

Title (en)

Silicon steel plate and method for producing the same

Title (de)

Silizium-Stahlblech und Verfahren zur Herstellung dieses Bleches

Title (fr)

Plaque d'acier au silicium et procédé pour sa fabrication

Publication

EP 1052043 A3 20020410 (EN)

Application

EP 00109188 A 20000509

Priority

- JP 12925099 A 19990510
- JP 37235199 A 19991228
- JP 2000035402 A 20000214
- JP 2000035435 A 20000214

Abstract (en)

[origin: EP1052043A2] A silicon steel plate excellent in magnetic properties, workability, flatness, punching quality and the like is produced easily even in a case of high Si content as much as 12 wt%, through ÄAÜ powder mixing process using iron powder and Fe-Si alloy powder, ÄBÜ powder rolling process for forming the mixture into sheet metal, ÄCÜ sintering process, ÄDÜ cold rolling process, ÄEÜ diffusion annealing process, and ÄFÜ finish rolling process for subjecting the sintered, cold-rolled and annealed sheet metal to skin pass rolling. <IMAGE>

IPC 1-7

B22F 3/18; B22F 3/24; B22F 7/08; C22C 1/04; C22C 38/02; C22C 33/02

IPC 8 full level

B22F 3/18 (2006.01); C22C 38/02 (2006.01); H01F 1/147 (2006.01); C21D 8/12 (2006.01)

CPC (source: EP)

B22F 3/18 (2013.01); C22C 38/02 (2013.01); H01F 1/14783 (2013.01); B22F 2003/248 (2013.01); C21D 8/1227 (2013.01); C21D 8/1233 (2013.01); C21D 8/1238 (2013.01)

Citation (search report)

- [X] US 4618377 A 19861021 - NAKAMURA MOTOHARU [JP], et al
- [X] FUJII H ET AL: "GLASS FILM STRUCTURE OF GRAIN-ORIENTED SILICON STEEL USING ALUMINUM NITRIDE AS AN INHIBITOR", JOURNAL OF MATERIALS ENGINEERING AND PERFORMANCE, ASM INTERNATIONAL, MATERIALS PARK, US, vol. 3, no. 2, 1 April 1994 (1994-04-01), pages 214 - 217, XP000470001, ISSN: 1059-9495
- [XY] INOKUTI Y ET AL: "GRAIN ORIENTED SILICON STEEL SHEET WITH NEW CERAMIC FILMS CHARACTERIZED BY ULTRA-LOW IRON LOSS", MATERIALS TRANSACTIONS JIM, SENDAI, JP, vol. 33, no. 10, 1 September 1992 (1992-09-01), pages 946 - 952, XP000770023
- [Y] WANG W-F: "ROLLING COMPACTION, MAGNETIC PROPERTIES, AND MICROSTRUCTURAL DEVELOPMENT DURING SINTERING OF FE-SI", POWDER METALLURGY, METALS SOCIETY. LONDON, GB, vol. 38, no. 4, 1995, pages 289 - 293, XP000544812, ISSN: 0032-5899
- [XD] PATENT ABSTRACTS OF JAPAN vol. 017, no. 678 (C - 1141) 13 December 1993 (1993-12-13)

Cited by

KR100946070B1; CN107626927A; CN103014613A; CN103817331A; US2013298730A1; US9773597B2; US7435304B2; KR101103449B1

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 1052043 A2 20001115; EP 1052043 A3 20020410

DOCDB simple family (application)

EP 00109188 A 20000509