

Title (en)

METHOD FOR MANUFACTURING AN OILED ZNALMG COATED SHEET AND CORRESPONDING SHEET

Title (de)

VERFAHREN ZUM HERSTELLEN EINES GEÖLTEN ZNALMG-BESCHICHTETEN BLECHS UND ENTSPRECHENDES BLECH

Title (fr)

PROCÉDÉ DE RÉALISATION D'UNE TÔLE À REVÊTEMENTS ZNALMG HUILÉS ET TÔLE CORRESPONDANTE

Publication

EP 2841615 B1 20200624 (FR)

Application

EP 13727384 A 20130425

Priority

- FR 2012050906 W 20120425
- IB 2013053286 W 20130425

Abstract (en)

[origin: WO2013160566A1] The method comprises at least the following steps: providing a steel substrate (3) having two faces (5), depositing a metal coating (7) on each face (5) by quenching the substrate (3) in a hot bath, cooling the metal coatings (7), altering the magnesium hydroxide or magnesium oxide layers formed on the outer surfaces (15) of the metal coatings (7), and depositing a layer of oil on the outer surfaces (15) of the metal coatings (7).

IPC 8 full level

C23C 2/06 (2006.01); **C23C 2/26** (2006.01); **C23C 22/06** (2006.01)

CPC (source: CN EP KR US)

C23C 2/06 (2013.01 - CN EP KR US); **C23C 2/26** (2013.01 - CN EP US); **C23C 2/29** (2022.08 - KR); **C23C 2/40** (2013.01 - KR); **C23C 22/06** (2013.01 - CN KR US); **C23C 22/53** (2013.01 - KR US); **C23C 22/82** (2013.01 - KR US); **C23C 28/321** (2013.01 - US); **C23C 28/345** (2013.01 - KR US); **C23G 1/12** (2013.01 - EP KR); **Y10T 428/12549** (2015.01 - EP US)

Citation (examination)

- US 2010055344 A1 20100304 - OSTWALD CARMEN [DE], et al
- JP 2007131906 A 20070531 - NIPPON STEEL CORP

Citation (opposition)

Opponent : SALZGITTER FLACHSTAHL GMBH

- EP 1857567 A1 20071121 - THYSSENKRUPP STEEL AG [DE]
- US 2003175547 A1 20030918 - CAREY JAY F [US], et al
- JP 2007131906 A 20070531 - NIPPON STEEL CORP
- UWE B.: "Surface defects on hot-dip metal coated steel sheet", 1998, pages 97, XP055800678, ISBN: 3-514-00620-2
- P. GREIS: "Die neue Feuerverzinkungsanlage der Thyssen Stahl AG in Duisburg", STAHL UND EISEN, vol. 113, no. 8, 16 August 1993 (1993-08-16), pages 77 - 80, XP055800675
- W. ZIMNIK ET AL.: "Modernisierung der Horizontal-Feuerverzinkungsanlage bei der Preussag Stahl AG", STAHL UND EISEN, vol. 118, no. 6, 16 June 1998 (1998-06-16), pages 55 - 61, XP000769954
- G. RIHA ET AL.: "Galvatech", vol. 6, 2004, INTERNATIONAL CONFERENCE ON ZINC AND ZINC ALLOY COATED STEEL SHEET, ISBN: 1-886362-71-8, article "The New Galvanizing Line No. 3 at voestalpine Stahl GmbH", pages: 173 - 184, XP055800618
- NAGATA ET AL.: "Nisshin-Steel's Toyo works starts up a state-of-the-art galvanizing line", INTERNATIONAL CONFERENCE ON ZINC AND ZINC ALLOY COATED STEEL SHEET, vol. 6, 2004, pages 185 - 196, XP055800616, ISBN: 1-886362-71-8
- W. WARNECKE ET AL.: "Leistungsspektrum moderner Zink-Magnesium- Schmelztauchüberzüge", STAHL UND EISEN, vol. 129, no. 6, 2009, pages 53 - 59, XP001547855
- SCHWENZFEIER W., A. HERZOG, J. HOHENWATER: "6 Richten", 1979, SPRINGER VERLAG, ISBN: 3-211-81545-7, article "Walzwerktechnik. Ein Leitf. für Studium u. Praxis", pages: 214 - 230, XP055800613

