(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 017 363 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
05.08.2009 Bulletin 2009/32

(43) Date of publication A2:
21.01.2009 Bulletin 2009/04

(21) Application number: **08159197.6**

(22) Date of filing: **04.06.2003**

(51) Int Cl.:
C22C 38/02 *(2006.01)* ***C22C 38/04*** *(2006.01)*
C22C 38/06 *(2006.01)*

(84) Designated Contracting States:
DE SE

(30) Priority: **14.06.2002 JP 2002173668**
14.06.2002 JP 2002173669

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
03736017.9 / 1 514 951

(71) Applicant: **JFE Steel Corporation**
Tokyo, 100-0011 (JP)

(72) Inventors:
- **Hasegawa, Kohei**
  c/o Intellectual Prop. Dept. JFE Steel corp.
  Tokyo 100-0011 (JP)
- **Matsuda, Hiroshi**
  c/o Intellectual Prop. Dept. JFE Steel corp.
  Tokyo 100-0011 (JP)
- **Kitano, Fusato**
  c/o Intellectual Prop. Dept. JFE Steel corp.
  Tokyo 100-0011 (JP)
- **Kawamura, Kenji**
  c/o Intellectual Prop. Dept. JFE Steel corp.
  Tokyo 100-0011 (JP)
- **Tsurumaru, Hideyuki**
  c/o Intellectual Prop. Dept. JFE Steel corp.
  Tokyo 100-0011 (JP)

(74) Representative: **HOFFMANN EITLE**
Patent- und Rechtsanwälte
Arabellastraße 4
81925 München (DE)

(54) High strength cold-rolled steel sheet and method for manufacturing the same

(57) A high strength cold-rolled steel plate which has a chemical composition in mass%: C: 0.04 to 0.10%, Si: 0.5 to 1.5%, Mn: 1.8 to 3%, P: 0.02% or less, S: 0.01% or less, Sol.Al: 0.01 to 0.1%, N: 0.005% or less, and the balance: Fe and inevitable impurities, and has a metal structure consisting substantially of a ferrite phase and a martensite phase. The high strength cold-rolled steel plate exhibits good ductility of an elongation of 18% or more and excellent stretch-flanging property of a bore expanding percentage of 60% or more, in combination with a tensile strength of 780 MPa or more, and thus can be suitably used for a structural member of an automobile.

EP 2 017 363 A3

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 08 15 9197

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
E	EP 1 512 762 A (JFE STEEL CORP [JP]) 9 March 2005 (2005-03-09) * example 2; table 1 * * example 1 * * example 2; table 2 *	1,2	INV. C22C38/02 C22C38/04 C22C38/06
A	JP 10 147838 A (KOBE STEEL LTD) 2 June 1998 (1998-06-02) * abstract * * paragraphs [0033] - [0038] * * paragraphs [0041], [0057] *	1,2	
A	EP 1 201 780 A (NIPPON STEEL CORP [JP]) 2 May 2002 (2002-05-02) * abstract * * example 0 *	1,2	
A	JP 04 333524 A (NIPPON STEEL CORP) 20 November 1992 (1992-11-20) * abstract *	1,2	
A	JP 2002 161336 A (NIPPON KOKAN KK) 4 June 2002 (2002-06-04) * abstract *	1,2	TECHNICAL FIELDS SEARCHED (IPC) C22C C21D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	6 November 2008	Morra, Valentina

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 08 15 9197

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

06-11-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1512762 A	09-03-2005	WO 03104499 A1	18-12-2003
		JP 2004010991 A	15-01-2004
		US 2004177905 A1	16-09-2004
JP 10147838 A	02-06-1998	JP 3370875 B2	27-01-2003
EP 1201780 A	02-05-2002	DE 60018940 D1	28-04-2005
		WO 0181640 A1	01-11-2001
		TW 261072 B	01-09-2006
		US 2002179193 A1	05-12-2002
JP 4333524 A	20-11-1992	NONE	
JP 2002161336 A	04-06-2002	JP 3729108 B2	21-12-2005

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82