

Title (en)

Thermal treatment process for manufacturing surface hardened unalloyed or low alloyed, elongated or flat steel products

Title (de)

Wärmebehandlungsverfahren zur Herstellung randschichtgehärteter Lang- und Flachprodukte aus unlegierten oder niedriglegierten Stählen

Title (fr)

Procédé de traitement thermique pour la fabrication de produits durcis superficiellement, allongés ou plats, en acier non-allié ou faiblement allié

Publication

EP 1050591 A3 20040623 (DE)

Application

EP 00108714 A 20000422

Priority

DE 19921286 A 19990507

Abstract (en)

[origin: EP1050591A2] In the heat treatment process for the production of edge layer hardened strip and sheet non-alloy and low-alloy steel, the initial cooling process is in a number of steps. Each process step applies a cooling to a temperature below the martensite start temperature to give a martensite change only over a part of the edge zone. A following timed phase relaxes the section which has already had a martensite structure and/or the combined edge zone to give a martensite/austenite composition.

IPC 1-7

C21D 1/19; **C21D 1/06**; **C21D 8/08**; **C21D 1/78**

IPC 8 full level

C21D 1/02 (2006.01); **C21D 1/06** (2006.01); **C21D 1/19** (2006.01); **C21D 6/00** (2006.01); **C21D 8/08** (2006.01); **C21D 9/00** (2006.01)

CPC (source: EP US)

C21D 1/02 (2013.01 - EP US); **C21D 1/19** (2013.01 - EP US); **C21D 8/08** (2013.01 - EP US); **C21D 2221/10** (2013.01 - EP US); **Y10S 148/902** (2013.01 - EP US)

Citation (search report)

- [X] DE 2916218 A1 19801023 - FLORIN STAHL WALZWERK
- [A] US 4016009 A 19770405 - ECONOMOPOULOS MARIO, et al
- [A] GB 1351423 A 19740501 - KONINKLIJKE HOOGOVS EN STAAL [NL]
- [A] GB 2087927 A 19820603 - ARBED
- [A] US 4877463 A 19891031 - AICHER MAX [DE], et al

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 1050591 A2 20001108; **EP 1050591 A3 20040623**; DE 19921286 A1 20001109; JP 2000328141 A 20001128; US 6355119 B1 20020312

DOCDB simple family (application)

EP 00108714 A 20000422; DE 19921286 A 19990507; JP 2000133603 A 20000502; US 56620600 A 20000505