

Title (en)

HIGH-STRENGTH STEEL SHEET EXCELLENT IN WORKABILITY AND MANUFACTURING METHOD THEREOF

Title (de)

HOCHFESTES STAHLBLECH MIT HERVORRAGENDER BEARBEITBARKEIT UND HERSTELLUNGSVERFAHREN DAFÜR

Title (fr)

TÔLE D'ACIER À HAUTE RÉSISTANCE PRÉSENTANT UNE EXCELLENTE APTITUDE AU FAÇONNAGE, ET SON PROCÉDÉ DE FABRICATION

Publication

EP 2695961 B1 20190619 (EN)

Application

EP 12765664 A 20120321

Priority

- JP 2011080953 A 20110331
- JP 2011080954 A 20110331
- JP 2011197670 A 20110909
- JP 2011197671 A 20110909
- JP 2012057210 W 20120321

Abstract (en)

[origin: EP2695961A1] Provided are: a high-strength steel sheet which is improved in both elongation and local formability and thus exhibits excellent workability; and a manufacturing method thereof. The high-strength steel sheet contains C, Si, Mn, Al, P and S with the remainder including iron and unavoidable impurities, and has a metal structure which includes polygonal ferrite, bainite, tempered martensite, and retained austenite. In the metal structure, (1) the bainite has a composite microstructure including both a high-temperature-formed bainite having an average distance between adjacent regions of retained austenite and/or carbide of 1 μm or more and a low-temperature-formed bainite having an average distance between adjacent regions of retained austenite and/or carbide of less than 1 μm each identified upon observation with a scanning electron microscope; and (2) the retained austenite is present in a volume percentage of 5% or more of the entire metal structure as determined by a saturation magnetization measurement.

IPC 8 full level

C22C 38/00 (2006.01); **C21D 9/46** (2006.01); **C22C 38/60** (2006.01); **C23C 2/02** (2006.01); **C23C 2/06** (2006.01); **C23C 2/28** (2006.01); **C23C 2/40** (2006.01)

CPC (source: EP KR US)

C21D 6/004 (2013.01 - EP US); **C21D 6/005** (2013.01 - EP US); **C21D 6/008** (2013.01 - EP US); **C21D 8/0205** (2013.01 - EP US); **C21D 8/0247** (2013.01 - EP US); **C21D 8/0447** (2013.01 - KR); **C21D 9/46** (2013.01 - EP US); **C22C 38/001** (2013.01 - EP KR US); **C22C 38/002** (2013.01 - EP KR US); **C22C 38/005** (2013.01 - EP KR US); **C22C 38/02** (2013.01 - EP KR US); **C22C 38/04** (2013.01 - EP KR US); **C22C 38/06** (2013.01 - EP KR US); **C22C 38/08** (2013.01 - EP US); **C22C 38/12** (2013.01 - EP US); **C22C 38/14** (2013.01 - EP US); **C22C 38/16** (2013.01 - EP KR US); **C22C 38/22** (2013.01 - EP US); **C22C 38/28** (2013.01 - EP US); **C22C 38/34** (2013.01 - EP KR US); **C22C 38/38** (2013.01 - EP KR US); **C22C 38/42** (2013.01 - EP KR US); **C22C 38/50** (2013.01 - EP KR US); **C22C 38/58** (2013.01 - EP KR US); **C23C 2/0224** (2022.08 - EP KR US); **C23C 2/024** (2022.08 - KR); **C23C 2/06** (2013.01 - KR US); **C23C 2/28** (2013.01 - EP US); **C23C 2/40** (2013.01 - US); **C21D 2211/001** (2013.01 - EP KR US); **C21D 2211/002** (2013.01 - EP KR US); **C21D 2211/005** (2013.01 - EP KR US); **C21D 2211/008** (2013.01 - EP KR US); **Y10T 428/12799** (2015.01 - EP US)

Cited by

EP3050988A4; EP3263733A4; US10066274B2; US10941476B2; US10876181B2

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 2695961 A1 20140212; **EP 2695961 A4 20141217**; **EP 2695961 B1 20190619**; CN 103459638 A 20131218; CN 103459638 B 20150715; CN 104762565 A 20150708; CN 104762565 B 20170412; EP 2942416 A1 20151111; EP 2942416 B1 20170607; KR 101574400 B1 20151203; KR 101604963 B1 20160318; KR 20130125829 A 20131119; KR 20150050592 A 20150508; US 2014044988 A1 20140213; US 2016355920 A1 20161208; WO 2012133057 A1 20121004

DOCDB simple family (application)

EP 12765664 A 20120321; CN 201280015849 A 20120321; CN 201510126711 A 20120321; EP 15172192 A 20120321; JP 2012057210 W 20120321; KR 20137025521 A 20120321; KR 20157009749 A 20120321; US 201214008875 A 20120321; US 201615239858 A 20160818