

Title (en)
MECHANICAL STRUCTURE STEEL FOR COLD-WORKING AND MANUFACTURING METHOD THEREFOR

Title (de)
STAHL FÜR MECHANISCHE STRUKTUREN ZUR KALTBEARBEITUNG UND HERSTELLUNGSVERFAHREN DAFÜR

Title (fr)
ACIER POUR STRUCTURE MÉCANIQUE POUR TRAVAIL À FROID ET SON PROCÉDÉ DE FABRICATION

Publication
EP 3342892 A4 20190116 (EN)

Application
EP 16839120 A 20160812

Priority
• JP 2015166030 A 20150825
• JP 2016124959 A 20160623
• JP 2016073769 W 20160812

Abstract (en)
[origin: EP3342892A1] To provide a mechanical structure steel for cold-working that enables the achievement of the spheroidization equal to or better than that in a prior steel and can also be more softened than the prior steel, even when the time for the spheroidizing annealing is shorter than a usual spheroidizing annealing time; and a method for manufacturing the mechanical structure steel. The present disclosure relates to a mechanical structure steel for cold-working that includes C, Si, Mn, P, S, Al, and N and has a metal microstructure including proeutectoid ferrite and pearlite, in which a total area ratio of the proeutectoid ferrite and the pearlite with respect to the entire microstructure is 90% or more, while an area ratio A_f of the proeutectoid ferrite with respect to the entire microstructure satisfies a relationship of $A_f \geq A$ where an A value is represented by formula (1) below, an average circle equivalent diameter of a bcc-Fe crystal grain is in a range of 15 to 30 μm , and a pearlite lamellar spacing is 0.20 μm or less on average: $A = 103 \times 128 \times C \% \times 0.80 \%$ where [C (%)] in the formula (1) indicates the C content in percent by mass.

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 38/14** (2006.01); **C22C 38/60** (2006.01)

CPC (source: EP KR US)
C21D 1/18 (2013.01 - EP US); **C21D 1/32** (2013.01 - EP US); **C21D 8/06** (2013.01 - EP KR US); **C21D 8/065** (2013.01 - EP US); **C21D 11/005** (2013.01 - KR); **C22C 38/00** (2013.01 - EP US); **C22C 38/001** (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 38/14** (2013.01 - EP US); **C22C 38/60** (2013.01 - EP US); **C21D 2211/005** (2013.01 - EP KR US); **C21D 2211/009** (2013.01 - EP KR US); **C21D 2261/00** (2013.01 - EP US)

Citation (search report)
• [I] EP 2796586 A1 20141029 - KOBE STEEL LTD [JP]
• [Y] JP 2013007089 A 20130110 - KOBE STEEL LTD
• [Y] JP H0953142 A 19970225 - SUMITOMO METAL IND
• See references of WO 2017033773A1

Cited by
EP3875628A4

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 3342892 A1 20180704; **EP 3342892 A4 20190116**; CN 107923011 A 20180417; JP 2017043835 A 20170302; KR 20180031757 A 20180328; KR 20190124826 A 20191105; MX 2018001887 A 20180620; TW 201715055 A 20170501; TW I606124 B 20171121; US 2018251876 A1 20180906

DOCDB simple family (application)
EP 16839120 A 20160812; CN 201680046277 A 20160812; JP 2016124959 A 20160623; KR 20187005299 A 20160812; KR 20197032067 A 20160812; MX 2018001887 A 20160812; TW 105127086 A 20160824; US 201615754364 A 20160812