

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 5/34](#) to [C25D 5/46](#) 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 5/003](#), [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 7/001-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 7/123-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 11/028](#), [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