

CPC**COOPERATIVE PATENT CLASSIFICATION****C25D**

PROCESSES FOR THE ELECTROLYTIC OR ELECTROPHORETIC PRODUCTION OF COATINGS; ELECTROFORMING (decorating textiles by metallising [D06Q 1/04](#); manufacturing printed circuits by metal deposition [H05K 3/18](#));
APPARATUS THEREFOR

WARNING

The following IPC groups are not used in the CPC system. Subject matter covered by these groups is classified in the following CPC groups : [C25D 5/24](#) covered by [C25D 5/34](#)[C25D 5/26](#) covered by [C25D 5/36](#)[C25D 5/28](#) covered by [C25D 5/38](#)[C25D 5/30](#) covered by [C25D 5/42](#), [C25D 5/44](#)[C25D 5/32](#) covered by [C25D 5/46](#)[C25D 13/06](#) covered by [C09D 5/44](#)[C25D 13/08](#) covered by [C09D 5/4476](#)[C25D 13/10](#) covered by [C09D 5/448](#)[C25D 19/00](#) covered by [C25D 17/00](#)

C25D 1/00**Electroforming****C25D 1/003**

- . { 3D structures, e.g. superposed patterned layers }

C25D 1/006

- . { Nanostructures, e.g. aluminum anodic oxidation templates [AAO] }

C25D 1/02

- . Tubes; Rings; Hollow bodies

C25D 1/04

- . Wires; Strips; Foils

C25D 1/06

- . Wholly-metallic mirrors

C25D 1/08

- . Perforated or foraminous objects, e.g. sieves ([C25D 1/10](#) takes precedence)

C25D 1/10

- . Moulds; Masks; Masterforms { , e.g. mandrels, stampers }

C25D 1/12

- . by electrophoresis {(electrophoretic coating [C25D 13/00](#))}

C25D 1/14

- .. of inorganic material

C25D 1/16

- ... Metals

C25D 1/18

- .. of organic material

C25D 1/20

- . Separation of the formed objects from the electrodes { with no destruction of said electrodes }

C25D 1/22

- .. Separating compounds

C25D 3/00**Electroplating: Baths therefor****C25D 3/02**

- . from solutions ([C25D 5/24](#) to [C25D 5/32](#) take precedence)

C25D 3/04

- .. of chromium

C25D 3/06	...	from solutions of trivalent chromium
C25D 3/08	...	Deposition of black chromium { , e.g. hexavalent chromium, CrVI }
C25D 3/10	...	characterised by the organic bath constituents used
C25D 3/12	..	of nickel or cobalt {(C25D 3/56 takes precedence)}
C25D 3/14	...	from baths containing acetylenic or heterocyclic compounds
C25D 3/16	Acetylenic compounds
C25D 3/18	Heterocyclic compounds
C25D 3/20	..	of iron
C25D 3/22	..	of zinc
C25D 3/24	...	from cyanide baths
C25D 3/26	..	of cadmium
C25D 3/28	...	from cyanide baths
C25D 3/30	..	of tin
C25D 3/32	...	characterised by the organic bath constituents used
C25D 3/34	..	of lead
C25D 3/36	...	characterised by the organic bath constituents used
C25D 3/38	..	of copper
C25D 3/40	...	from cyanide baths { , e.g. with Cu+ }
C25D 3/42	..	of light metals
C25D 3/44	...	Aluminium
C25D 3/46	..	of silver
C25D 3/48	..	of gold
C25D 3/50	..	of platinum group metals
C25D 3/52	...	characterised by the organic bath constituents used
C25D 3/54	..	of metals not provided for in groups C25D 3/04 to C25D 3/50
C25D 3/56	..	of alloys
C25D 3/562	...	{ containing more than 50% by weight of iron or nickel or cobalt { ; NiP, FeP, CoP (Phosphatising C25D 11/36)} }
C25D 3/565	...	{ containing more than 50% by weight of zinc }
C25D 3/567	...	{ containing more than 50% by weight of platinum group metals }
C25D 3/58	...	containing more than 50% by weight of copper
C25D 3/60	...	containing more than 50% by weight of of tin { ; SnP }
C25D 3/62	...	containing more than 50% by weight of gold
C25D 3/64	...	containing more than 50% by weight of silver
C25D 3/66	.	from melts
C25D 3/665	..	{ from ionic liquids }

