

## Title (en)

High-temperature member for use in gas turbine

## Title (de)

Hochtemperaturbeständiges Glied zur Verwendung in Gasturbinen

## Title (fr)

Élément stable à températures élevées pour turbines à gaz

## Publication

**EP 1507015 A1 20050216 (EN)**

## Application

**EP 04018928 A 20040810**

## Priority

JP 2003206999 A 20030811

## Abstract (en)

A high-temperature member for use in a gas turbine is formed from a cobalt-based alloy comprising 15-35 wt% of chromium; 0.02-1.5 wt% of silicon; 0.01-0.2 wt% of carbon; at least one kind of metal selected from the group consisting of niobium, tungsten, tantalum and rhenium, the total content of these four metals being controlled not to exceed 10 % by atomic ratio of the entirety of the alloy excluding carbon; and at least one metal selected from the group consisting of nickel, manganese and iron, the total content of these metals being within a range of 1-9 wt%, the total content of nickel being controlled not to exceed 5 wt%, and the cobalt-based alloy having both of excellent resistance due to work hardening of the matrix and excellent ductility under room temperature. Then, in order to improve the high-temperature wear resistance, a pre-hardened layer is formed in the surface portion (8) of the member (3, 4) by shot peening. <IMAGE>

## IPC 1-7

**C22C 19/07**; **F01D 5/02**; **F01D 5/28**

## IPC 8 full level

**C22C 19/07** (2006.01); **F01D 5/28** (2006.01); **F01D 9/02** (2006.01); **F02C 7/00** (2006.01); **F02C 7/28** (2006.01); **C21D 7/06** (2006.01)

## CPC (source: EP US)

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## Citation (search report)

- [X] US 5002731 A 19910326 - CROOK PAUL [US], et al
- [A] US 4659632 A 19870421 - MORIKAWA MASAKI [JP], et al
- [A] VANDERMOUSEN, R. F. ET AL: "Directional solidification of cobalt -base superalloys", COBALT (ENGLISH EDITION) , (1), 6-12 CODEN: COBAAP; ISSN: 0010-0048, 1974, XP009040458
- [A] ENG, R. D. C. ET AL: "Microstructure of W1-52 cast cobalt base high- temperature alloy", JOURNAL OF THE INSTITUTE OF METALS , 100(APRIL), 120-4 CODEN: JIMEAP; ISSN: 0020-2975, 1972, XP009040464
- [A] BIZON, P. T. ET AL: "Thermal -stress fatigue behavior of twenty - six superalloys", ASTM SPECIAL TECHNICAL PUBLICATION , 612(THERM. FATIGUE MATER. COMPONENTS, SYMP., 1975), 106-22 CODEN: ASTTA8; ISSN: 0066-0558, 1976, XP009040460
- [A] JOHNSTON, JAMES R. ET AL: "Effect of cyclic conditions on the dynamic oxidation of gas turbine superalloys", NASA TECH. NOTE , NASA TN D-7614, 21 PP. CODEN: NASCA3, 1974, XP009040459

## Cited by

CN111088448A; EP3533972A1; CN110207148A; US11391168B2; US8431859B2

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