



(12) **CORRECTED EUROPEAN PATENT APPLICATION**

published in accordance with Art. 158(3) EPC

Note: Bibliography reflects the latest situation

(15) Correction information:

**Corrected version no 1 (W1 A1)**

**Bibliography INID code(s) 72**

(51) Int Cl.:

**C22C 38/00** <sup>(2006.01)</sup> **C21D 9/30** <sup>(2006.01)</sup>

**C22C 38/14** <sup>(2006.01)</sup> **C22C 38/60** <sup>(2006.01)</sup>

**C23C 8/26** <sup>(2006.01)</sup>

(48) Corrigendum issued on:

**23.04.2008 Bulletin 2008/17**

(86) International application number:

**PCT/JP2006/302433**

(43) Date of publication:

**21.11.2007 Bulletin 2007/47**

(87) International publication number:

**WO 2006/090604 (31.08.2006 Gazette 2006/35)**

(21) Application number: **06713575.6**

(22) Date of filing: **13.02.2006**

(84) Designated Contracting States:

**DE GB**

(30) Priority: **25.02.2005 JP 2005051775**

(71) Applicants:

- **SUMITOMO METAL INDUSTRIES, LTD.**  
**Osaka-shi,**  
**Osaka 541-0041 (JP)**
- **HONDA MOTOR CO., LTD.**  
**Tokyo 107-8556 (JP)**

(72) Inventors:

- **SANO, Naoyuki**  
**c/o Sumitomo Metal Industries, Ltd.**  
**Osaka-shi, Osaka 541-0041 (JP)**
- **MATSUMOTO, Hitoshi**  
**c/o Sumitomo Metals (Kokura), Ltd.**  
**Kitakyushu-shi, Fukuoka 802-8686 (JP)**

• **NAKATANI, Takayuki**

**c/o Sumitomo Metal Industries, Ltd.**  
**Osaka-shi, Osaka 541-0041 (JP)**

• **KAMADA, Yoshihiko**

**c/o Sumitomo Metal Industries, Ltd.**  
**Osaka-shi, Osaka 541-0041 (JP)**

• **AMANO, Masaki**

**c/o Honda R & D Co., Ltd.**  
**Wako-shi, Saitama 351-0193 (JP)**

• **ASAI, Tetsuya**

**c/o Honda R & D Co., Ltd.**  
**Wako-shi, Saitama 351-0193 (JP)**

(74) Representative: **Herzog, Markus**

**Weickmann & Weickmann**

**Patentanwälte**

**Postfach 86 08 20**

**81635 München (DE)**

(54) **NON-TEMPERED STEEL SOFT NITRIDED COMPONENT**

(57) Soft-nitrided parts wherein a ferrite grain in the diffusion layer does not have a  $\gamma'$  nitride of more than 20  $\mu\text{m}$  in the longitudinal axis, which is made of a non-heat treated steel that has a chemical composition of, by mass %, C:0.30 to 0.45%, Si:0.1 to 0.5%, Mn:0.6 to 1.0%, Ti:0.005 to 0.1%, N:0.010 to 0.030%, and the balance Fe and impurities, and that has a mixed microstructure of bainite and ferrite whose bainite fraction is 5 to 90% or a mixed microstructure of bainite, ferrite and pearlite whose bainite fraction is 5 to 90%.

The non-heat treated steel may contain one or more elements of 0.001 to 0.1% of Nb, 0.01 to 1.0% of Mo; 0.01 to 1.0% of Cu, 0.01 to 1.0% of Ni and 0.001 to 0.005% of B, 0.01 to 0.1% of S and 0.0001 to 0.005% of Ca.

This invention provides machinery parts, based on this non-heat treated steel for soft-nitriding, which has

further improved high fatigue strength and excellent bending straightening property after soft-nitrided even omitting thermal refining.

Fig.1