WARNING

Group [C25D 3/665](#) is not complete, pending reorganization, see also [C25D 3/66](#)

C25D 5/00

Electroplating characterised by the process; Pretreatment or after-treatment of work-pieces

C25D 5/003

- . { Electroplating characterised by the use of gases, e.g. pressure influence (removal or gases or vapours, [C25D 21/04](#)) }

WARNING

Groups **C25D 5/00B**, [C25D 5/006](#) are not complete, pending reorganization, see also [C25D 5/00](#)

C25D 5/006

- . { Electroplating with applied electromagnetic field, not locally , e.g. for plating magnetic layers }

C25D 5/02

- . Electroplating of selected surface areas

C25D 5/022

- .. { using masking means {([C25D 11/022](#) takes precedence)} }

C25D 5/024

- .. { using locally applied electromagnetic radiation e.g. lasers }

C25D 5/026

- .. { using locally applied jets of electrolyte }

C25D 5/028

- .. { one side electroplating { , e.g. substrate conveyed in a bath with inhibited background plating } }

C25D 5/04

- . Electroplating with moving electrodes

C25D 5/06

- .. Brush or pad plating {(electrodes for pad plating [C25D 17/14](#))}

C25D 5/08

- . Electroplating with moving electrolyte { , characterised by electrolyte flow }, e.g. jet electroplating {(spraying of electrolyte on wires strip or foils [C25D 7/0642](#), means or devices for moving the electrolyte [C25D 21/10](#), [C25D 5/026](#) takes precedence)}

C25D 5/10

- . Electroplating with more than one layer of the same or of different metals (for bearings [C25D 7/10](#))

C25D 5/12

- .. at least one layer being of nickel or chromium

C25D 5/14

- ... two or more layers being of nickel or chromium, e.g. duplex or triplex layers

C25D 5/16

- . Electroplating with layers of varying thickness { , e.g. rough surfaces } { ; Hull cells }

C25D 5/18

- . Electroplating using modulated, pulsed or reversing current

C25D 5/20

- . Electroplating using ultrasonics { , vibrations }

C25D 5/22

- . Electroplating combined with mechanical treatment during the deposition

C25D 5/34

- . Pretreatment of metallic surfaces to be electroplated

C25D 5/36

- .. of iron or steel

C25D 5/38

- .. of refractory metals or nickel

- C25D 5/40 . . . Nickel; Chromium
- C25D 5/42 . . of light metals
- C25D 5/44 . . . Aluminium
- C25D 5/46 . . of actinides
- C25D 5/48 . After-treatment of electroplated surfaces
- C25D 5/50 . . by heat-treatment
- C25D 5/505 . . . { of electroplated tin coatings, e.g. by melting }
- C25D 5/52 . . by brightening or burnishing
- C25D 5/54 . Electroplating { on } non-metallic surfaces { ,e.g. on carbon or carbon composites }
(C25D 7/12 takes precedence)
- C25D 5/56 . . on { thin or conductive } plastics {(coating metallic material C23C)}

C25D 7/00 Electroplating characterised by the article coated

- C25D 7/001 . { Magnets }

WARNING

Groups **C25D 7/00B**-C25D 7/008 are not complete, pending reorganization, see also C25D 7/00

