

Title (en)

METHOD FOR ELECTROLYTICALLY DEPOSITING A CHROMIUM OR CHROMIUM ALLOY LAYER ON AT LEAST ONE SUBSTRATE

Title (de)

VERFAHREN ZUR ELEKTROLYTISCHEN ABSCHIEDUNG EINER CHROM- ODER CHROMLEGIERUNGSSCHICHT AUF MINDESTENS EINEM SUBSTRAT

Title (fr)

PROCÉDÉ DE DÉPÔT ÉLECTROLYTIQUE D'UNE COUCHE DE CHROME OU D'ALLIAGE DE CHROME SUR AU MOINS UN SUBSTRAT

Publication

**EP 4170071 A1 20230426 (EN)**

Application

**EP 22214580 A 20180404**

Priority

- EP 17164736 A 20170404
- EP 18714275 A 20180404
- EP 2018058591 W 20180404

Abstract (en)

The present invention relates to a method for electrolytically depositing a chromium or chromium alloy layer on at least one substrate, the method comprising the steps(a) providing an aqueous deposition bath with a pH in the range from 4.1 to 7.0,- comprising trivalent chromium ions,- comprising 0 mg/L to 200 mg/L hexavalent chromium, based on the total volume of the deposition bath, and- not comprising boron containing compounds,(b) providing the at least one substrate and at least one anode,(c) immersing the at least one substrate in the aqueous deposition bath and applying an electrical direct current such that the chromium or chromium alloy layer is deposited on the at least one substrate, wherein the at least one substrate forms the cathode having a total cathodic current density and the at least one anode having a total anodic current density, with the proviso that- the total anodic current density is  $6 \text{ A/dm}^2$  or more,- the total cathodic current density is  $18 \text{ A/dm}^2$  or more,- the at least one substrate and the at least one anode are present in the deposition bath such that the trivalent chromium ions are in contact with the at least one anode.

IPC 8 full level

**C25D 3/06** (2006.01); **C25D 5/00** (2006.01); **C25D 17/10** (2006.01)

CPC (source: EP US)

**C25D 3/06** (2013.01 - EP US); **C25D 5/619** (2020.08 - EP US); **C25D 17/10** (2013.01 - EP)

Citation (applicant)

- US 4477315 A 19841016 - TOMASZEWSKI THADDEUS W [US]
- WO 2015110627 A1 20150730 - COVENTYA S P A [IT]
- EP 3106544 A2 20161221 - MUÑOZ GARCIA CARLOS ENRIQUE [CO], et al
- US 2748069 A 19560529 - GEORGES IEXI JEAN JACQUES
- RU 2139369 C1 19991010 - VINOGRADOV SERGEJ STANISLAVOVI [RU], et al

Citation (search report)

- [X] US 2748069 A 19560529 - GEORGES IEXI JEAN JACQUES
- [I] RU 2139369 C1 19991010 - VINOGRADOV SERGEJ STANISLAVOVI [RU], et al
- [I] EP 2899299 A1 20150729 - COVENTYA S P A [IT] & WO 2015110627 A1 20150730 - COVENTYA S P A [IT]
- [A] WO 2015177315 A1 20151126 - TATA STEEL IJMUIDEN BV [NL]

Designated contracting state (EPC)

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

DOCDB simple family (publication)

**WO 2018185154 A1 20181011**; CN 110446802 A 20191112; CN 110446802 B 20230228; CN 115961315 A 20230414; EP 3607116 A1 20200212; EP 3607116 B1 20221221; EP 4170071 A1 20230426; ES 2940623 T3 20230509; FI 3607116 T3 20230330; LT 3607116 T 20230612; PL 3607116 T3 20230807

DOCDB simple family (application)

**EP 2018058591 W 20180404**; CN 201880022274 A 20180404; CN 202310089178 A 20180404; EP 18714275 A 20180404; EP 22214580 A 20180404; ES 18714275 T 20180404; FI 18714275 T 20180404; LT 18058591 T 20180404; PL 18714275 T 20180404