



(11) **EP 3 342 897 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
19.09.2018 Bulletin 2018/38

(51) Int Cl.:
C22F 1/04 ^(2006.01) **C22C 1/10** ^(2006.01)
C22C 21/00 ^(2006.01) **C22C 32/00** ^(2006.01)

(43) Date of publication A2:
04.07.2018 Bulletin 2018/27

(21) Application number: **18150026.5**

(22) Date of filing: **02.01.2018**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD TN

(30) Priority: **30.12.2016 KR 20160183446**

(71) Applicant: **University-Industry Foundation(UIF), Yonsei University Seoul 03722 (KR)**

(72) Inventors:
• **BAE, Dong Hyun 04637 Seoul (KR)**
• **JEON, Je Heon 03727 Seoul (KR)**

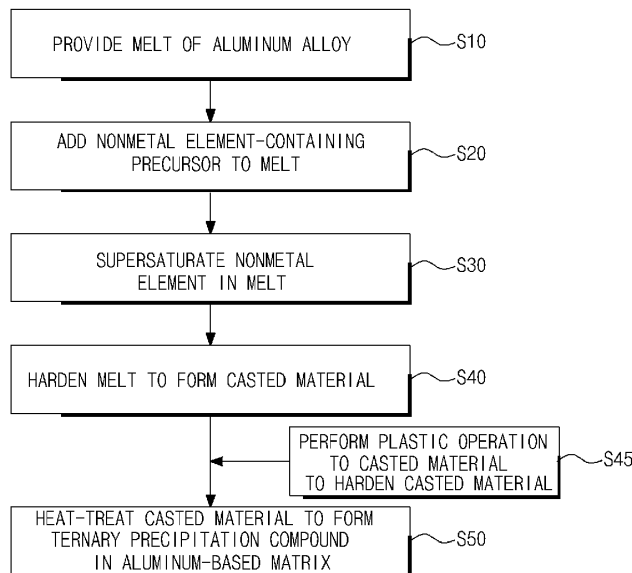
(74) Representative: **Platzöder, Michael Christian Wallinger Ricker Schlotter Tostmann Patent- und Rechtsanwälte Partnerschaft mbB Zweibrückenstrasse 5-7 80331 München (DE)**

(54) **ENGINEERED ALUMINUM ALLOY AND METHOD OF FABRICATING THE SAME**

(57) Provided are an aluminum alloy having an adjusted microstructure in an aluminum matrix or an aluminum alloy matrix for high elongation ratio or high strength and a method of fabricating the same. The aluminum alloy includes an aluminum-based matrix; and a precip-

itation compound dispersed in the aluminum-based matrix. The precipitation compound comprises a compound containing aluminum, one or more transition metals, and one or more non-metallic elements.

FIG. 4



EP 3 342 897 A3



EUROPEAN SEARCH REPORT

Application Number
EP 18 15 0026

5

10

15

20

25

30

35

40

45

50

55

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|---|---|--|--|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
| A | JP S60 159137 A (HITACHI LTD) 20 August 1985 (1985-08-20) * page 2; examples 1-5; table 1 * ----- | 1-6 | INV. C22F1/04 C22C1/10 C22C21/00 C22C32/00 |
| X | JP H01 177331 A (TECHNICAL RES ASSOC INC) 13 July 1989 (1989-07-13) * page 7, column 2 - column 3; example 1 * ----- | 1-6 | |
| | | | TECHNICAL FIELDS SEARCHED (IPC) |
| | | | C22F C22C |
| -The present search report has been drawn up for all claims | | | |
| Place of search Munich | | Date of completion of the search 19 April 2018 | Examiner Liu, Yonghe |
| 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 03/02 (P04C01)



5

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

10

Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

15

No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

20

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

25

see sheet B

30

All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

35

As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

40

Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

45

None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

50

1-6(partially)

55

The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

**LACK OF UNITY OF INVENTION
SHEET B**Application Number
EP 18 15 0026

5

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

10

1. claims: 1-6(partially)

An aluminum alloy comprising a precipitation compound containing aluminum, one transition metal, and one or more non-metallic elements.

15

2. claims: 7-14(completely); 1-6(partially)

An aluminum alloy comprising a precipitation compound containing aluminum, two or more transition metals, and one or more non-metallic elements.

20

25

30

35

40

45

50

55

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 18 15 0026

5 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.

19-04-2018

| 10 | Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|----|---|---------------------|----------------------------|---------------------|
| | JP S60159137 A | 20-08-1985 | NONE | |
| | ----- | | | |
| 15 | JP H01177331 A | 13-07-1989 | JP H036979 B2 | 31-01-1991 |
| | | | JP H01177331 A | 13-07-1989 |
| | ----- | | | |
| 20 | | | | |
| 25 | | | | |
| 30 | | | | |
| 35 | | | | |
| 40 | | | | |
| 45 | | | | |
| 50 | | | | |
| 55 | | | | |

EPO FORM P0459

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