Europäisches Patentamt
European Patent Office
Office européen des brevets

SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application number:
EP 21 91 50 31

Classification of the application (IPC):
C25D 3/56, ***C25D 5/00***, ***C25D 17/10***, ***C25D 21/00***, ***C25D 5/50***, ***C25D 7/06***, *C25D 21/14*

Technical fields searched (IPC):
C25D

DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
X	EP 3481976 B1 (DR ING MAX SCHLOETTER GMBH & CO KG [DE]) 15 April 2020 (2020-04-15) * claim 1 * * paragraphs [0001], [0069], [0071] *	1-7, 11
X	US 2007023280 A1 (ECKLES WILLIAM E [US] ET AL) 01 February 2007 (2007-02-01) * abstract * * examples 1, 2, 12 * * paragraph [0002] *	1-7, 11

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search	Date of completion of the search	Examiner
The Hague	13 May 2024	Lange, Ronny

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

EP 4 269 663 A4

Europäisches Patentamt
European Patent Office
Office européen des brevets

SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application number:
EP 21 91 50 31

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:

1. claims: 2-7(completely); 1, 11(all partially)
Inventive concept I regards a method for electroplating an article with metal, comprising the step of applying current in a plating bath comprising ions of the metal and an organic compound additive, wherein the plating bath comprises the article as a cathode and a conductive substrate having a layer comprising oxide or nitride of nickel and iron formed on a surface thereof as an anode, wherein the metal comprises zinc, wherein the plating bath is an alkaline plating bath, and/or wherein the organic compound additive comprises at least one selected from the group consisting of amine-based chelating agents, brightening agents, smoothing agents, and defoamers.

2. claims: 8-10, 12, 13(completely); 1, 11(all partially)
Inventive concept II regards a method for electroplating an article with metal, comprising the step of applying current in a plating bath comprising ions of the metal and an organic compound additive, wherein the plating bath comprises the article as a cathode and a conductive substrate having a layer comprising oxide or nitride of nickel and iron formed on a surface thereof as an anode, wherein the layer comprising the oxide or nitride is formed by oxidizing or nitriding a conductive substrate having a plating film comprising nickel and iron, a conductive substrate comprising iron and having a plating film containing nickel, a conductive substrate comprising nickel and having a plating film comprising iron, or a conductive substrate comprising nickel and iron. Inventive concept II also concerns the respective method for producing an electrode comprising a conductive substrate having a layer comprising oxide or nitride of nickel and iron formed on a surface thereof, the method comprising the step of:performing oxidation treatment or nitridation treatment on a conductive substrate having a plating film comprising nickel and iron, a conductive substrate comprising iron and having a plating film comprising nickel, a conductive substrate comprising nickel and having a plating film comprising iron, or a conductive substrate comprising nickel and iron to form the layer comprising the oxide or nitride of nickel and iron on the surface of the conductive substrate.

3. claim: 14
Inventive concept III regards a method for repairing an electrode comprising a conductive substrate having a layer comprising oxide of nickel and iron formed on a surface thereof, in which electrode the layer comprising the oxide is partly damaged on the surface, the method comprising the step of heating the electrode in an ambient atmosphere or an oxidizing atmosphere, wherein the conductive substrate has a plating film comprising nickel and iron under the layer comprising the oxide of nickel and iron, or contains iron and has a plating film comprising nickel under the layer comprising the oxide of nickel and iron, or contains nickel and has a plating film comprising iron under the layer comprising the oxide of nickel and iron, or comprises nickel and iron.

None of the further search fees have been paid within the fixed time limit. The present (supplementary) European search report has been drawn up for those parts of the European patent application which relate to the first mentioned in the claims, namely claims: 2-7(completely); 1, 11(partially)

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search	Date of completion of the search	Examiner
The Hague	13 May 2024	Lange, Ronny

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

EP 4 269 663 A4

Europäisches Patentamt
European Patent Office
Office européen des brevets

ANNEX TO SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application number:
EP 21 91 50 31

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 13-05-2024
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 3481976 B1	15-04-2020	BR 112019004029 A2	20-08-2019
		CN 110325669 A	11-10-2019
		DK 3481976 T3	18-05-2020
		EP 3358045 A1	08-08-2018
		EP 3481976 A1	15-05-2019
		ES 2790584 T3	28-10-2020
		HR P20200760 T1	16-10-2020
		HU E049752 T2	28-10-2020
		JP 6644952 B2	12-02-2020
		JP 2019530800 A	24-10-2019
		KR 20190099388 A	27-08-2019
		PH 12019500424 A1	27-05-2019
		PL 3481976 T3	02-11-2020
		PT 3481976 T	18-05-2020
		RU 2724765 C1	25-06-2020
		SI 3481976 T1	31-08-2020
		TW 201842211 A	01-12-2018
		US 2019376200 A1	12-12-2019
		WO 2018146041 A1	16-08-2018
US 2007023280 A1	01-02-2007	*NONE*	

EP 4 269 663 A4