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(11) **EP 1 433 866 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
07.07.2004 Bulletin 2004/28

(51) Int Cl.7: **C22C 21/02**, C22C 21/08,
C22F 1/05

(43) Date of publication A2:
30.06.2004 Bulletin 2004/27

(21) Application number: **03029804.6**

(22) Date of filing: **23.12.2003**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**
Designated Extension States:
AL LT LV MK

- **YEH Jieh-Ren**
Pittsburgh PA 15220 (US)
- **Brichet Claude E**
CH 4125 Riehen (CH)
- **SAENZ DE MIERA Vincente Martin**
Jaca 22700 Huesca (ES)

(30) Priority: **23.12.2002 US 436123 P**

(71) Applicant: **Alcoa Inc.**
Pittsburgh, PA 15212-5858 (US)

(74) Representative: **Carstairs, J. C.**
Forrester & Boehmert,
Pettenkoferstrasse 20-22
80336 München (DE)

(72) Inventors:
• **Butler jr. John**
Lititz PA 17543 (US)

(54) **Crash resistant aluminium alloy sheet products and method of making same**

(57) Aluminum sheet products having high strengths and favorable crashworthiness are disclosed. The aluminum alloys include Si, Mg and Mn in controlled amounts which provide high yield strengths while retaining formability and crash resistant properties. The sheet

products undergo heat treatment and slow quenching. The sheet products are particularly suitable for use as auto body sheet products.

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EUROPEAN SEARCH REPORT

Application Number
EP 03 02 9804

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 00/52216 A (ALUSUISSE LONZA SERVICES AG ;BASSI CORRADO (CH); TIMM JUERGEN (DE)) 8 September 2000 (2000-09-08) See Abstract * table 12 * * page 1, line 4 - line 6 * * page 6, line 7 - line 16 * * page 5, line 11 - line 32 * * page 7, line 1 - line 2 * ---	1-60	C22C21/02 C22C21/08 C22F1/05
A	EP 0 811 700 A (ALUSUISSE LONZA SERVICES AG) 10 December 1997 (1997-12-10) See whole document. ---	1-60	
A	WO 97/44501 A (ALUSUISSE LONZA SERVICES AG ;SCHWELLINGER PIUS (DE)) 27 November 1997 (1997-11-27) See whole document. ---	1-60	
A	EP 0 805 219 A (ALUMINUM CO OF AMERICA) 5 November 1997 (1997-11-05) See whole document. ---	1-60	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	WO 02/090609 A (LLOYD DAVID JAMES ;ALCAN INT LTD (CA); BULL MICHAEL JACKSON (US)) 14 November 2002 (2002-11-14) See whole document. ---	1-60	C22C C22F
A	FR 2 273 077 A (CEGEDUR) 26 December 1975 (1975-12-26) See whole document. ---	1-60	
A	J.R. DAVIS: "Metals Handbook - Desk Edition" 1989 , ASM INTERNATIONAL , USA XP002278912 * page 429 * -----	1-60	
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 4 May 2004	Examiner Brown, A
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 03 02 9804

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.

04-05-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0052216	A	08-09-2000	CH 693673 A5	15-12-2003
			AT 240414 T	15-05-2003
			BR 0008629 A	18-12-2001
			CA 2363116 A1	08-09-2000
			WO 0052216 A1	08-09-2000
			CZ 20013107 A3	14-08-2002
			DE 50002180 D1	18-06-2003
			DK 1165848 T3	11-08-2003
			EP 1165848 A1	02-01-2002
			ES 2193048 T3	01-11-2003
			JP 2002538305 A	12-11-2002
			TW 530093 B	01-05-2003

EP 0811700	A	10-12-1997	CH 690916 A5	28-02-2001
			AT 219158 T	15-06-2002
			DE 59707470 D1	18-07-2002
			EP 0811700 A1	10-12-1997
			ES 2177920 T3	16-12-2002

WO 9744501	A	27-11-1997	EP 0808911 A1	26-11-1997
			AT 205261 T	15-09-2001
			AU 2688197 A	09-12-1997
			WO 9744501 A1	27-11-1997
			DE 59704542 D1	11-10-2001
			EP 0902842 A1	24-03-1999
			ES 2162285 T3	16-12-2001
			US 6685782 B1	03-02-2004
			ZA 9704318 A	30-01-1998

EP 0805219	A	05-11-1997	EP 0805219 A1	05-11-1997

WO 02090609	A	14-11-2002	WO 02090609 A1	14-11-2002
			CA 2445671 A1	14-11-2002
			EP 1392877 A1	03-03-2004
			US 2003029531 A1	13-02-2003

FR 2273077	A	26-12-1975	FR 2273077 A1	26-12-1975

EPO FORM P0459

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