

CPC COOPERATIVE PATENT CLASSIFICATION

C CHEMISTRY; METALLURGY

(NOTES omitted)

METALLURGY

C25 ELECTROLYTIC OR ELECTROPHORETIC PROCESSES; APPARATUS THEREFOR

(electrodialysis, electro-osmosis, separation of liquids by electricity [B01D](#); {separation of isotopes by electrochemical methods [B01D 59/38](#)}; working of metal by the action of a high concentration of electric current [B23H](#); treatment of water, waste water or sewage by electrochemical methods [C02F 1/46](#); surface treatment of metallic material or coating involving at least one process provided for in class [C23](#) and at least one process covered by this class [C23C 28/00](#), [C23F 17/00](#); anodic or cathodic protection [C23F](#); single-crystal growth [C30B](#); metallising textiles [D06M 11/83](#); decorating textiles by locally metallising [D06Q 1/04](#); electrochemical methods of analysis [G01N](#); electrochemical measuring, indicating or recording devices [G01R](#); electrolytic circuit elements, e.g. capacitors, [H01G](#); electrochemical current or voltage generators [H01M](#))

(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

WARNING

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 | 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 |

1/00 Electroforming

- 1/003 . {3D structures, e.g. superposed patterned layers}
- 1/006 . {Nanostructures, 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 (phosphatising [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 7/0642](#), 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 {, e.g. 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 | 11/38 | . Chromatising |
| 7/12 | . Semiconductors | 13/00 | Electrophoretic coating characterised by the process (C25D 15/00 takes precedence; compositions for electrophoretic coating C09D 5/44) |
| 7/123 | . . {coated first with a seed layer, e.g. for filling vias} | 13/02 | . with inorganic material |
| | WARNING | 13/04 | . with organic material |
| | Groups C25D 7/123-C25D 7/126 are not complete, pending reorganization, see also C25D 7/12 | 13/06 | . . with polymers {(not used, see C09D 5/44)} |
| | | 13/08 | . . . by polymerisation <i>in situ</i> of monomeric materials {(not used, see C09D 5/4476)} |
| 7/126 | . . {Semiconductors first coated with a seed layer for solar cells} | 13/10 | . characterised by the additives used {(not used, see C09D 5/448)} |
| 9/00 | Electrolytic coating other than with metals (C25D 11/00 , C25D 15/00 take precedence; electrophoretic coating C25D 13/00) | 13/12 | . characterised by the article coated |
| 9/02 | . with organic materials | 13/14 | . . Tubes; Rings; Hollow bodies |
| 9/04 | . with inorganic materials | 13/16 | . . Wires; Strips; Foils |
| 9/06 | . . by anodic processes | 13/18 | . using modulated, pulsed, or reversing current |
| 9/08 | . . by cathodic processes | 13/20 | . Pretreatment |
| 9/10 | . . . on iron or steel | 13/22 | . Servicing or operating {apparatus or multistep processes} |
| 9/12 | . . . on light metals | 13/24 | . . Regeneration of process liquids |
| 11/00 | Electrolytic coating by surface reaction, i.e. forming conversion layers | 15/00 | Electrolytic or electrophoretic production of coatings containing embedded materials, e.g. particles, whiskers, wires |
| 11/005 | . {Apparatus specially adapted for electrolytic conversion coating (apparatus in general for electrolytic coating C25D 17/00)} | 15/02 | . Combined electrolytic and electrophoretic processes {with charged materials} |
| | WARNING | 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)} |
| | Groups C25D 11/005 , C25D 11/022-C25D 11/028 , C25D 11/045 are not complete, pending reorganization, see also C25D 11/00 | 17/001 | . {Apparatus specially adapted for plating wafers, e.g. semiconductors, solar cells} |
| 11/02 | . Anodisation | | WARNING |
| 11/022 | . . {Anodisation on selected surface areas} | | Groups C25D 17/005-C25D 17/008 are not complete, pending reorganization, see also C25D 17/00 |
| 11/024 | . . {Anodisation under pulsed or modulated current or potential} | 17/002 | . {Cell separation, e.g. membranes, diaphragms} |
| 11/026 | . . {Anodisation with spark discharge} | 17/004 | . {Sealing devices} |
| 11/028 | . . {Borodising, i.e. borides formed electrochemically} | 17/005 | . {Contacting devices} |
| 11/04 | . . of aluminium or alloys based thereon | 17/007 | . {Current conducting devices} |
| 11/045 | . . . {for forming AAO templates} | 17/008 | . {Current insulating devices} |
| 11/06 | . . . characterised by the electrolytes used | 17/02 | . Tanks; Installations therefor |
| 11/08 | containing inorganic acids | 17/04 | . . External supporting frames or structures |
| 11/10 | containing organic acids | 17/06 | . Suspending or supporting devices for articles to be coated |
| 11/12 | . . . Anodising more than once, e.g. in different baths | 17/08 | . . {Supporting} racks {, i.e. not for suspending} |
| 11/14 | . . . Producing integrally coloured layers | 17/10 | . Electrodes {, e.g. composition, counter electrode} |
| 11/16 | . . . Pretreatment {, e.g. desmutting} | 17/12 | . . Shape or form (C25D 17/14 takes precedence) |
| 11/18 | . . . After-treatment, e.g. pore-sealing | 17/14 | . . for pad-plating |
| 11/20 | Electrolytic after-treatment | 17/16 | . Apparatus for electrolytic coating of small objects in bulk |
| 11/22 | for colouring layers | 17/18 | . . having closed containers |
| 11/24 | Chemical after-treatment | 17/20 | . . . Horizontal barrels |
| 11/243 | {using organic dyestuffs} | 17/22 | . . having open containers |
| 11/246 | {for sealing layers} | 17/24 | . . . Oblique barrels |
| 11/26 | . . of refractory metals or alloys based thereon | 17/26 | . . . Oscillating baskets |
| 11/28 | . . of actinides or alloys based thereon | 17/28 | . . with means for moving the objects individually through the apparatus during treatment |
| 11/30 | . . of magnesium or alloys based thereon | 21/00 | Processes for servicing or operating cells for electrolytic coating |
| 11/32 | . . of semiconducting materials | | |
| 11/34 | . . of metals or alloys not provided for in groups C25D 11/04 - C25D 11/32 | | |
| 11/36 | . Phosphatising {, e.g. NiP, CoP, FeP (bath solutions of NiP, CoP, FeP C25D 3/562)} | | |

C25D

- 21/02 . Heating or cooling
- 21/04 . 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