CPC  COOPERATIVE PATENT CLASSIFICATION

C  CHEMISTRY; METALLURGY

(NOTES omitted)

METALLURGY

C25  ELECTROLYTIC OR ELECTROPHORETIC PROCESSES; APPARATUS THEREFOR

(NOTES omitted)

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

WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
   - C25D 2/00 covered by C25D 5/24
   - C25D 5/24 covered by C25D 5/26
   - C25D 5/26 covered by C25D 5/28
   - C25D 5/30 covered by C25D 5/32
   - C25D 5/32 covered by C25D 13/06
   - C25D 13/06 covered by C09D 5/44
   - C25D 13/06 covered by C09D 5/4476
   - C25D 13/08 covered by C09D 5/448
   - C25D 19/00 covered by C25D 17/00

2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00 Electroforming

1/003 . 3D structures, e.g. superposed patterned layers
1/006 . NaNanostructures, e.g. using aluminium anodic oxidation templates [AAO]
1/02 . Tubes; Rings; Hollow bodies
1/04 . Wires; Strips; Foils
1/06 . Wholly-metallic mirrors
1/08 . Perforated or foraminous objects, e.g. sieves (C25D 1/10 takes precedence)
1/10 . Moulds; Masks; Masterforms {, e.g. mandrels, stampers}
1/12 . by electrophoresis (electrophoretic coating C25D 13/00)
1/14 . of inorganic material
1/16 . . Metals
1/18 . . of organic material
1/20 . Separation of the formed objects from the electrodes [with no destruction of said electrodes]
1/22 . Separating compounds

3/00 Electroplating: Baths therefor

3/02 . from solutions (C25D 5/34 - C25D 5/46 take precedence)
3/04 . . of chromium
3/06 . . . from solutions of trivalent chromium
3/08 . . . Deposition of black chromium {, e.g. hexavalent chromium, CrVI}
3/10 . . . characterised by the organic bath constituents used
3/12 . . . of nickel or cobalt {(C25D 3/56 takes precedence)}
3/14 . . . from baths containing acetylenic or heterocyclic compounds
3/16 . . . . Acetylenic compounds
3/18 . . . . Heterocyclic compounds
3/20 . . . of iron
3/22 . . . of zinc
3/24 . . . from cyanide baths
3/26 . . . of cadmium
3/28 . . . from cyanide baths
3/30 . . . of tin
3/32 . . . characterised by the organic bath constituents used
3/34 . . . of lead
3/36 . . . characterised by the organic bath constituents used
3/38 . . . of copper
3/40 . . . from cyanide baths {, e.g. with Cu+}
3/42 . . . of light metals
3/44 . . . Aluminium
3/46 . . . of silver
3/48 . . . of gold
3/50 . . . of platinum group metals
3/52 . . . characterised by the organic bath constituents used
3/54 . . . of metals not provided for in groups (C25D 3/04 - C25D 3/50)
3/56 . . . of alloys
3/562 . . . [containing more than 50% by weight of iron or nickel or cobalt; NiP, FeP, CoP (phosphating C25D 11/36)]
3/565 . . . [containing more than 50% by weight of zinc]
3/567 . . . [containing more than 50% by weight of platinum group metals]
3/58 . . . containing more than 50% by weight of copper
3/60 . . . containing more than 50% by weight of tin [: SnP]
3/62 . . . containing more than 50% by weight of gold
3/64 . . . containing more than 50% by weight of silver
3/66 . . . (from melts
3/665 . . . (from ionic liquids)

**WARNING**

Group C25D 3/665 is not complete, pending reorganization, see also C25D 3/66

5/00 Electroplating characterised by the process;

Pretreatment or after-treatment of workpieces

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

5/006 . . . [Electroplating with applied electromagnetic field, not locally, e.g. for plating magnetic layers]
5/02 . . . Electroplating of selected surface areas
5/022 . . . (using masking means (C25D 11/022 takes precedence))
5/024 . . . [using locally applied electromagnetic radiation, e.g. lasers]
5/026 . . . [using locally applied jets of electrolyte]
5/028 . . . [one side electroplating, e.g. substrate conveyed in a bath with inhibited background plating]
5/04 . . . Electroplating with moving electrodes
5/06 . . . Brush or pad plating [electrodes for pad plating C25D 17/14]
5/08 . . . Electroplating with moving electrolyte, [characterised by electrolyte flow], e.g. jet electroplating [(spraying of electrolyte on wires strip or foils C25D 7/064-2, means or devices for moving the electrolyte C25D 21/10, C25D 5/026 takes precedence)]
5/10 . . . Electroplating with more than one layer of the same or of different metals (for bearings C25D 7/10)
5/12 . . . at least one layer being of nickel or chromium
5/14 . . . two or more layers being of nickel or chromium, e.g. duplex or triplex layers
5/16 . . . Electroplating with layers of varying thickness, [: rough surfaces] (Hull cells)
5/18 . . . Electroplating using modulated, pulsed or reversing current
5/20 . . . Electroplating using ultrasonics [, vibrations]
5/22 . . . Electroplating combined with mechanical treatment during the deposition
5/34 . . . Pretreatment of metallic surfaces to be electroplated
5/36 . . . of iron or steel
5/38 . . . of refractory metals or nickel
5/40 . . . Nickel; Chromium
5/42 . . . of light metals
5/44 . . . Aluminium
5/46 . . . of actinides
5/48 . . . After-treatment of electroplated surfaces
5/50 . . . by heat-treatment
5/505 . . . [of electroplated tin coatings, e.g. by melting]
5/52 . . . by brightening or burnishing
5/54 . . . Electroplating [on] non-metallic surfaces, (e.g. on carbon or carbon composites) (C25D 7/12 takes precedence)
5/56 . . . on [thin or conductive] plastics [(coating metallic material C23C)]

