### CPC - COOPERATIVE PATENT CLASSIFICATION

#### 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; 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:

<table>
<thead>
<tr>
<th>IPC</th>
<th>Covered by CPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>C25D 2/00</td>
<td>B23K 28/006</td>
</tr>
<tr>
<td>C25D 5/24</td>
<td>C25D 5/34</td>
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<tr>
<td>C25D 5/26</td>
<td>C25D 5/36</td>
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<tr>
<td>C25D 5/28</td>
<td>C25D 5/38</td>
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<tr>
<td>C25D 19/00</td>
<td>C25D 17/00</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Electroforming</th>
<th>Electroplating: Baths therefor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/00 Electroforming</td>
<td>3/00 Electroplating: Baths therefor</td>
</tr>
<tr>
<td>1/003 . (3D structures, e.g. superposed patterned layers)</td>
<td>3/04 . of chromium</td>
</tr>
<tr>
<td>1/006 . (Nanostructures, e.g. using aluminium anodic oxidation templates [AAO])</td>
<td>3/06 . from solutions of trivalent chromium</td>
</tr>
<tr>
<td>1/02 . Tubes; Rings; Hollow bodies</td>
<td>3/08 . Deposition of black chromium {, e.g. hexavalent chromium, CrVI}</td>
</tr>
<tr>
<td>1/04 . Wires; Strips; Foils</td>
<td>3/10 . characterised by the organic bath constituents used</td>
</tr>
<tr>
<td>1/06 . Wholly-metallic mirrors</td>
<td>3/12 . of nickel or cobalt</td>
</tr>
<tr>
<td>1/08 . Perforated or foraminous objects, e.g. sieves (C25D 1/10 takes precedence)</td>
<td>3/14 . from baths containing acetylenic or heterocyclic compounds</td>
</tr>
<tr>
<td>1/10 . Moulds; Masks; Masterforms</td>
<td>3/16 . Acetylenic compounds</td>
</tr>
<tr>
<td>1/12 . by electrophoresis</td>
<td>3/18 . Heterocyclic compounds</td>
</tr>
<tr>
<td>1/14 . of inorganic material</td>
<td>3/20 . of iron</td>
</tr>
<tr>
<td>1/16 . . Metals</td>
<td>3/22 . . of zinc</td>
</tr>
<tr>
<td>1/18 . . of organic material</td>
<td>1/20 . Separation of the formed objects from the electrodes [with no destruction of said electrodes]</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/24 . . from cyanide baths</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/26 . . of cadmium</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/28 . . from cyanide baths</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/30 . . of tin</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/32 . . characterised by the organic bath constituents used</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/34 . . of lead</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/36 . . characterised by the organic bath constituents used</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/38 . . of copper</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/40 . . from cyanide baths {, e.g. with Cu+}</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/42 . . of light metals</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/44 . . Aluminium</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/46 . . of silver</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/48 . . of gold</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/50 . . of platinum group metals</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/52 . . characterised by the organic bath constituents used</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/56 . . of alloys</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/562 . . {containing more than 50% by weight of iron or nickel or cobalt}</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/565 . . {containing more than 50% by weight of zinc}</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/567 . . {containing more than 50% by weight of platinum group metals}</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/58 . . containing more than 50% by weight of copper</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/60 . . containing more than 50% by weight of tin</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/62 . . containing more than 50% by weight of gold</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/64 . . containing more than 50% by weight of silver</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/66 . . from melts</td>
</tr>
<tr>
<td>1/22 . . Separating compounds</td>
<td>3/665 . . {from ionic liquids}</td>
</tr>
</tbody>
</table>
Electroplating characterised by the process; Pretreatment or after-treatment of workpieces

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

5/003 . [Electroplating using gases, e.g. pressure influence]

5/006 . [Electroplating with applied electromagnetic field, not locally, e.g. for plating magnetic layers] *(Frozen)*

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

5/007 . [Electroplating using magnetic fields, e.g. magnets]

**WARNING**

Group C25D 5/007 is incomplete pending reclassification of documents from group C25D 5/006.

Groups C25D 5/006 and C25D 5/007 should be considered in order to perform a complete search.

5/009 . . [Deposition of ferromagnetic material]

**WARNING**

Group C25D 5/009 is incomplete pending reclassification of documents from group C25D 5/006.

Groups C25D 5/006 and C25D 5/009 should be considered in order to perform a complete search.

5/011 . [Electroplating using electromagnetic wave irradiation (using locally applied electromagnetic radiation C25D 5/024)]

**WARNING**

Group C25D 5/011 is incomplete pending reclassification of documents from group C25D 5/006.

Groups C25D 5/006 and C25D 5/011 should be considered in order to perform a complete search.

5/013 . . [Wavelengths other than ultra-violet [UV], visible or infra-red [IR], e.g. X-rays or microwaves]

**WARNING**

Group C25D 5/013 is incomplete pending reclassification of documents from group C25D 5/006.

Groups C25D 5/006 and C25D 5/013 should be considered in order to perform a complete search.