- C25D 7/003 . { Threaded pieces, e.g. bolts, nuts }
- C25D 7/005 . { Jewels or clockworks }
- C25D 7/006 . { Nanoparticles }
- C25D 7/008 . { Thermal barrier coatings }
- C25D 7/02 . Slide fasteners
- C25D 7/04 . Tubes; Rings; Hollow bodies
- C25D 7/06 . Wires; Strips; Foils
- C25D 7/0607 . . { Wires }
- C25D 7/0614 . . { Strips or foils }
- C25D 7/0621 . . . { In horizontal cells }
- C25D 7/0628 . . . { In vertical cells }
- C25D 7/0635 . . . { In radial cells }
- C25D 7/0642 . . . { Anodes }
- C25D 7/065 . . . { Diaphragms }
- C25D 7/0657 . . . { Conducting rolls }
- C25D 7/0664 . . . { Isolating rolls }

- C25D 7/0671 . . . { Selective plating }
- C25D 7/0678 . . . { using masks }
- C25D 7/0685 . . . { Spraying of electrolyte }
- C25D 7/0692 . . . { Regulating the thickness of the coating }
- C25D 7/08 . Mirrors; Reflectors
- C25D 7/10 . Bearings
- C25D 7/12 . Semiconductors { without seed layer }
- C25D 7/123 . . { Semiconductors first coated with a seed layer for filling vias }

WARNING

Groups **C25D 7/12B**-[C25D 7/126](#) are not complete, pending reorganization, see also [C25D 7/12](#)

- C25D 7/126 . . { Semiconductors first coated with a seed layer for solar cells }

C25D 9/00 **Electrolytic coating other than with metals** ([C25D 11/00](#), [C25D 15/00](#) take precedence; electrophoretic coating [C25D 13/00](#))

- C25D 9/02 . with organic materials
- C25D 9/04 . with inorganic materials
- C25D 9/06 . . by anodic processes
- C25D 9/08 . . by cathodic processes
- C25D 9/10 . . . on iron or steel
- C25D 9/12 . . . on light metals

C25D 11/00 **Electrolytic coating by surface reaction, i.e. forming conversion layers**

- C25D 11/005 . { Apparatus specially adapted for electrolytic conversion coating (apparatus in general for electrolytic coating [C25D 17/00](#)) }

WARNING

Groups [C25D 11/005](#), [C25D 11/022](#)-**C25D 11/02F**, [C25D 11/045](#) are not complete, pending reorganization, see also [C25D 11/00](#)

- C25D 11/02 . Anodisation
- C25D 11/022 . . { Anodisation on selected surface areas }
- C25D 11/024 . . { Anodisation under pulsed or modulated current or potential }
- C25D 11/026 . . { Anodisation with spark discharge [ANOF] }
- C25D 11/028 . . { Borodising,, i.e. borides formed electrochemically }
- C25D 11/04 . . of aluminium or alloys based thereon

- C25D 11/045 . . . { for forming AAO templates }
- C25D 11/06 . . . characterised by the electrolytes used
- C25D 11/08 containing inorganic acids
- C25D 11/10 containing organic acids
- C25D 11/12 . . . Anodising more than once, e.g. in different baths
- C25D 11/14 . . . Producing integrally coloured layers
- C25D 11/16 . . . Pretreatment { , e.g. desmutting }
- C25D 11/18 . . . After-treatment, e.g. pore sealing (lacquering [B44D](#))
- C25D 11/20 Electrolytic after-treatment
- C25D 11/22 for colouring layers
- C25D 11/24 Chemical after-treatment
- C25D 11/243 { using organic dyestuffs }
- C25D 11/246 { for sealing layers }
- C25D 11/26 . . of refractory metals or alloys based thereon
- C25D 11/28 . . of actinides or alloys based thereon
- C25D 11/30 . . of magnesium or alloys based thereon
- C25D 11/32 . . of semiconducting materials
- C25D 11/34 . . of metals or alloys not provided for in groups [C25D 11/04](#) to [C25D 11/32](#)

- C25D 11/36 . Phosphatising { , e.g. NiP, CoP, FeP (bath solutions of NiP, CoP, FeP [C25D 3/562](#)) }
- C25D 11/38 . Chromatising

