A1 30-11-2006
			ZA 200709749 A 26-11-2008
-----			
WO 2008122086	A1	16-10-2008	AU 2008235258 A1 16-10-2008
			WO 2008122086 A1 16-10-2008
-----			
WO 2012015349	A1	02-02-2012	AU 2010206071 A1 16-02-2012
			CN 103038448 A 10-04-2013
			US 2013129425 A1 23-05-2013
			WO 2012015349 A1 02-02-2012
-----			
US 4419805	A	13-12-1983	US 4419805 A 13-12-1983
			ZA 8107999 A 24-11-1982
-----			