



(51) International Patent Classification:

C22C 26/00 (2006.01) *E21B 10/567* (2006.01)
E21B 10/00 (2006.01)

(21) International Application Number:

PCT/EP2014/056463

(22) International Filing Date:

31 March 2014 (31.03.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

1305871.4 31 March 2013 (31.03.2013) GB

(71) Applicant: **ELEMENT SIX ABRASIVES S.A.** [LU/LU];
48 rue de Bragance, L-1255 Luxembourg (LU).(72) Inventors: **KANYANTA, Valentine**; Element Six Global
Innovation Centre, Fermi Avenue, Harwell Campus, Did-
cot, Oxfordshire OX11 0QR (GB). **KASONDE, Maweja**;
Element Six Global Innovation Centre, Fermi Avenue,
Harwell Campus, Didcot, Oxfordshire OX11 0QR (GB).
BALOYI, Rodwell; c/o Element Six (Production) (Pty)
Ltd, 1 Debid Road, Nuffield, 1559 Springs (ZA).(74) Agents: **REEVE, Anna** et al.; Element Six Limited, Group
Intellectual Property, Fermi Avenue, Harwell Campus,
Didcot Oxfordshire OX11 0QR (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,
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).

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a
patent (Rule 4.17(ii))*

Published:

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

(88) Date of publication of the international search report:

24 December 2014

(54) Title: SUPERHARD CONSTRUCTIONS & METHODS OF MAKING SAME

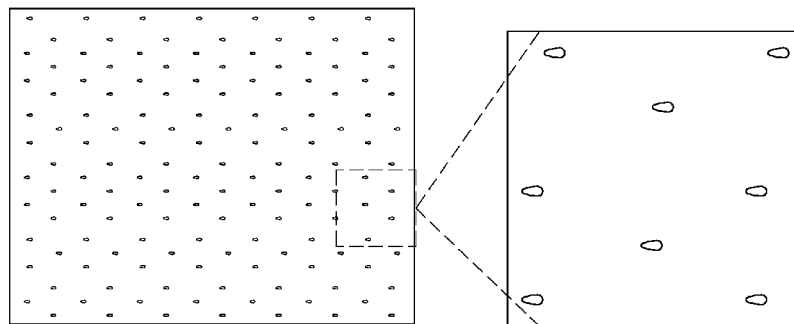


Fig. 2a

(57) **Abstract:** A superhard polycrystalline construction comprises a body of polycrystalline superhard material comprising a superhard phase, and a non-superhard phase dispersed in the superhard phase, the superhard phase comprising a plurality of inter-bonded superhard grains. The non-superhard phase comprises particles or grains that do not chemically react with the superhard grains and form less than around 10 volume % of the body of polycrystalline superhard material. There is also disclosed a method of forming such a superhard polycrystalline construction.

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2014/056463

A. CLASSIFICATION OF SUBJECT MATTER

INV. C22C26/00 E21B10/00 E21B10/567
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)

C22C B22F E21B

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.
X	US 2010/132266 A1 (TWERSKY ANTON RAOUL [ZA] ET AL) 3 June 2010 (2010-06-03) paragraphs [0071], [0007], [0072], [0114], [0115] -----	1,3-7, 10-12, 15,16, 29-33, 37-39
X	WO 2011/141898 A1 (ELEMENT SIX PRODUCTION PTY LTD [ZA]; NAIDOO KAVESHINI [ZA]; SITHEBE HU) 17 November 2011 (2011-11-17) page 2 page 6 page 10 - page 11 ----- -/-	1-5,7-9, 11-38



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 another 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

24 October 2014

Date of mailing of the international search report

03/11/2014

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

Forestier, Gilles

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2014/056463

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2007/148214 A2 (ELEMENT SIX PRODUCTION PTY LTD [ZA]; CAN ANTIONETTE [ZA]; DAVIES GEOFF) 27 December 2007 (2007-12-27) the whole document	1-39
A	US 2012/037429 A1 (DAVIES GEOFFREY JOHN [ZA] ET AL) 16 February 2012 (2012-02-16) the whole document	1-39

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2014/056463

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 2010132266	A1	03-06-2010	CN	101627139 A	13-01-2010
			CN	103451460 A	18-12-2013
			EP	2099945 A2	16-09-2009
			EP	2426229 A1	07-03-2012
			JP	5355415 B2	27-11-2013
			JP	5462922 B2	02-04-2014
			JP	2010512300 A	22-04-2010
			JP	2013032285 A	14-02-2013
			KR	20090091803 A	28-08-2009
			KR	20140079855 A	27-06-2014
			US	2010132266 A1	03-06-2010
			US	2013174494 A1	11-07-2013
			WO	2008072180 A2	19-06-2008

WO 2011141898	A1	17-11-2011	CA	2799305 A1	17-11-2011
			CN	103038380 A	10-04-2013
			EP	2569457 A1	20-03-2013
			GB	2480384 A	16-11-2011
			WO	2011141898 A1	17-11-2011

WO 2007148214	A2	27-12-2007	NONE		

US 2012037429	A1	16-02-2012	AU	2010213465 A1	08-09-2011
			CA	2751846 A1	19-08-2010
			CN	102356169 A	15-02-2012
			EP	2396437 A2	21-12-2011
			JP	2012517531 A	02-08-2012
			KR	20110137773 A	23-12-2011
			RU	2011137184 A	20-03-2013
			US	2012037429 A1	16-02-2012
			WO	2010092540 A2	19-08-2010