**7/00** Electroplating characterised by the article coated

7/001 . . . [Magnets]

**WARNING**

Groups C25D 7/001-C25D 7/008 are not complete, pending reorganization, see also C25D 7/00

7/003 . . . [Threaded pieces, e.g. bolts, nuts]
7/005 . . . [Jewels or clockworks]
7/006 . . . [Nanoparticles]
7/008 . . . [Thermal barrier coatings]
7/02 . . . Slide fasteners
7/04 . . . Tubes; Rings; Hollow bodies
7/06 . . . Wires; Strips; Foils
7/0607 . . . [Wires]
7/0614 . . . [Strips or foils]
7/0621 . . . [In horizontal cells]
7/0628 . . . [In vertical cells]
7/0635 . . . [In radial cells]
7/0642 . . . [Anodes]
7/065 . . . [Diaphragms]
7/0657 . . . [Conducting rolls]
7/0664 . . . [Isolating rolls]
7/0671 . . . [Selective plating]
7/0678 . . . [using masks]
7/0685 . . . [Spraying of electrolyte]
7/0692 . . . [Regulating the thickness of the coating]
7/08 . . . Mirrors; Reflectors
7/10 . . . Bearings
7/12 . . . Semiconductors
7/123 . . . [coated first with a seed layer, e.g. for filling vias]

**WARNING**

Groups C25D 7/123-C25D 7/126 are not complete, pending reorganization, see also C25D 7/12

7/126 . . . [Semiconductors first coated with a seed layer for solar cells]

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

9/02 . . . with organic materials
9/04 . . . with inorganic materials
9/06 . . . by anodic processes
9/08 . . . by cathodic processes
9/10 . . . on iron or steel
9/12 . . . on light metals
Electrolytic coating by surface reaction, i.e. forming conversion layers

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

11/02 . Anodisation
11/022 . . [Anodisation on selected surface areas]
11/024 . . [Anodisation under pulsed or modulated current or potential]
11/026 . . [Anodisation with spark discharge]
11/028 . . [Borodising, i.e. borides formed electrochemically]
11/04 . . of aluminium or alloys based thereon
11/045 . . . [for forming AAO templates]
11/06 . . . characterised by the electrolytes used
11/08 . . . containing inorganic acids
11/10 . . . containing organic acids
11/12 . . Anodising more than once, e.g. in different baths
11/14 . . Producing integrally coloured layers
11/16 . . Pretreatment [e.g. desmutting]
11/18 . . After-treatment, e.g. pore-sealing
11/20 . . Electrolytic after-treatment
11/22 . . . for colouring layers
11/24 . . Chemical after-treatment
11/243 . . . [using organic dyestuffs]
11/246 . . . [for sealing layers]
11/26 . . of refractory metals or alloys based thereon
11/28 . . of actinides or alloys based thereon
11/30 . . of magnesium or alloys based thereon
11/32 . . of semiconducting materials
11/34 . . of metals or alloys not provided for in groups C25D 11/04 - C25D 11/52
11/38 . . Chromatising

**Electrophoretic coating characterised by the process** (C25D 15/00 takes precedence; compositions for electrophoretic coating C09D 5/44)

13/00 . with inorganic material
13/04 . with organic material
13/06 . . with polymers [not used, see C09D 5/44]
13/08 . . by polymerisation in situ of monomeric materials [not used, see C09D 5/44(48)]
13/10 . . characterised by the additives used [not used, see C09D 5/44(48)]
13/12 . . characterised by the article coated
13/14 . . Tubes; Rings; Hollow bodies
13/16 . . Wires; Strips; Foils
13/18 . . using modulated, pulsed, or reversing current
13/20 . . Pretreatment
13/22 . . Servicing or operating [apparatus or multistep processes]
13/24 . . Regeneration of process liquids

**Electrolytic or electrophoretic production of coatings containing embedded materials, e.g. particles, whiskers, wires**

15/00 . Combined electrolytic and electrophoretic processes [with charged materials]

**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)

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

17/002 . . [Cell separation, e.g. membranes, diaphragms]
17/004 . . [Sealing devices]
17/005 . . [Contacting devices]
17/007 . . [Current conducting devices]
17/008 . . [Current insulating devices]
17/02 . . Tanks; Installations therefor
17/04 . . External supporting frames or structures
17/06 . . Suspending or supporting devices for articles to be coated
17/08 . . . [Supporting] racks [i.e. not for suspending]
17/10 . . . Electrodes [i.e. composition, counter electrode]
17/12 . . . Shape or form (C25D 17/14 takes precedence)
17/14 . . . for pad-plating
17/16 . . . Apparatus for electrolytic coating of small objects in bulk
17/18 . . . having closed containers
17/20 . . . Horizontal barrels
17/22 . . . having open containers
17/24 . . . Oblique barrels
17/26 . . . Oscillating baskets
17/28 . . . with means for moving the objects individually through the apparatus during treatment

**Processes for servicing or operating cells for electrolytic coating**

21/00 . Heating or cooling
21/02 . . Removal of gases or vapours [: gas or pressure control (electroplating characterized by the use of gases C25D 5/003)]
21/06 . . Filtering (particles other than ions (filtering ions C25D 21/22)]
21/08 . . Rinsing
21/10 . . Agitating of electrolytes; Moving of racks
21/11 . . Use of protective surface layers on electrolytic baths
21/12 . . Process control or regulation (controlling or regulating in general G05)
21/14 . . Controlled addition of electrolyte components
21/16 . . Regeneration of process solutions (C25D 13/24 takes precedence)
21/18 . . . of electrolytes (C25D 21/22 takes precedence)
21/20 . . . of rinse-solutions (C25D 21/22 takes precedence)
21/22 . . . by ion-exchange