

Title (en)
RAIL AND METHOD FOR MANUFACTURING SAME

Title (de)
SCHIENE UND VERFAHREN ZUR HERSTELLUNG DAVON

Title (fr)
RAIL ET PROCÉDÉ POUR LE FABRIQUER

Publication
EP 3124636 B1 20190306 (EN)

Application
EP 15768893 A 20150324

Priority
• JP 2014060786 A 20140324
• JP 2015001659 W 20150324

Abstract (en)
[origin: EP3124636A1] Provided is a rail that exhibits excellent wear resistance and reduced hardness variation in a rail length direction. The rail has a chemical composition containing 0.60% to 1.0% of C, 0.1% to 1.5% of Si, 0.01% to 1.5% of Mn, 0.035% or less of P, 0.030% or less of S, and 0.1% to 2.0% of Cr, the balance being Fe and incidental impurities. Surface hardness of the rail exhibits variation of \pm HB 15 points or less in the rail length direction.

IPC 8 full level
C21D 6/00 (2006.01); **C21D 8/00** (2006.01); **C21D 9/04** (2006.01); **C22C 38/00** (2006.01); **C22C 38/02** (2006.01); **C22C 38/04** (2006.01); **C22C 38/06** (2006.01); **C22C 38/18** (2006.01); **C22C 38/22** (2006.01); **C22C 38/24** (2006.01); **C22C 38/26** (2006.01); **C22C 38/28** (2006.01); **C22C 38/34** (2006.01); **C22C 38/38** (2006.01); **C22C 38/42** (2006.01); **C22C 38/46** (2006.01); **C22C 38/48** (2006.01); **C22C 38/50** (2006.01)

CPC (source: EP US)
C21D 6/002 (2013.01 - EP US); **C21D 6/005** (2013.01 - EP US); **C21D 6/008** (2013.01 - EP US); **C21D 8/005** (2013.01 - EP US); **C21D 9/04** (2013.01 - EP US); **C22C 38/00** (2013.01 - EP US); **C22C 38/001** (2013.01 - EP US); **C22C 38/002** (2013.01 - EP US); **C22C 38/02** (2013.01 - EP US); **C22C 38/04** (2013.01 - EP US); **C22C 38/06** (2013.01 - EP US); **C22C 38/18** (2013.01 - EP US); **C22C 38/22** (2013.01 - EP US); **C22C 38/24** (2013.01 - EP US); **C22C 38/26** (2013.01 - EP US); **C22C 38/28** (2013.01 - EP US); **C22C 38/34** (2013.01 - EP US); **C22C 38/38** (2013.01 - EP US); **C22C 38/42** (2013.01 - EP US); **C22C 38/46** (2013.01 - EP US); **C22C 38/48** (2013.01 - EP US); **C22C 38/50** (2013.01 - EP US)

Citation (opposition)
Opponent : voestalpine Schienen GmbH
• US 2003192625 A1 20031016 - CORDOVA J VINCENT [US]
• US 4886558 A 19891212 - TERAMOTO TOYOKAZU [JP], et al
• JP H07216454 A 19950815 - NIPPON STEEL CORP
• CN 1754973 A 20060405 - CHINA ACADEMY OF RAILWAY SCIEN [CN]
• US 2010116381 A1 20100513 - HONJO MINORU [JP], et al
• JP 2773867 B2 19980709
• EP 0685566 A1 19951206 - NIPPON STEEL CORP [JP]
• JP S6289818 A 19870424 - NIPPON KOKAN KK
• JP 2001234238 A 20010828 - NIPPON STEEL CORP
• JP 2010077481 A 20100408 - JFE STEEL CORP
• JP 2014060786 A 20140403 - KYOCERA CORP
• EP 3124636 A1 20170201 - JFE STEEL CORP [JP]

Cited by
SE543919C2; CN111405949A; EP3778966A4; AU2019242158B2; US11530471B2; WO2022106864A1; EP3124636B1

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)
EP 3124636 A1 20170201; EP 3124636 A4 20170201; EP 3124636 B1 20190306; EP 3124636 B2 20230517; AU 2015237464 A1 20160811; AU 2015237464 B2 20180201; BR 112016022007 B1 20210511; CA 2936780 A1 20151001; CA 2936780 C 20181002; CN 106103772 A 20161109; CN 106103772 B 20180522; JP 6150008 B2 20170621; JP WO2015146150 A1 20170413; US 2017101692 A1 20170413; WO 2015146150 A1 20151001

DOCDB simple family (application)
EP 15768893 A 20150324; AU 2015237464 A 20150324; BR 112016022007 A 20150324; CA 2936780 A 20150324; CN 201580013144 A 20150324; JP 2015001659 W 20150324; JP 2016510035 A 20150324; US 201515128267 A 20150324