- C25D 13/00** **Electrophoretic coating** ([C25D 15/00](#) takes precedence; apparatus for continuously conveying articles into baths [B65G](#), e.g. [B65G 49/00](#))

- C25D 13/02 . with inorganic material
- C25D 13/04 . with organic material
- C25D 13/06 . . with polymers { not used, see [C09D 5/44](#) }
- C25D 13/08 . . . by polymerisation in situ of monomeric materials { not used, see [C09D 5/4476](#) }

- C25D 13/10 . characterised by the additives used { not used, see [C09D 5/448](#) }
- C25D 13/12 . characterised by the article coated
- C25D 13/14 . . Tubes; Rings; Hollow bodies
- C25D 13/16 . . Wires; Strips; Foils

- C25D 13/18 . using modulated, pulsed, or reversing current

- C25D 13/20 . Pre-treatment

- C25D 13/22 . Servicing or operating { apparatus or multistep processes }
- C25D 13/24 . . Regeneration of process liquids

- C25D 15/00** **Electrolytic or electrophoretic production of coatings containing { uncharged } embedded materials, e.g. particles, whiskers, wires**
- C25D 15/02 . Combined electrolytic and electrophoretic processes { with charged materials }
- C25D 17/00** **Constructional parts, or assemblies thereof, of cells for electrolytic coating**
 (apparatus for continuously conveying articles into baths [B65G](#), e.g. [B65G 49/00](#); electric devices see the relevant classes, e.g. [H01B](#), [H02G](#)) {([C25D 7/06](#), [C25D 11/005](#), [C25D 13/22](#), [C25](#) takes precedence)}
- C25D 17/001 . { Apparatus specially adapted for plating wafers, e.g. semiconductors, solar cells }
- WARNING**
- Groups [C25D 17/005](#)-[C25D 17/008](#) are not complete, pending reorganization, see also [C25D 17/00](#)
- C25D 17/002 . { Cell separation, e.g. membranes, diaphragms }
- C25D 17/004 . { Sealing devices }
- C25D 17/005 . { Contacting devices }
- C25D 17/007 . { Current conducting devices }
- C25D 17/008 . { Current insulating devices }
- C25D 17/02 . Tanks; Installations therefor
- C25D 17/04 .. External supporting frames or structures
- C25D 17/06 . Suspending or supporting devices for articles to be coated
- C25D 17/08 .. { Supporting } racks { i.e. not for suspending }
- C25D 17/10 . Electrodes { e.g. composition, counter electrode }
- C25D 17/12 .. Shape or form ([C25D 17/14](#) takes precedence)
- C25D 17/14 .. for pad-plating
- C25D 17/16 . Apparatus for electrolytic coating of small objects in bulk
- C25D 17/18 .. having closed containers
- C25D 17/20 ... Horizontal barrels
- C25D 17/22 .. having open containers
- C25D 17/24 ... Oblique barrels
- C25D 17/26 ... Oscillating baskets
- C25D 17/28 .. with means for moving the objects individually through the apparatus during treatment

C25D 21/00**Processes for servicing or operating cells for electrolytic coating**

C25D 21/02

- . Heating or cooling

C25D 21/04

- . Removal of gases or vapours { ; gas or pressure control (electroplating characterized by the use of gases [C25D 5/003](#))}

C25D 21/06

- . Filtering { particles other than ions (filtering ions [C25D 21/22](#))}

C25D 21/08

- . Rinsing

C25D 21/10

- . Agitating of electrolytes; Moving of racks

C25D 21/11

- . Use of protective surface layers on electrolytic baths

C25D 21/12

- . Process control or regulation (controlling or regulating in general [G05](#))

C25D 21/14

- .. Controlled addition of electrolyte components

C25D 21/16

- . Regeneration of process solutions {([C25D 13/24](#) takes precedence)}

C25D 21/18

- .. of electrolytes ([C25D 21/22](#) takes precedence)

C25D 21/20

- .. of rinse-solutions ([C25D 21/22](#) takes precedence)

C25D 21/22

- .. by ion-exchange