

Title (en)
Heat resisting steel, gas turbine using the steel, and components thereof

Title (de)
Wärmebeständiger Stahl sowie daraus hergestellte Gasturbine und Bauteile

Title (fr)
Acier résistant à la chaleur et turbine à gaz et composants réalisées en cet acier

Publication
EP 1466993 A1 20041013 (EN)

Application
EP 04001026 A 20040119

Priority
JP 2003101401 A 20030404

Abstract (en)
The invention is of a heat resisting martensitic steel comprising, by weight, 0.05 to 0.30% C, not more than 0.50% Si, not more than 0.60% Mn, 8.0 to 13.0% Cr, 0.5 to 3.0% Ni, 1.0 to 3.0% Mo, 0.1 to 1.5% W, 0.5 to 4% Co, 0.05 to 0.35% V, 0.02 to 0.30% in total of one or two elements selected from the group consisting of Nb and Ta, and 0.02 to 0.10% N, wherein a value of the square of a difference between the Ni amount and the Co amount, and the Ni amount are not more than values determined by a straight line drawn on a point A (1.0, 2.7%) and a point B (2.5, 1.0%) in the orthogonal coordinates shown in the attached drawing of Fig. 2 which represents a relationship between the above square value and the Ni amount, and an amount ratio of Mo/(Mo + 0.5W) is not less than 0.5. The heat resisting steel is suitably used in various components of a gas turbine.

IPC 1-7
C22C 38/44; **C22C 38/46**; **C22C 38/52**; **C22C 38/54**

IPC 8 full level
F01D 5/06 (2006.01); **C22C 38/00** (2006.01); **C22C 38/44** (2006.01); **C22C 38/46** (2006.01); **C22C 38/52** (2006.01); **C22C 38/54** (2006.01); **F01D 5/28** (2006.01); **F02C 7/00** (2006.01)

CPC (source: EP US)
C22C 38/001 (2013.01 - EP US); **C22C 38/002** (2013.01 - EP US); **C22C 38/02** (2013.01 - EP US); **C22C 38/04** (2013.01 - EP US); **C22C 38/44** (2013.01 - EP US); **C22C 38/46** (2013.01 - EP US); **C22C 38/48** (2013.01 - EP US); **C22C 38/52** (2013.01 - EP US); **C22C 38/54** (2013.01 - EP US)

Citation (search report)
• [A] EP 0770696 A1 19970502 - MITSUBISHI HEAVY IND LTD [JP]
• [A] EP 0867523 A1 19980930 - MITSUBISHI HEAVY IND LTD [JP]
• [DA] EP 0691416 A1 19960110 - JAPAN STEEL WORKS LTD [JP], et al
• [DA] EP 0688883 A1 19951227 - NIPPON STEEL CORP [JP], et al
• [A] PATENT ABSTRACTS OF JAPAN vol. 1998, no. 06 30 April 1998 (1998-04-30)
• [A] SPIEKERMANN P: "LEGIERUNGEN - EIN BESONDERES PATENTRECHTLICHES PROBLEM? - LEGIERUNGSPRUEFUNG IM EUROPÄISCHEN PATENTAMT -", MITTEILUNGEN DER DEUTSCHEN PATENTANWÄLTE, HEYMANN, KOLN., DE, 1993, pages 178 - 190, XP000961882, ISSN: 0026-6884 & SPIEKERMANN P: "Alloys - a special problem of patent law", 1993, NONPUBLISHED ENGLISH TRANSLATION OF DOCUMENT ABOVE, XP002184689

Cited by
CN104831160A; RU2615931C1; RU2757923C1; RU2598725C2; EP2478988A1; CH704427A1; CN102601538A; US11634803B2; US10458007B2; US10094007B2; WO2014066570A1

Designated contracting state (EPC)
DE FR GB SE

DOCDB simple family (publication)
EP 1466993 A1 20041013; **EP 1466993 B1 20070418**; DE 602004005910 D1 20070531; DE 602004005910 T2 20071206; JP 2004307910 A 20041104; JP 3921574 B2 20070530; US 2005074356 A1 20050407; US 2009068052 A1 20090312

DOCDB simple family (application)
EP 04001026 A 20040119; DE 602004005910 T 20040119; JP 2003101401 A 20030404; US 15355208 A 20080521; US 75784704 A 20040116