

Title (en)

STEEL SPRING WIRE, SPRING, STEEL SPRING WIRE PRODUCTION METHOD AND SPRING PRODUCTION METHOD

Title (de)

STAHLFEDERDRAHT, FEDER, STAHLFEDERDRAHTHERSTELLUNGSVERFAHREN UND FEDERHERSTELLUNGSVERFAHREN

Title (fr)

FIL POUR RESSORT EN ACIER, RESSORT, PROCÉDÉ DE PRODUCTION DE FIL POUR RESSORT EN ACIER ET PROCÉDÉ DE PRODUCTION DE RESSORT

Publication

**EP 3486344 A4 20190522 (EN)**

Application

**EP 17827290 A 20170608**

Priority

- JP 2016139668 A 20160714
- JP 2017038665 A 20170301
- JP 2017021367 W 20170608

Abstract (en)

[origin: EP3486344A1] A steel wire for a spring is formed of a steel containing from 0.5% by mass to 0.8% by mass of carbon, from 1.0% by mass to 2.5% by mass of silicon, from 0.2% by mass to 1.0% by mass of manganese, and from 0.5% by mass to 2.5% by mass of chromium, the balance being iron and incidental impurities. The steel has a tempered martensite structure. The hardness of a surface region that is a region within 10 µm from an outer surface is from more than 0 HV to 50 HV higher than the hardness of a region other than the surface region.

IPC 8 full level

**C22C 38/00** (2006.01); **B21C 3/02** (2006.01); **B21F 35/00** (2006.01); **C21D 1/06** (2006.01); **C21D 7/06** (2006.01); **C21D 8/06** (2006.01); **C21D 9/02** (2006.01); **C22C 38/02** (2006.01); **C22C 38/04** (2006.01); **C22C 38/24** (2006.01); **C22C 38/34** (2006.01)

CPC (source: EP US)

**B21C 1/003** (2013.01 - EP US); **B21C 3/02** (2013.01 - EP US); **B21F 35/00** (2013.01 - EP US); **C21D 1/06** (2013.01 - EP US); **C21D 7/06** (2013.01 - EP US); **C21D 8/065** (2013.01 - EP US); **C21D 9/02** (2013.01 - EP US); **C22C 38/02** (2013.01 - EP US); **C22C 38/04** (2013.01 - EP US); **C22C 38/24** (2013.01 - EP US); **C22C 38/34** (2013.01 - EP US); **C21D 221/008** (2013.01 - EP US)

Citation (search report)

- [X] EP 2896712 A1 20150722 - NHK SPRING CO LTD [JP]
- [X] JP 2014206219 A 20141030 - NHK SPRING CO LTD
- [A] EP 2682493 A1 20140108 - NHK SPRING CO LTD [JP]
- See references of WO 2018012158A1

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

Designated extension state (EPC)

BA ME

DOCDB simple family (publication)

**EP 3486344 A1 20190522**; **EP 3486344 A4 20190522**; CN 109415788 A 20190301; JP 6891889 B2 20210618; JP WO2018012158 A1 20190425; US 2019233912 A1 20190801; WO 2018012158 A1 20180118

DOCDB simple family (application)

**EP 17827290 A 20170608**; CN 201780042912 A 20170608; JP 2017021367 W 20170608; JP 2018527446 A 20170608; US 201716317732 A 20170608