5/02 . Electroplating of selected surface areas

5/022 . . [using masking means]

**WARNING**

Group C25D 5/022 is incomplete pending reclassification of documents from group C25D 11/022.

Groups C25D 11/022 and C25D 5/022 should be considered in order to perform a complete search.

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

5/08 . Electroplating with moving electrolyte e.g. jet electrolyzing (using locally applied jets of electrolyte C25D 5/026)]

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

5/10 . Electroplating with more than one layer of the same or of different metals (for bearings C25D 7/10)

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.
at least one layer being of nickel or chromium

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

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

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

Electroplating with layers of varying thickness

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

Electroplating using modulated, pulsed or reversing current

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

Electroplating using ultrasonics [, vibrations]

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

Electroplating combined with mechanical treatment during the deposition

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

. . . Pretreatment of metallic surfaces to be electroplated

5/34 . 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 of non-metallic surfaces (C25D 7/12 takes precedence)

**WARNING**

Group C25D 5/54 is impacted by reclassification into group C25D 5/56.

Groups C25D 5/54 and C25D 5/56 should be considered in order to perform a complete search.

5/56 . of plastics

**WARNING**

Group C25D 5/56 is incomplete pending reclassification of documents from group C25D 5/54.

Groups C25D 5/54 and C25D 5/56 should be considered in order to perform a complete search.

5/60 . [Electroplating characterised by the structure or texture of the layers]

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.
5/605. . . [Surface topography of the layers, e.g. rough, dendritic or nodular layers]

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

5/611. . . [Smooth layers]

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

5/615. . . [Microstructure of the layers, e.g. mixed structure]

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

5/617. . . [Crystalline layers]

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

5/619. . . [Amorphous layers]

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

5/623. . . [Porosity of the layers]

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

5/625. . . [Discontinuous layers, e.g. microcracked layers]

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

5/627. . . [Electroplating characterised by the visual appearance of the layers, e.g. colour, brightness or mat appearance]

**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

5/67. . . [Electroplating to repair workpiece]

**WARNING**

Group C25D 5/67 is incomplete pending reclassification of documents from group C25D 5/00. Groups C25D 5/00 and C25D 5/67 should be considered in order to perform a complete search.

7/00 Electroplating characterised by the article coated

**WARNING**

Group C25D 7/00 is impacted by reclassification into group C25D 7/005.

Groups C25D 7/00 and C25D 7/005 should be considered in order to perform a complete search.

7/001. . . [Magnets]

7/003. . . [Threaded pieces, e.g. bolts or nuts]
7/005  .  [Jewels; Clockworks; Coins]

WARNING
Group C25D 7/005 is incomplete pending reclassification of documents from group C25D 7/00.

Groups C25D 7/00 and C25D 7/005 should be considered in order to perform a complete search.

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

WARNING
Group C25D 7/12 is impacted by reclassification into groups C25D 7/123 and C25D 7/126.

Groups C25D 7/12, C25D 7/123, and C25D 7/126 should be considered in order to perform a complete search.

7/123 .  [Semiconductors first coated with a seed layer or a conductive layer]

WARNING
Group C25D 7/123 is incomplete pending reclassification of documents from group C25D 7/12.

Groups C25D 7/12 and C25D 7/123 should be considered in order to perform a complete search.

7/126 .  [for solar cells]

WARNING
Group C25D 7/126 is incomplete pending reclassification of documents from group C25D 7/12.

Groups C25D 7/12 and C25D 7/126 should be considered in order to perform a complete search.

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

11/00 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)]
11/02   .  Anodisation
11/022  .  [Anodisation on selected surface areas]

WARNING
Group C25D 11/022 is impacted by reclassification into group C25D 5/022.

Groups C25D 11/022 and C25D 5/022 should be considered in order to perform a complete search.

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
11/36   .  Phosphatising
11/38   .  Chromatising

13/00 Electrophoretic coating characterised by the process (C25D 15/00 takes precedence; compositions for electrophoretic coating C09D 5/44)
13/02   .  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 5/4476)}
13/10   .  characterised by the additives used { (not used, see C09D 5/4488)}
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
C25D

13/22 . Servicing or operating [apparatus or multistep processes]

13/24 . . Regeneration of process liquids

WARNING

Group C25D 13/24 is impacted by reclassification into groups C25D 21/16, C25D 21/18, C25D 21/20, and C25D 21/22.

All groups listed in this Warning should be considered in order to perform a complete search.

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

21/02 . Heating or cooling

21/04 . Removal of gases or vapours [; Gas or pressure control]

21/06 . Filtering [particles other than ions (filtering ions C25D 21/22)]

21/08 . Rinse

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 liquids

WARNING

Groups C25D 21/16 - C25D 21/22 are incomplete pending reclassification of documents from group C25D 13/24.

All groups listed in this Warning should be considered in order to perform a complete search.

21/18 . . of electrolytes (C25D 21/22 takes precedence)

21/20 . . of rinse-solutions (C25D 21/22 takes precedence)

21/22 . . by ion-exchange