

Title (en)

Process of manufacturing iron-carbon-manganese alloy strips and strips obtained thereby

Title (de)

Verfahren zum Herstellen von Eisen-Kohlenstoff-Mangan-Legierungsbändern und also hergestellte Bänder

Title (fr)

"Procédé de fabrication de bandes en alliage fer-carbone-manganèse, et bandes ainsi produites"

Publication

EP 1067203 B1 20040303 (FR)

Application

EP 00401860 A 20000629

Priority

FR 9908758 A 19990707

Abstract (en)

[origin: EP1067203A1] 1.5-10 mm-thick strip is cast from molten metal containing (in wt. %) C 0.001-1.6; Mn 6-30, Ni \leq 10 and (Mn+Ni) 16-30; Si \leq 2.5; Al \leq 6; Cr \leq 10; (P+Sn+Sb+As) \leq 0.2; (S+Se+Te) \leq 0.5; (V+Ti+Nb+B+Zr+rare earths) \leq 0.3%; (Mo+W) \leq 0.5%; N \leq 0.3%; Cu \leq 5%; and Fe and production impurities. After cold rolling to 10-90% reduction in one or more stages, recrystallization annealing is carried out. Preferably, the content of carbon in the molten metal is 0.2-0.8 wt.%. The strip is obtained by rolling between two closely located, horizontal cylinders which rotate in opposite directions and are internally cooled. Between the casting and rolling stages the strip is hot rolled to 10-60 % reduction in one or more stages, and between the casting and hot rolling stages the strip is passed through a non-oxidizing zone. Before the hot rolling stage the strip is subjected to decarbonization. The strip is coiled after casting or hot rolling and uncoiled before cold rolling. Acidic pickling of the strip is preferably carried out before cold rolling. Recrystallization annealing comprises a high density annealing process carried out at 900-1100 degrees C, immediately followed by cooling at a rate of 100-6000 degrees C/second. The strip is pickled after the annealing stage, followed by a skin-pass stage. An Independent claim is given for the an iron-carbon-manganese strip produced by the above process.

IPC 1-7

C21D 8/02; **C22C 38/04**

IPC 8 full level

B22D 11/00 (2006.01); **B22D 11/06** (2006.01); **B22D 11/12** (2006.01); **C21D 8/02** (2006.01); **C21D 9/46** (2006.01); **C22C 38/00** (2006.01); **C22C 38/04** (2006.01); **C22C 38/60** (2006.01)

CPC (source: EP US)

C21D 8/0205 (2013.01 - EP US); **C22C 38/04** (2013.01 - EP US); **C21D 8/0215** (2013.01 - EP US); **C21D 8/0236** (2013.01 - EP US); **C21D 8/0273** (2013.01 - EP US)

Cited by

FR2857980A1; FR2878257A1; CN101956134A; FR2881144A1; EP1971701A4; CN113512686A; FR2876708A1; GB2385862A; KR101004268B1; EP3202941A4; US7806165B2; EP2208803A1; US10450624B2; WO2101109A1; US7794552B2; US9677146B2; US7799148B2; US7976650B2; WO2006048034A1; WO2006056670A3; WO2005061152A1; WO2005019483A1; WO2006042931A1; WO2006077301A1; WO2007074994A1; US9580786B2; WO2018036918A1; WO2012052626A1; WO2012052689A1; US8926772B2; US9873931B2; US11131011B2; EP2402472B2; EP1399598B2

Designated contracting state (EPC)

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

DOCDB simple family (publication)

EP 1067203 A1 20010110; **EP 1067203 B1 20040303**; AT E260992 T1 20040315; BR 0002544 A 20010313; CA 2314624 A1 20010107; CA 2314624 C 20090407; DE 60008641 D1 20040408; DE 60008641 T2 20050203; ES 2215008 T3 20041001; FR 2796083 A1 20010112; FR 2796083 B1 20010831; JP 2001049348 A 20010220; JP 2011068997 A 20110407; JP 4713709 B2 20110629; US 6358338 B1 20020319

DOCDB simple family (application)

EP 00401860 A 20000629; AT 00401860 T 20000629; BR 0002544 A 20000706; CA 2314624 A 20000706; DE 60008641 T 20000629; ES 00401860 T 20000629; FR 9908758 A 19990707; JP 2000206004 A 20000707; JP 2010281215 A 20101217; US 61241500 A 20000707