

## Title (en)

METHOD OF PRODUCING HIGH-STRENGTH COLD-ROLLED STEEL SHEET SUITABLE FOR WORKING

## Publication

**EP 0462380 A3 19931006 (EN)**

## Application

**EP 91106841 A 19910426**

## Priority

JP 15985690 A 19900620

## Abstract (en)

[origin: EP0462380A2] A method of producing a high-strength cold-rolled steel sheet suitable for working uses which utilizes a steel material having the following composition: not more than 0.02 wt% of C, not more than 1.0 wt% of Si, not more than 2.0 wt% of Mn, and not less than 0.01 wt% but not more than 0.10 wt% of Ti, the Ti, C and N contents being determined to meet the condition of  $Ti > (48/12) C \text{ wt\%} + (48/14) N \text{ wt\%}$ , the steel also consisting essentially of not less than 0.0010 wt% but not more than 0.0100 wt% of Nb, not less than 0.0002 wt% but not more than 0.0020 wt% of B, not less than 0.03 wt% but not more than 0.20 wt% of P, not more than 0.03 wt% of S, not less than 0.010 wt% but not more than 0.100 wt% of Al, not more than 0.008 wt% of N, not more than 0.0045 wt% of O, and the balance substantially Fe and incidental inclusions. The steel material is cast and hot-rolled and then subjected to a cold rolling conducted at a sheet temperature not higher than 300 DEG C under such a condition that the sum of the rolling reductions of passes which meet the following condition between said sheet temperature (T DEG C) and the strain rate  $\epsilon / \dot{\epsilon}$  ( $S \rightarrow 1$ ) is 50 % or greater:  $T \times \epsilon / \dot{\epsilon} \geq 50,000 \text{ DEG C}$   $S \rightarrow 1$  The steel sheet is then continuously annealed or galvanized.

<IMAGE>

## IPC 1-7

**C21D 8/04**

## IPC 8 full level

**C21D 9/48** (2006.01); **C21D 8/02** (2006.01); **C21D 8/04** (2006.01); **C21D 9/46** (2006.01); **C22C 38/00** (2006.01); **C22C 38/14** (2006.01)

## CPC (source: EP KR)

**C21D 8/04** (2013.01 - KR); **C21D 8/0431** (2013.01 - EP); **C22C 38/00** (2013.01 - KR); **C21D 8/0436** (2013.01 - EP)

## Citation (search report)

- [AD] EP 0295697 A2 19881221 - KAWASAKI STEEL CO [JP]
- [A] EP 0194118 A2 19860910 - KAWASAKI STEEL CO [JP]
- [A] GB 2111419 A 19830706 - NIPPON STEEL CORP
- [AD] PATENT ABSTRACTS OF JAPAN vol. 7, no. 91 (C-162)(1236) 15 April 1983 & JP-A-58 019 442 ( NIPPON KOKAN ) 4 February 1983
- [AD] PATENT ABSTRACTS OF JAPAN vol. 9, no. 52 (C-269)(1775) 6 March 1985 & JP-A-59 193 221 ( SHIN NIPPON SEITETSU ) 1 November 1984
- [A] PATENT ABSTRACTS OF JAPAN vol. 12, no. 316 (C-524)26 August 1988 & JP-A-63 086 819 ( KAWASAKI STEEL ) 18 April 1988

## Cited by

EP0780482A1; FR2742769A1

## Designated contracting state (EPC)

BE DE ES FR GB IT NL

## DOCDB simple family (publication)

**EP 0462380 A2 19911227**; **EP 0462380 A3 19931006**; **EP 0462380 B1 19961113**; AU 632228 B2 19921217; AU 7597191 A 19920102; CA 2041403 A1 19911221; CA 2041403 C 19970422; DE 69123088 D1 19961219; DE 69123088 T2 19970306; JP H0452230 A 19920220; JP H0756051 B2 19950614; KR 920000957 A 19920129; KR 930004809 B1 19930608

## DOCDB simple family (application)

**EP 91106841 A 19910426**; AU 7597191 A 19910426; CA 2041403 A 19910429; DE 69123088 T 19910426; JP 15985690 A 19900620; KR 910007515 A 19910510