

Title (en)
HIGH-STRENGTH ELECTROMAGNETIC STEEL SHEET AND PROCESS FOR PRODUCING THE SAME

Title (de)
HOCHFESTE ELEKTROMAGNETISCHE STAHLPLATTE UND HERSTELLUNGSVERFAHREN DAFÜR

Title (fr)
TÔLE EN ACIER ÉLECTROMAGNÉTIQUE À GRANDE RÉSISTANCE ET SON PROCÉDÉ DE FABRICATION

Publication
EP 2031079 A1 20090304 (EN)

Application
EP 06767202 A 20060616

Priority
JP 2006312552 W 20060616

Abstract (en)
The present invention has as its object the production of high strength electrical steel sheet, having a high strength of a tensile strength TS of for example 500 MPa or more, having wear resistance, and having superior magnetic properties of magnetic flux density and iron loss, that is, provides a method of production of high strength electrical steel sheet containing, by mass%, C: 0.060% or less, Si: 0.2 to 6.5%, Mn: 0.05 to 3.0%, P: 0.30% or less, S or Se: 0.040% or less, Al: 2.50% or less, N: 0.020% or less, and further one or more of Cu: 0.001 to 30.0% and Nb: 0.03 to 8.0% and having worked structures remaining inside the steel sheet, said method of production of high strength electrical steel sheet coarsening an average crystal grain size D (μm) of a sheet right before a step of forming the worked structures to finally remain inside the steel sheet to $D \geq 20 \mu\text{m}$, imparting strain in the final working step as a preferred process, then not performing any heat treatment causing the worked structures to disappear and high strength electrical steel sheet obtained by that method.

IPC 8 full level
C21D 8/12 (2006.01); **C21D 9/46** (2006.01); **C22C 38/00** (2006.01); **C22C 38/60** (2006.01); **H01F 1/147** (2006.01); **H01F 1/16** (2006.01)

CPC (source: EP KR US)
C21D 8/02 (2013.01 - EP KR US); **C21D 8/12** (2013.01 - EP KR US); **C21D 8/1216** (2013.01 - EP US); **C21D 8/1233** (2013.01 - EP US); **C21D 8/1244** (2013.01 - EP US); **C21D 8/1266** (2013.01 - EP US); **C22C 38/00** (2013.01 - EP KR US); **C22C 38/004** (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 KR US); **C22C 38/16** (2013.01 - EP KR US); **C22C 38/18** (2013.01 - EP KR US); **C22C 38/42** (2013.01 - EP KR US); **H01F 1/16** (2013.01 - EP US); **H01F 1/14775** (2013.01 - EP US)

Cited by
EP2474636A4; EP3118336A4; DE102015112215A1; DE102011053722B3; DE102011053722C5; EP2818564A4; EP2832882A4; US9570219B2; WO2013038020A1; US9761359B2; US9085817B2; US9595376B2; WO2013038008A1; US9627116B2

Designated contracting state (EPC)
DE FR GB SE

Designated extension state (EPC)
AL BA HR MK RS

DOCDB simple family (publication)
EP 2031079 A1 20090304; **EP 2031079 A4 20160706**; **EP 2031079 B1 20210113**; CN 101466851 A 20090624; CN 101466851 B 20120822; JP WO2007144964 A1 20091029; KR 101177161 B1 20120824; KR 20090014383 A 20090210; US 2010158744 A1 20100624; WO 2007144964 A1 20071221

DOCDB simple family (application)
EP 06767202 A 20060616; CN 200680054999 A 20060616; JP 2006312552 W 20060616; JP 2008521083 A 20060616; KR 20087030461 A 20060616; US 30834608 A 20081212