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(88) Date of publication of the international search report:
21 February 2008

(54) Title: AA7000-SERIES ALUMINIUM ALLOY PRODUCTS AND A METHOD OF MANUFACTURING THEREOF

(57) Abstract: This invention relates to an AA7000-series alloy comprising 3 to 10% Zn, 1 to 3% Mg, at most 2.5% Cu, Fe <0.25%, and Si >0.12 to 0.35%, and to a method of manufacturing these aluminium alloy products. More particularly, the invention relates to aluminium wrought products in relatively thick gauges, in particular i.e. about 30 to 300 mm thick. While typically practiced on rolled plate product forms, this invention may also find use with manufacturing extrusions or forged product shapes. Representative structural component parts made from the alloy product include integral spar members and the like which are machined from thick wrought sections, including rolled plate.



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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2007/005973

A. CLASSIFICATION OF SUBJECT MATTER
 INV. C22F1/053 C22C21/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 C22F C22C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, CHEM ABS Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 846 669 A1 (PECHINEY RHENALU [FR]) 7 May 2004 (2004-05-07) the whole document	1-20, 22-30
X	WO 92/03586 A (COMALCO ALU [AU]) 5 March 1992 (1992-03-05) the whole document	1-30
X	FR 2 066 696 A (ALUSUISSE) 6 August 1971 (1971-08-06) the whole document	1-20, 23-30
X	FR 2 234 375 A1 (PECHINEY ALUMINIUM [FR]) 17 January 1975 (1975-01-17) the whole document	1-30
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

18 December 2007

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17/01/2008

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Patton, Guy

INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HUFNAGEL W: "Key to Aluminium Alloys, 4th Edition" 1991, ALUMINIUM-SCHLUESSEL = KEY TO ALUMINIUM ALLOYS, PAGE(S) 195-205 , XP002194851 page 202 - page 204 -----	27-30
X	FR 1 508 123 A (PECHINEY PROD CHIMIQUES SA) 5 January 1968 (1968-01-05) the whole document -----	1-9, 11-30
X	GB 952 288 A (ALUMINUM CO OF AMERICA) 11 March 1964 (1964-03-11) the whole document -----	1-19,21, 23-30
X	US 3 674 448 A (BROWN ROBERT H ET AL) 4 July 1972 (1972-07-04) the whole document -----	1-19,21, 23-30

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2007/005973

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: —
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.

2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
1-30

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: -

The initial phase of the search revealed a very large number of documents relevant to the issue of novelty. So many documents were retrieved that it is impossible to determine which parts of the claims 27-30 may be said to define subject-matter for which protection might legitimately be sought (Art. 6 PCT). Indeed, independent claim 27 is drafted as a "product-by-process" claim and, hence, its subject-matter is considered to be novel and inventive only if the product itself is found novel and inventive. The process features for obtaining the product do not limit the scope of the claim unless they produce unambiguous identifiable features on the product which is not the case in present claim. Consequently, any product exhibiting the claimed composition would destroy the novelty of the subject-matter of claim 27. Since the claimed composition broadly overlaps the ones of standard 7000 aluminium alloys as illustrated by the Hufnagel publication cited in present search report (see Hufnagel, p. 202-204, for instance alloys 7001, 7004, 7005, 7009, 7014, 7017, 7019, 7019A, 7020, 7021, 7022, 7023, 7028, 7039, 7049A, 7051, 7075, 7076, 7277, 7278) a large number of documents were retrieved taking away novelty of the subject-matter of claim 27. The same applies to dependent claims 28-30 since the specified uses are usual for 7000 series alloys.

In view of the fact that the claimed range for Si is also usual for above cited 7000-series alloys, the process of claim 1 relates to an extremely large number of possible processed alloys. Support and disclosure in the sense of Article 6 and 5 PCT is to be found however for only a very small proportion of the processed alloys, see in the description of present application: example 1, alloy 2; example 2, alloy 3; example 3, alloy 5. The same applies to dependent claims 3-20, 23-26 which refer to 7000 series alloys in general.

For these reasons, the search was performed taking into consideration the non-compliance in determining the extent of the search of claims 1, 3-20, 23-30.

The search of claim 1 was therefore restricted to a method which appears to be supported, i.e. the method of claim 1 with an alloy composition according to claim 2.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.2), should the problems which led to the Article 17(2)PCT declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-20,23-30

Heat treatment at a temperature of more than 500°C performed after the homogenisation heat treatment prior to hot working (alternative (i) of claim 1)

2. claims: 1,21

Heat treatment at a temperature of more than 500°C performed after the solution heat treatment (alternative (ii) of claim 1)

3. claims: 1,22

Heat treatment at a temperature of more than 500°C performed both after the homogenisation heat treatment prior to hot working and after the solution heat treatment (alternative (iii) of claim 1)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2007/005973

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