Title (en)

STEEL MATERIAL AND PRODUCTION METHOD THEREFOR

Title (de)

STAHLMATERIAL UND HERSTELLUNGSVERFAHREN DAFÜR

Title (fr)

MATÉRIAU EN ACIER ET SON PROCÉDÉ DE FABRICATION

Publication

EP 3835446 A4 20211013 (EN)

Application

EP 19859087 A 20190904

Priority

- JP 2018170656 A 20180912
- JP 2019034830 W 20190904

Abstract (en)

[origin: EP3835446A1] Provided are a steel material and a method of producing the same. The steel material has a chemical composition containing, in mass%, C: 0.10-2.50 %, Mn: 8.0-45.0 %, P: ≤ 0.300 %, S: ≤ 0.1000 %, Ti: 0.10-5.00 %, Al: 0.001-5.000 %, N: ≤ 0.5000 %, and O: ≤ 0.1000 %, where C, Ti, and Mn satisfy 25([C] - 12.01[Ti]/47.87) + [Mn] ≥ 25 ([C], [Ti] and [Mn] are a content of each element in mass%), with the balance being Fe and inevitable impurities, and a microstructure containing ≥ 90 % of an austenite phase and ≥ 0.2 % of Ti carbides in area ratio. Such a microstructure can be obtained by heating the steel material having the chemical composition to a temperature of ≥ 950 °C, and then cooling the steel material at a cooling rate of > 1 °C/s in a temperature range between 900-500 °C. A steel material excellent in wear resistance is thus obtained. By adjusting the hardness of the austenite phase to ≥ 200 HV, the impact wear resistance is remarkably improved.

IPC 8 full level

C22C 38/00 (2006.01); **C21D 8/02** (2006.01); **C21D 9/46** (2006.01); **C22C 30/02** (2006.01); **C22C 37/00** (2006.01); **C22C 37/08** (2006.01); **C22C 38/60** (2006.01)

CPC (source: EP KR)

C21D 6/001 (2013.01 - EP); **C21D 6/002** (2013.01 - EP); **C21D 6/004** (2013.01 - EP); **C21D 6/005** (2013.01 - EP); **C21D 8/021** (2013.01 - EP); **C21D 8/0226** (2013.01 - EP KR); **C21D 8/0263** (2013.01 - EP); **C21D 9/46** (2013.01 - EP KR); **C22C 30/00** (2013.01 - EP); **C22C 30/02** (2013.01 - KR); **C22C 37/08** (2013.01 - KR); **C22C 38/00** (2013.01 - EP); **C22C 38/001** (2013.01 - EP KR); **C22C 38/002** (2013.01 - EP); **C22C 38/005** (2013.01 - EP); **C22C 38/02** (2013.01 - EP); **C22C 38/04** (2013.01 - EP KR); **C22C 38/06** (2013.01 - EP KR); **C22C 38/08** (2013.01 - EP); **C22C 38/12** (2013.01 - EP); **C22C 38/14** (2013.01 - EP KR); **C22C 38/16** (2013.01 - EP); **C22C 38/26** (2013.01 - EP); **C22C 38/28** (2013.01 - EP); **C22C 38/36** (2013.01 - EP); **C22C 38/38** (2013.01 - EP); **C22C 38/42** (2013.01 - KR); **C22C 38/44** (2013.01 - EP KR); **C22C 38/46** (2013.01 - EP KR); **C22C 38/48** (2013.01 - KR); **C22C 38/50** (2013.01 - EP); **C22C 38/54** (2013.01 - EP KR); **C22C 38/58** (2013.01 - EP); **C22C 38/60** (2013.01 - EP KR); C21D 2211/001 (2013.01 - EP KR); C21D 2211/004 (2013.01 - EP)

Citation (search report)

- [X] CN 105483539 A 20160413 - CENTRAL IRON & STEEL RES INST, et al
- [X] US 2015354037 A1 20151210 - LEE HAK-CHEOL [KR], et al
- [XI] US 4130418 A 19781219 - HARTVIG TOR
- [XI] US 4394168 A 19830719 - HARTVIG TOR [NO], et al
- [XI] EP 0692548 A1 19960117 - SHINHOKOKU STEEL CORP [JP]
- [XI] DE 4107417 A1 19911212 - GISAG AG GIESSEREI MASCH [DE]
- [XI] JP H09241806 A 19970916 - NIPPON YAKIN KOGYO CO LTD
- See references of WO 2020054553A1

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

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