

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 ([C25D5/24](#) to [C25D5/32](#) 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)}
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WARNING

C25D 5/003

(continued)

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

C25D 7/001

(continued)

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