

# CPC COOPERATIVE PATENT CLASSIFICATION

## C CHEMISTRY; METALLURGY

(NOTES omitted)

### METALLURGY

#### C23 COATING METALLIC MATERIAL; COATING MATERIAL WITH METALLIC MATERIAL; CHEMICAL SURFACE TREATMENT; DIFFUSION TREATMENT OF METALLIC MATERIAL; COATING BY VACUUM EVAPORATION, BY SPUTTERING, BY ION IMPLANTATION OR BY CHEMICAL VAPOUR DEPOSITION, IN GENERAL; INHIBITING CORROSION OF METALLIC MATERIAL OR INCRUSTATION IN GENERAL

(NOTES omitted)

#### C23F NON-MECHANICAL REMOVAL OF METALLIC MATERIAL FROM SURFACE (working metal by laser beams [B23K 26/00](#); desurfacing by applying flames [B23K 7/00](#); working of metal by electro-erosion [B23H](#); producing decorative effects by removing surface material, e.g. by engraving, by etching, [B44C 1/22](#); electrolytic etching or polishing [C25F](#)); INHIBITING CORROSION OF METALLIC MATERIAL OR INCRUSTATION IN GENERAL; MULTI-STEP PROCESSES FOR SURFACE TREATMENT OF METALLIC MATERIAL INVOLVING AT LEAST ONE PROCESS PROVIDED FOR IN CLASS [C23](#) AND AT LEAST ONE PROCESS COVERED BY SUBCLASS [C21D](#) OR [C22F](#) OR CLASS [C25](#)

##### NOTES

1. protective layers or coating compositions or methods of applying them; these are classified in the appropriate places, e.g. [B05](#), [B44](#), [C09D](#), [C23C](#).
2. mechanical devices or constructional features of particular articles for inhibiting incrustation; these are classified in the appropriate places, e.g. in pipes or pipe fittings [F16L 58/00](#).
3. articles characterised by being made of materials selected for their properties of resistance to corrosion or incrustation; these are classified in the appropriate places, e.g. turbine blades [F01D 5/28](#).

##### WARNINGS

1. The following IPC group is not in the CPC scheme. The subject matter for this IPC group is classified in the following CPC groups:  
[C23F 1/24](#) covered by [C09K 13/00](#), [H01L 21/00](#)
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.

<b>1/00</b>	<b>Etching metallic material by chemical means</b> (manufacture of printing surfaces <a href="#">B41C</a> ; manufacture of printed circuits <a href="#">H05K</a> )	1/26	. . . . for etching refractory metals
		1/28	. . . . for etching iron group metals
		1/30	. . . . for etching other metallic material
1/02	. Local etching	1/32	. . . Alkaline compositions ( <a href="#">C23F 1/42</a> takes precedence)
1/04	. . Chemical milling		
1/06	. Sharpening files	1/34	. . . . for etching copper or alloys thereof
1/08	. Apparatus, e.g. for photomechanical printing surfaces (photo- mechanical reproduction <a href="#">G03F</a> )	1/36	. . . . for etching aluminium or alloys thereof
1/10	. Etching compositions ( <a href="#">C23F 1/44</a> takes precedence)	1/38	. . . . for etching refractory metals
1/12	. . Gaseous compositions	1/40	. . . . for etching other metallic material
1/14	. . Aqueous compositions	1/42	. . . containing a dispersed water-immiscible liquid
1/16	. . . Acidic compositions ( <a href="#">C23F 1/42</a> takes precedence)	1/44	. Compositions for etching metallic material from a metallic material substrate of different composition
1/18	. . . . for etching copper or alloys thereof	1/46	. Regeneration of etching compositions
1/20	. . . . for etching aluminium or alloys thereof	<b>3/00</b>	<b>Brightening metals by chemical means</b>
1/22	. . . . for etching magnesium or alloys thereof	3/02	. Light metals
		3/03	. . with acidic solutions

