

Title (en)  
Shaped rolled product and method of making the same

Title (de)  
Profiliertes Walzgut und Verfahren zu dessen Herstellung

Title (fr)  
Laminé profilé et procédé pour sa fabrication

Publication  
**EP 0849368 B1 20040428 (DE)**

Application  
**EP 97890249 A 19971216**

Priority  
AT 222296 A 19961219

Abstract (en)  
[origin: EP0849368A1] A rolled profile, especially a road or railway rail, consists of an iron alloy which contains C, Si, Mn, optionally Cr, special carbide forming and transformation modifying elements and/or micro-alloying additions, balance Fe and impurities and which has a structure formed by accelerated cooling from the austenitic region. The novelty is that the iron alloy has a Si content of NOTGREATER 0.93 (preferably 0.21-0.69) wt.%, an Al content of NOTGREATER 0.06 (preferably less than 0.03) wt.%, a total Si + Al content of less than 0.99 wt.% and, over at least parts of its cross-section along its length, a structure formed by isothermal transformation of austenite in the lower intermediate phase or lower bainitic region. Preferably, the iron alloy contains (by wt.) 0.41-1.3 (preferably 0.51-0.98) % C, 0.31-2.55 (preferably 0.91-1.95) % Mn and balance Fe, preferably with addition of 0.21-2.45 (preferably 0.38-1.95) % Cr and optionally up to 0.88 (preferably up to 0.49) % Mo, up to 1.69 (preferably up to 0.95) % W, up to 0.39 (preferably up to 0.19) % V, up to 0.28 (preferably up to 0.19) % total of Nb, Ta, Zr, Hf and/or Ti, up to 2.4 (preferably up to 0.95) % Ni and up to 0.006 (preferably up to 0.004) % B. Also claimed is production of the above rolled profile, in which (a) the alloy composition is chosen within narrow limits which determine the transformation behaviour on cooling from the f.c.c. structure or austenitic region; and (b) the rolled profile, produced from the alloy, is cooled to between the martensite point and a temperature NOTGREATER 250 (preferably NOTGREATER 190, especially 5-110) degrees C above the martensite point and then allowed to transform isothermally.

IPC 1-7  
**C21D 9/04**

IPC 8 full level  
**B21B 1/085** (2006.01); **E01B 5/02** (2006.01); **B21B 3/00** (2006.01); **B23P 9/04** (2006.01); **C21D 1/02** (2006.01); **C21D 1/20** (2006.01); **C21D 8/00** (2006.01); **C21D 9/04** (2006.01); **C22C 38/00** (2006.01); **C22C 38/06** (2006.01); **C22C 38/38** (2006.01); **C22C 38/54** (2006.01)

CPC (source: EP US)  
**C21D 1/20** (2013.01 - EP US); **C21D 9/04** (2013.01 - EP US); **C21D 2211/002** (2013.01 - EP US)

Cited by  
DE102006059050A1; US6884306B1; WO9909222A1; WO0111096A1; WO2016028174A1

Designated contracting state (EPC)  
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

DOCDB simple family (publication)  
**EP 0849368 A1 19980624**; **EP 0849368 B1 20040428**; AT 407057 B 20001227; AT A222296 A 20000415; AT E265549 T1 20040515; AU 4848597 A 19980625; AU 728635 B2 20010111; BR 9706423 A 19990810; CA 2225240 A1 19980619; CA 2225240 C 20100316; CN 1101856 C 20030219; CN 1185359 A 19980624; CZ 295574 B6 20050817; CZ 411197 A3 19990512; DE 59711569 D1 20040603; DK 0849368 T3 20040830; ES 2216123 T3 20041016; HU 220124 B 20011128; HU 9702498 D0 19980302; HU P9702498 A2 19980728; HU P9702498 A3 20000328; JP 4039474 B2 20080130; JP H10195604 A 19980728; PL 184601 B1 20021129; PL 323703 A1 19980622; PT 849368 E 20040930; RO 119237 B1 20040630; RU 2136767 C1 19990910; SI 0849368 T1 20040831; UA 41454 C2 20010917; US 6086685 A 20000711

DOCDB simple family (application)  
**EP 97890249 A 19971216**; AT 222296 A 19961219; AT 97890249 T 19971216; AU 4848597 A 19971218; BR 9706423 A 19971219; CA 2225240 A 19971218; CN 97108732 A 19971218; CZ 411197 A 19971218; DE 59711569 T 19971216; DK 97890249 T 19971216; ES 97890249 T 19971216; HU P9702498 A 19971218; JP 36969897 A 19971210; PL 32370397 A 19971212; PT 97890249 T 19971216; RO 9702312 A 19971209; RU 97121919 A 19971218; SI 9730643 T 19971216; UA 97126153 A 19971218; US 99419097 A 19971219