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(54) **Method for forming a nickel-based layered structure on a magnesium alloy substrate, a surface-treated magnesium alloy article made therefrom, and a cleaning solution and a surface treatment solution used therefor**

(57) This invention relates to a method for forming a nickel-based layered structure and a boundary layer containing a solid solution of magnesium and an M-metal (32) on a magnesium alloy substrate (1). A surface-treat-

ed magnesium alloy article made from the above method, and a cleaning solution and a surface treatment solution used in the above method are also disclosed.

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**PARTIAL EUROPEAN SEARCH REPORT**

Application Number

which under Rule 63 of the European Patent Convention EP 07 25 2058 shall be considered, for the purposes of subsequent proceedings, as the European search report

<b>DOCUMENTS CONSIDERED TO BE RELEVANT</b>			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 3 672 964 A (BELLIS HAROLD EDWARD) 27 June 1972 (1972-06-27)  * claims 1,2,6-8; example 1; tables I,II * * column 1, lines 37-40 * * column 2, lines 50-67 * -----	1,2, 20-31, 33-40, 43-47, 50-62	INV. C23C18/16 C23C18/18 C23C18/50 C23C26/00 C23C22/57
X	US 6 068 938 A (KATO JUN [JP] ET AL) 30 May 2000 (2000-05-30)  * claims 1,3,5,6 * * column 1, lines 28-31 * * example 3; tables 2,3 * Number 4 and 8 ----- -/--	1,2, 20-31, 33-40, 43-47, 50-62	TECHNICAL FIELDS SEARCHED (IPC)  C23C
<b>INCOMPLETE SEARCH</b>			
<p>The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims.</p> <p>Claims searched completely :</p> <p>Claims searched incompletely :</p> <p>Claims not searched :</p> <p>Reason for the limitation of the search:</p> <p>see sheet C</p>			
5	Place of search <b>The Hague</b>	Date of completion of the search <b>6 February 2009</b>	Examiner <b>Gault, Nathalie</b>
<b>CATEGORY OF CITED DOCUMENTS</b> 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	

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## PARTIAL EUROPEAN SEARCH REPORT

Application Number

EP 07 25 2058

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	<p>J.S. LIAN, G.Y. LI, L.Y. NIU, C.D. GU, Z.H. JIANG, Q. JIANG: "Electroless Ni-P deposition plus zinc phosphate coating on AZ91D magnesium alloy"</p> <p>SURFACE &amp; COATINGS TECHNOLOGY, no. 200, 2006, pages 5956-5962, XP002513374 available online 24 October 2005</p> <p>Abstract* tables 1,2 *</p> <p>* page 5957, left-hand column *</p> <p>* page 5962, left-hand column *</p> <p>-----</p>	<p>1,2, 20-30, 33-40, 43-47, 50-62</p>	
			TECHNICAL FIELDS SEARCHED (IPC)



# INCOMPLETE SEARCH SHEET C

Application Number

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Claim(s) searched completely:  
1,2,20-31,33-40,43-47,50-62

Claim(s) not searched:  
3-19,32,41,42,48,49,63-81

Reason for the limitation of the search (non-patentable invention(s)):

The present application contains 81 claims. There are so many dependent claims, and they are drafted in such a way that the claims as a whole are not in compliance with the provisions of clarity and conciseness of Article 84 EPC, as they erect a smoke screen in front of the skilled reader when assessing what should be the subject-matter to search. The non-compliance with the substantive provisions is to such an extent, that a meaningful search of the whole claimed subject-matter could not be carried out (Rule 63 EPC and Guidelines B-VIII, 3).

The extent of the search was consequently limited to claims 1,2,20-31,33-40,43-47,50-62, which appear to comprise a reasonable definition of what is understood to be the invention for which protection is sought.

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Further limitation of the search

Claim(s) searched completely:  
1,2,20-31,33-40,43-47,50-62

Claim(s) not searched:  
3-9,32,41,42,48,49,63-81

Reason for the limitation of the search:

The present application contains 81 claims. There are so many dependent claims, and they are drafted in such a way that the claims as a whole are not in compliance with the provisions of clarity and conciseness of Article 84 EPC, as they erect a smoke screen in front of the skilled reader when assessing what should be the subject-matter to search. The non-compliance with the substantive provisions is to such an extent, that a meaningful search of the whole claimed subject-matter could not be carried out (Rule 63 EPC and Guidelines B-VIII, 3).

The extent of the search was consequently limited to claims 1,2,20-31,33-40,43-47,50-62, which appear to comprise a reasonable definition of what is understood to be the invention for which protection is sought.



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**CLAIMS INCURRING FEES**

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

☐ 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):

☐ 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.

**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:

see sheet B

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

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

☐ 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:

☒ 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:

1, 2, 20-31, 33-40, 43-47, 50-62

☐ 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 07 25 2058

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:

1. claims: 1,2,20-31,33-40,43-47,50-62

method and article thereof for forming a nickel based layered structure on a magnesium alloy substrate containing a transition layer containing Ni crystals and crystals of an M metal

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2. claims: 3-19,32,41,42,48,49,63-69

Method of treating a magnesium alloy article through cleaning solution and/or chemical polishing steps as well as cleaning solution thereof

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3. claims: 70-81

Surface treatment composition

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

EP 07 25 2058

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.

06-02-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3672964 A	27-06-1972	CA 962538 A1	11-02-1975
		DE 2213161 A1	28-09-1972
		GB 1386375 A	05-03-1975
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US 6068938 A	30-05-2000	JP 3715743 B2	16-11-2005
		JP 10287986 A	27-10-1998
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