

Title (en)
BODY COATED WITH HARD MATERIAL

Title (de)
HARTSTOFFBESCHICHTETER KÖRPER

Title (fr)
CORPS REVETU D'UNE MATIERE DURE

Publication
EP 3031948 B1 20170315 (DE)

Application
EP 15185878 A 20090120

Priority
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• EP 09718954 A 20090120

Abstract (en)
[origin: CA2717187A1] The invention relates to a body coated with hard material, comprising several layers that are applied by means of CVD. An Al₂O₃-layer is arranged as an outer layer on a Ti_{1-x}Al_xN-layer and/or Ti_{1-x}Al_xC-layer and/or Ti_{1-x}Al_xCN-layer.

IPC 8 full level
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CPC (source: EP US)
C23C 30/005 (2013.01 - EP US); **Y10T 428/24975** (2015.01 - EP US)

Citation (opposition)
Opponent : Mitsubishi Materials Corporation
• JP 2001341008 A 20011211 - HITACHI TOOL ENG
• JP H09125249 A 19970513 - HITACHI TOOL
• WO 2007003648 A1 20070111 - FRAUNHOFER GES FORSCHUNG [DE], et al
• DE 19630791 A1 19980205 - KENNAMETAL HERTEL AG [DE]
• EP 1470879 A1 20041027 - MITSUBISHI MAT KOBE TOOLS CORP [JP], et al
• US 2011003216 A1 20110106 - YOSHIZAWA ATSUSHI [JP]
• JP 2002263911 A 20020917 - MITSUBISHI MATERIALS CORP
• ANONYM: "EMAX-7000 brochure", HORIBA, pages 1 - 12
• ANONYM: "Energiedispersive Röntgenspektroskopie", WIKIPEDIA, 28 February 2017 (2017-02-28), XP055441612, Retrieved from the Internet <URL:https://de.wikipedia.org/wiki/Energiedispersive_R%C3%B6ntgenspektroskopie>
• ANONYMOUS: "X-Ray Emission Lines", 16 May 2017 (2017-05-16), pages 1 - 2, XP055441618, Retrieved from the Internet <URL:http://www.med.harvard.edu/jpnm/physics/refs7xrayemis.html>
• "Improvement of energy resolution of EDS analysis of transmission", JOURNAL OF ELECTRON MICROSCOPY , FEMMS09 (THE TWELFTH FRONTIERS OF ELECTRON MICROSCOPY IN MATERIALS SCIENCE, 25 September 2009 (2009-09-25), Retrieved from the Internet <URL:http://www.femms2009.org>
• ANONYMOUS: "Kennametal Master Catalogue", 2001, pages 1 - 4, XP055441622
• M. KATHREIN ET AL.: "Wear Protection in Cutting Tool Applications by PACVD (Ti,Al)N and Al₂O₃ coatings", 15TH INTERNATIONAL PLANSEE SEMINAR, vol. 2, 2001, pages 726 - 738, XP055441626
• ANONYM: "Jahresbericht 2005", IKTS FRAUNHOFER INSTITUT KERAMISCHE TECHNOLOGIEN UND SYSTEME, 2005, pages 2 - 84, XP055441647
• I. ENDLER: "Al-rich ti_{1-x}Al_xN - A new CVD layer", FRAUNHOFER ADVANCER 3/2012, FRAUNHOFER ADVANCER ALLIANCE, DRESDEN, 1 March 2012 (2012-03-01), pages 1 - 4, XP055324865
• I. ENDLER ET AL.: "Aluminium-rich Ti_{1-x}Al_xN Coatings by CVD", EURO PM 2006-HARD MATERIALS, THIN AND THICK COATINGS, PROCEEDINGS, vol. 1, 1 October 2006 (2006-10-01), Ghent, Belgium, pages 219 - 224, XP008105516
• I. ENDLER ET AL.: "Novel aluminium-rich Ti_{1-x}Al_xN coatings by LPCVD", SURFACE & COATINGS TECHNOLOGY 203 82008, vol. 203, no. 5-7, 25 December 2008 (2008-12-25), pages 530 - 533, XP002524222
• ANONYM: "Fräsen", WIKIPEDIA, 24 October 2017 (2017-10-24), XP055441650, Retrieved from the Internet <URL:https://de.wikipedia.org/wiki/Fr5C3A4sen>
• A. ESCUDEIRO SANTANA ET AL.: "The role of hcp-AlN on hardness behavior of Ti_{1-x}Al_xN nanocomposite during annealing", THIN SOLID FILMS, vol. 469-470, 22 December 2004 (2004-12-22), pages 339 - 344, XP004663333

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DOCDB simple family (publication)
DE 102008013965 A1 20090917; BR PI0908924 A2 20150818; BR PI0908924 B1 20240123; CA 2717187 A1 20090917; CA 2717187 C 20151117; CN 101970717 A 20110209; CN 103834928 A 20140604; CN 103834928 B 20161102; EP 2252721 A1 20101124; EP 2252721 B1 20151104; EP 3031948 A1 20160615; EP 3031948 B1 20170315; ES 2561597 T3 20160229; ES 2628524 T3 20170803; JP 2011516722 A 20110526; JP 5863241 B2 20160216; KR 20100122918 A 20101123; MX 2010009890 A 20100930; PL 2252721 T3 20160229; PL 3031948 T3 20170731; RU 2010141746 A 20120420; RU 2491368 C2 20130827; US 2010323176 A1 20101223; US 8389134 B2 20130305; WO 2009112115 A1 20090917

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