Opponent : ThyssenKrupp Steel Europe AG

- WO 2007132008 A1 20071122 - THYSSENKRUPP STEEL AG [DE], et al
- WO 2011032890 A1 20110324 - BWG BERGWERK WALZWERK [DE], et al
- DE 19740953 A1 19990318 - HENKEL KGAA [DE]
- EP 1350865 A2 20031008 - THYSSENKRUPP STAHL AG [DE]
- WO 2011052269 A1 20110505 - NIPPON STEEL CORP [JP], et al
- C.K. RIENER ET AL.: "Nano-characterisation of the surface of HDG Zn-Al-Mg-coated steel sheets", PROCEEDINGS / 8TH INTERNATIONAL CONFERENCE ON ZINC AND ZINC ALLOY COATED STEEL SHEET, GALVATECH 2011, 21 June 2011 (2011-06-21), Genova (Italy), pages 1 - 10, XP055650409
- ANONYMOUS: "Schmelztauchveredeltes Band und Blech", CHARAKTERISTISCHE MERKMALE 095, 2010, Düsseldorf, pages 1 - 30, XP055643288, ISSN: 0175-2006

Opponent : voestalpine Stahl GmbH

- EP 2474649 A1 20120711 - VOESTALPINE STAHL GMBH [AT]
- US 2010055344 A1 20100304 - OSTWALD CARMEN [DE], et al
- EP 2537954 A1 20121226 - NIPPON STEEL & SUMIKIN COATED [JP], et al
- JP H09241828 A 19970916 - NISSHIN STEEL CO LTD
- JP 2007131906 A 20070531 - NIPPON STEEL CORP
- EP 1524326 A1 20050420 - NISSHIN STEEL CO LTD [JP]
- "Charakteristische Merkmale 095 - Schmelztauchveredeltes Band und Blech", STAHL-INFORMATIONEN-ZENTRUM, 2010, Düsseldorf, XP055650430
- "8th International Conference on Zinc and Zinc Alloy Coated Steel Sheet GALVATECH 2011", AIMNET.IT, 2011, XP055797508, ISBN: 978-88-85298-82-8

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)

WO 2013160566 A1 20131031; BR 112014026681 A2 20170627; BR 112014026681 B1 20201020; CA 2871672 A1 20131031; CA 2871672 C 20170117; CN 104334764 A 20150204; CN 104334764 B 20170714; CN 107012419 A 20170804; CN 107012419 B 20191224; EP 2841615 A1 20150304; EP 2841615 B1 20200624; ES 2808663 T3 20210301; HU E051979 T2 20210428; IN 9954DEN2014 A 20150814;

JP 2015521233 A 20150727; JP 2017128810 A 20170727; JP 6143845 B2 20170607; JP 6487474 B2 20190320; KR 101656166 B1 20160908; KR 20150012256 A 20150203; MA 20150099 A1 20150331; MA 37452 B1 20160429; MX 2014013007 A 20150807; PL 2841615 T3 20201116; RU 2583193 C1 20160510; UA 114627 C2 20170710; US 10294558 B2 20190521; US 10865483 B2 20201215; US 2015125714 A1 20150507; US 2019169754 A1 20190606; WO 2013160871 A1 20131031

DOCDB simple family (application)

FR 2012050906 W 20120425; BR 112014026681 A 20130425; CA 2871672 A 20130425; CN 201380028915 A 20130425; CN 201710085219 A 20130425; EP 13727384 A 20130425; ES 13727384 T 20130425; HU E13727384 A 20130425; IB 2013053286 W 20130425; IN 9954DEN2014 A 20141124; JP 2015507655 A 20130425; JP 2017027551 A 20170217; KR 20147032765 A 20130425; MA 37452 A 20141023; MX 2014013007 A 20120425; PL 13727384 T 20130425; RU 2014147319 A 20130425; UA A201412653 A 20130425; US 201314397108 A 20130425; US 201816207888 A 20181203