Title (en)

SPRING STEEL, METHOD FOR PRODUCING A SPRING USING SAID STEEL AND A SPRING MADE FROM SUCH STEEL

Title (de)

FEDERSTAHL, VERFAHREN ZUR HERSTELLUNG EINER FEDER AUS DIESEM STAHL UND EINE FEDER AUS DIESEM STAHL

Title (fr)

ACIER A RESSORTS, ET PROCEDE DE FABRICATION D'UN RESSORT UTILISANT CET ACIER, ET RESSORT REALISE EN UN TEL ACIER.

Publication

EP 1966407 B1 20091007 (FR)

Application

EP 06841905 A 20061211

Priority

- FR 2006002700 W 20061211
- FR 0512775 A 20051215

Abstract (en)

[origin: FR2894987A1] A spring steel has the following composition (by wt.%): (A) Carbon (C) = 0.45 - 0.70; (B) Silicon (Si) = 1.65 - 2.50; (C) Manganese (Mn) = 0.20 - 0.75; (D) Chromium (Cr) = 0.60 - 2; (E) Nickel (Ni) = 0.15 - 1; (F) Molybdenum (Mo) = traces - 1; (G) Vanadium (V) = 0.003 - 0.8; (H) Copper (Cu) = 0.10 - 1; (I) Titanium (Ti) = 0.020 - 0.2; (J) Niobium (Nb) = traces - 0.2; (K) Aluminum (Al) = 0.002 - 0.050; (L) Phosphorus (P) = traces - 0.015; (M) Sulfer (S) = traces - 0.015; (N) Oxygen (O) = traces - 0.0020; (O) Nitrogen (N) = 0.0020 - 0.0110; (P) Remainder iron (Fe) and production impurities; (Q) a calculated carbon equivalent (C eq). Independent claims are also included for: (1) the fabrication of this spring steel; (2) a spring made from this steel.

IPC 8 full level

C22C 38/18 (2006.01); **C21D 9/02** (2006.01); **C22C 38/20** (2006.01); **C22C 38/24** (2006.01); **C22C 38/28** (2006.01); **C22C 38/40** (2006.01)

CPC (source: EP KR NO US)

C21D 8/06 (2013.01 - EP NO US); **C21D 8/065** (2013.01 - KR); **C21D 9/02** (2013.01 - EP NO US); **C22C 38/001** (2013.01 - KR); **C22C 38/02** (2013.01 - EP NO US); **C22C 38/04** (2013.01 - EP KR NO US); **C22C 38/06** (2013.01 - EP KR US); **C22C 38/34** (2013.01 - KR); **C22C 38/42** (2013.01 - EP KR NO US); **C22C 38/44** (2013.01 - EP KR NO US); **C22C 38/46** (2013.01 - EP KR NO US); **C22C 38/48** (2013.01 - EP KR NO US); **C22C 38/50** (2013.01 - EP KR NO US); C21D 2211/004 (2013.01 - EP KR US)

Cited by

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Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

Designated extension state (EPC)

AL BA HR MK RS

DOCDB simple family (publication)

FR 2894987 A1 20070622; **FR 2894987 B1 20080314**; AT E445026 T1 20091015; BR PI0619892 A2 20111025; BR PI0619892 B1 20160607; CA 2633153 A1 20070719; CA 2633153 C 20130507; CN 101400818 A 20090401; CN 101400818 B 20120829; DE 602006009705 D1 20091119; EP 1966407 A1 20080910; EP 1966407 B1 20091007; ES 2331539 T3 20100107; JP 2007224413 A 20070906; JP 4869051 B2 20120201; KR 101048946 B1 20110712; KR 20080090424 A 20081008; ME 01062 B 20121020; NO 20082766 L 20080714; NO 341748 B1 20180115; PL 1966407 T3 20100430; RS 51070 B 20101031; RU 2008128865 A 20100120; RU 2397270 C2 20100820; SI 1966407 T1 20091231; US 2008308195 A1 20081218; WO 2007080256 A1 20070719

DOCDB simple family (application)

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