

Title (en)  
HARDMETAL MATERIALS FOR HIGH-TEMPERATURE APPLICATIONS

Title (de)  
HARTMETALLMATERIALIEN FÜR HOCHTEMPERATURANWENDUNGEN

Title (fr)  
MATERIAUX A BASE DE METAUX DURS POUR APPLICATIONS A HAUTE TEMPERATURE

Publication  
**EP 1922427 A4 20090318 (EN)**

Application  
**EP 06813610 A 20060821**

Priority  
• US 2006032654 W 20060821  
• US 71001605 P 20050819

Abstract (en)  
[origin: WO2007022514A2] Hardmetal compositions each including hard particles having a first material and a binder matrix having a second, different material comprising rhenium or a Ni-based superalloy. Tungsten may also be used as a binder matrix material. A two-step sintering process may be used to fabricate such hardmetals at relatively low sintering temperatures in the solid-state phase to produce substantially fully-densified hardmetals. A hardmetal coating or structure may be formed on a surface by using a thermal spray method.

IPC 8 full level  
**C22C 29/02** (2006.01); **C22C 1/05** (2006.01); **C22C 29/08** (2006.01); **C22C 29/14** (2006.01); **C22C 29/16** (2006.01)

CPC (source: EP KR)  
**C22C 29/005** (2013.01 - EP); **C22C 29/04** (2013.01 - KR); **C22C 29/14** (2013.01 - KR); **C22C 29/16** (2013.01 - KR); **B22F 2998/00** (2013.01 - EP); **B22F 2998/10** (2013.01 - EP)

Citation (search report)  
• [X] WO 2004065645 A1 20040805 - GENIUS METAL INC [US], et al  
• [XP] US 2005191482 A1 20050901 - LIU SHAIW-RONG S [US]  
• [X] WO 9317141 A1 19930902 - DOW CHEMICAL CO [US]  
• [X] US 3409416 A 19681105 - YATES PAUL C  
• [X] FR 2350403 A1 19771202 - EUROTUNGSTENE [FR]  
• [X] US 4432794 A 19840221 - HOLLECK HELMUT [DE]  
• [X] US 6514456 B1 20030204 - LACKNER ANDREAS [AT], et al  
• [Y] HULYAL R ET AL: "SINTERING OF WC-10 CO HARD METALS CONTAINING VANADIUM CARBONITRIDE AND RHENIUM - PART I: VANADIUM CARBONITRIDE ADDITION", INTERNATIONAL JOURNAL OF REFRACTORY METALS AND HARD MATERIALS, ELSEVIER PUBLISHERS, BARKING, GB, vol. 10, no. 1, 1 January 1991 (1991-01-01), pages 1 - 07, XP001062038, ISSN: 0263-4368  
• [Y] HULYAL R ET AL: "SINTERING OF WC-10 CO HARD METALS CONTAINING VANADIUM CARBONITRIDE AND RHENIUM-PART II: RHENIUM ADDITION", INTERNATIONAL JOURNAL OF REFRACTORY METALS AND HARD MATERIALS, ELSEVIER PUBLISHERS, BARKING, GB, vol. 10, no. 1, 1 January 1991 (1991-01-01), pages 9 - 13, XP001079033, ISSN: 0263-4368  
• [A] ETTMAYER P: "Hardmetals and cermets", ANNUAL REVIEW OF MATERIAL SCIENCE. VOL.19 ANNUAL REVIEWS PALO ALTO, CA, USA, vol. 19, August 1989 (1989-08-01), pages 145 - 164, XP002512236, ISBN: 0-8243-1719-x, Retrieved from the Internet <URL:http://arjournals.annualreviews.org/doi/pdf/10.1146/annurev.ms.19.080189.001045> [retrieved on 1990]  
• [A] CARLEN J-C ET AL: "Rhenium-a unique rare metal", MATERIALS AND MANUFACTURING PROCESSES, MARCEL DEKKER, NEW YORK, NY, US, vol. 9, no. 6, 1 January 1994 (1994-01-01), pages 1087 - 1104, XP008099505, ISSN: 1042-6914  
• See references of WO 2007022514A2

Designated contracting state (EPC)  
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

DOCDB simple family (publication)  
**WO 2007022514 A2 20070222; WO 2007022514 A3 20080807**; AU 2006280936 A1 20070222; BR PI0615027 A2 20110426; CA 2617945 A1 20070222; CN 101316941 A 20081203; EP 1922427 A2 20080521; EP 1922427 A4 20090318; IL 189288 A0 20080605; JP 2009504926 A 20090205; KR 20080053468 A 20080613

DOCDB simple family (application)  
**US 2006032654 W 20060821**; AU 2006280936 A 20060821; BR PI0615027 A 20060821; CA 2617945 A 20060821; CN 200680038569 A 20060821; EP 06813610 A 20060821; IL 18928808 A 20080205; JP 2008527214 A 20060821; KR 20087006457 A 20080317