3/04	. Heavy metals	11/184	. . . {Phosphorous, arsenic, antimony or bismuth containing compounds}
3/06	. . with acidic solutions	11/185	. . . {Refractory metal-containing compounds}
<b>4/00</b>	<b>Processes for removing metallic material from surfaces, not provided for in group <a href="#">C23F 1/00</a> or <a href="#">C23F 3/00</a></b>	11/187	. . . {Mixtures of inorganic inhibitors}
4/02	. by evaporation	11/188	. . . . {containing phosphates}
4/04	. by physical dissolution	<b>13/00</b>	<b>Inhibiting corrosion of metals by anodic or cathodic protection</b>
<b>11/00</b>	<b>Inhibiting corrosion of metallic material by applying inhibitors to the surface in danger of corrosion or adding them to the corrosive agent (adding inhibitors to mineral oil, fuels, or lubricants <a href="#">C10</a>; adding inhibitors to pickling solutions <a href="#">C23G</a>)</b>	13/005	. {Anodic protection}
11/02	. in air or gases by adding vapour phase inhibitors	13/02	. cathodic; Selection of conditions, parameters or procedures for cathodic protection, e.g. of electrical conditions
11/04	. in markedly acid liquids	13/04	. . Controlling or regulating desired parameters
11/06	. in markedly alkaline liquids	13/06	. . Constructional parts, or assemblies of cathodic-protection apparatus
11/08	. in other liquids	13/08	. . . Electrodes specially adapted for inhibiting corrosion by cathodic protection; Manufacture thereof; Conducting electric current thereto
11/10	. . using organic inhibitors	13/10	. . . . Electrodes characterised by the structure ( <a href="#">C23F 13/16</a> takes precedence)
<b>NOTES</b>		13/12	. . . . Electrodes characterised by the material ( <a href="#">C23F 13/16</a> takes precedence)
1. A compound is classified in the last appropriate place.		13/14	. . . . . Material for sacrificial anodes
2. Esters or anhydrides of organic acids are classified as the relevant acid unless otherwise indicated. Salts of a compound with an inorganic compound are classified as that compound unless specifically provided for.		13/16	. . . . Electrodes characterised by the combination of the structure and the material
11/12	. . . Oxygen-containing compounds	13/18	. . . . Means for supporting electrodes
11/122	. . . . {Alcohols; Aldehydes; Ketones}	13/20	. . . . Conducting electric current to electrodes
11/124	. . . . {Carboxylic acids}	13/22	. . . . Monitoring arrangements therefor
11/126	. . . . . {Aliphatic acids}	<b>14/00</b>	<b>Inhibiting incrustation in apparatus for heating liquids for physical or chemical purposes (adding scale preventives or removers to water <a href="#">C02F 5/00</a> (; inhibiting incrustation in polymerisation reactors <a href="#">C23F 15/005</a>))</b>
11/128	. . . . {Esters of carboxylic acids}	14/02	. by chemical means
11/14	. . . Nitrogen-containing compounds	<b>15/00</b>	<b>Other methods of preventing corrosion or incrustation</b>
11/141	. . . . {Amines; Quaternary ammonium compounds}	15/005	. {Inhibiting incrustation}
11/142	. . . . . {Hydroxy amines}	<b>17/00</b>	<b>Multi-step processes for surface treatment of metallic material involving at least one process provided for in class <a href="#">C23</a> and at least one process covered by subclass <a href="#">C21D</a> or <a href="#">C22F</a> or class <a href="#">C25</a> (coating for obtaining at least two superposed coatings either by methods not provided for in a single one of main groups <a href="#">C23C 2/00</a> - <a href="#">C23C 26/00</a>, or by combinations of methods provided for in subclasses <a href="#">C23C</a> and <a href="#">C25D</a>, <a href="#">C23C 28/00</a>)</b>
11/143	. . . . . {Salts of amines}	<b>2201/00</b>	<b>Type of materials to be protected by cathodic protection</b>
11/144	. . . . {Aminocarboxylic acids}	2201/02	. Concrete, e.g. reinforced
11/145	. . . . {Amides; N-substituted amides}	<b>2213/00</b>	<b>Aspects of inhibiting corrosion of metals by anodic or cathodic protection</b>
11/146	. . . . {containing a multiple nitrogen-to-carbon bond}	2213/10	. Controlling or regulating parameters
11/147	. . . . {containing a nitrogen-to-oxygen bond}	2213/11	. . for structures subject to stray currents
11/148	. . . . {containing a nitrogen-to-nitrogen bond}	2213/20	. Constructional parts or assemblies of the anodic or cathodic protection apparatus
11/149	. . . . {Heterocyclic compounds containing nitrogen as hetero atom}	2213/21	. . combining at least two types of anodic or cathodic protection
11/16	. . . Sulfur-containing compounds	2213/22	. . characterized by the ionic conductor, e.g. humectant, hydratant or backfill
11/161	. . . . {Mercaptans}	2213/30	. Anodic or cathodic protection specially adapted for a specific object
11/162	. . . . {Thioaldehydes; Thioketones}		
11/163	. . . . {Sulfonic acids}		
11/164	. . . . {containing a -SO <sub>2</sub> -N group}		
11/165	. . . . {Heterocyclic compounds containing sulfur as hetero atom}		
11/167	. . . Phosphorus-containing compounds		
11/1673	. . . . {Esters of phosphoric or thiophosphoric acids}		
11/1676	. . . . {Phosphonic acids}		
11/173	. . . Macromolecular compounds		
11/18	. . using inorganic inhibitors		
11/181	. . . {Nitrogen containing compounds}		
11/182	. . . {Sulfur, boron or silicon containing compounds}		

## C23F

- 2213/31 . . Immersed structures, e.g. submarine structures
- 2213/32 . . Pipes