

Title (en)

STEEL WIRE FOR SPRINGS HAVING EXCELLENT FATIGUE PROPERTIES, AND SPRING

Title (de)

STAHLDRAHT FÜR FEDERN MIT HERVORRAGENDEN ERMÜDUNGSEIGENSCHAFTEN UND FEDER

Title (fr)

FIL D'ACIER POUR RESSORTS POSSÉDANT D'EXCELLENTE PROPRIÉTÉS DE FATIGUE, ET RESSORT

Publication

EP 3101148 A4 20171101 (EN)

Application

EP 15744088 A 20150129

Priority

- JP 2014014633 A 20140129
- JP 2015052595 W 20150129

Abstract (en)

[origin: EP3101148A1] This steel wire for springs: contains specific amounts of C, Si, Mn, Cr, Al, Ca and Ti, with the remainder comprising iron and unavoidable impurities; has oxide inclusions, which are present in a cross section parallel to the longitudinal direction of the wire spring and have minor axes of at least 1 µm, containing specific amounts of CaO, Al₂O₃, SiO₂, MgO, MnO and TiO₂ The steel wire for springs satisfies CaO + Al₂O₃ + SiO₂ + MgO + MnO + TiO₂ #¥ 80%, and the number of oxide inclusions having a minor axis of 2 µm or greater present in the cross section exceeds 0.002/mm².

IPC 8 full level

C22C 38/00 (2006.01); **C21D 8/06** (2006.01); **C22C 38/02** (2006.01); **C22C 38/04** (2006.01); **C22C 38/06** (2006.01); **C22C 38/24** (2006.01); **C22C 38/28** (2006.01); **C22C 38/34** (2006.01); **C22C 38/38** (2006.01); **C22C 38/46** (2006.01); **C22C 38/50** (2006.01); **C22C 38/58** (2006.01)

CPC (source: EP KR US)

C21D 8/06 (2013.01 - KR); **C21D 9/02** (2013.01 - KR); **C22C 38/002** (2013.01 - EP KR US); **C22C 38/02** (2013.01 - EP KR US); **C22C 38/04** (2013.01 - EP KR US); **C22C 38/06** (2013.01 - EP KR US); **C22C 38/18** (2013.01 - KR); **C22C 38/24** (2013.01 - EP US); **C22C 38/28** (2013.01 - EP KR US); **C22C 38/34** (2013.01 - EP US); **C22C 38/38** (2013.01 - EP KR US); **C22C 38/46** (2013.01 - EP US); **C22C 38/50** (2013.01 - EP US); **C21D 8/06** (2013.01 - EP US); **C21D 2211/004** (2013.01 - EP KR US)

Citation (search report)

- [E] EP 2947168 A1 20151125 - KOBELSTEEL LTD [JP]
- [X] JP 2010024539 A 20100204 - KOBELSTEEL LTD
- [X] CN 101440455 A 20090527 - KOBELSTEEL LTD [JP]
- See references of WO 2015115574A1

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SE545842C2

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)

EP 3101148 A1 20161207; **EP 3101148 A4 20171101**; CN 105940132 A 20160914; CN 105940132 B 20180130; JP 2015163735 A 20150910; JP 2018193615 A 20181206; KR 101815410 B1 20180104; KR 20160104026 A 20160902; MX 2016009761 A 20161117; US 2016348221 A1 20161201; US 2018320255 A1 20181108; WO 2015115574 A1 20150806

DOCDB simple family (application)

EP 15744088 A 20150129; CN 201580006045 A 20150129; JP 2015012546 A 20150126; JP 2015052595 W 20150129; JP 2018134358 A 20180717; KR 20167020516 A 20150129; MX 2016009761 A 20150129; US 201515115185 A 20150129; US 201816036655 A 20180716