

CPC COOPERATIVE PATENT CLASSIFICATION

C CHEMISTRY; METALLURGY

(NOTES omitted)

METALLURGY

C23 COATING METALLIC MATERIAL; COATING MATERIAL WITH METALLIC MATERIAL (by metallising textiles [D06M 11/83](#); decorating textiles by locally metallising [D06Q 1/04](#)); **CHEMICAL SURFACE TREATMENT; DIFFUSION TREATMENT OF METALLIC MATERIAL; COATING BY VACUUM EVAPORATION, BY SPUTTERING, BY ION IMPLANTATION OR BY CHEMICAL VAPOUR DEPOSITION, IN GENERAL** (for specific applications, see the relevant places, e.g. for manufacturing resistors [H01C 17/06](#)); **INHIBITING CORROSION OF METALLIC MATERIAL OR INCRUSTATION IN GENERAL** (treating metal surfaces or coating of metals by electrolysis or electrophoresis [C25D](#), [C25F](#))

(NOTE 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 groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
[C23F 1/24](#) covered by
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	Etching metallic material by chemical means (manufacture of printing surfaces B41C ; manufacture of printed circuits H05K)	1/18	. . . . for etching copper or alloys thereof
		1/20	. . . . for etching aluminium or alloys thereof
		1/22	. . . . for etching magnesium or alloys thereof
1/02	. Local etching	1/26	. . . . for etching refractory metals
1/04	. . Chemical milling	1/28	. . . . for etching iron group metals
1/06	. Sharpening files	1/30	. . . . for etching other metallic material
1/08	. Apparatus, e.g. for photomechanical printing surfaces (photo- mechanical reproduction G03F)	1/32	. . . Alkaline compositions (C23F 1/42 takes precedence)
1/10	. Etching compositions (C23F 1/44 takes precedence)	1/34	. . . . for etching copper or alloys thereof
1/12	. . Gaseous compositions	1/36	. . . . for etching aluminium or alloys thereof
1/14	. . Aqueous compositions	1/38	. . . . for etching refractory metals
1/16	. . . Acidic compositions (C23F 1/42 takes precedence)	1/40	. . . . for etching other metallic material

- 1/42 . . . containing a dispersed water-immiscible liquid
- 1/44 . Compositions for etching metallic material from a metallic material substrate of different composition
- 1/46 . Regeneration of etching compositions

3/00 Brightening metals by chemical means

- 3/02 . Light metals
- 3/03 . . with acidic solutions
- 3/04 . Heavy metals
- 3/06 . . with acidic solutions

4/00 Processes for removing metallic material from surfaces, not provided for in group [C23F 1/00](#) or [C23F 3/00](#)

- 4/02 . by evaporation
- 4/04 . by physical dissolution

11/00 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 [C10](#); adding inhibitors to pickling solutions [C23G](#))

- 11/02 . in air or gases by adding vapour phase inhibitors
- 11/04 . in markedly acid liquids
- 11/06 . in markedly alkaline liquids
- 11/08 . in other liquids
- 11/10 . . using organic inhibitors

NOTES

1. A compound is classified in the last appropriate place.
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.

- 11/12 . . . Oxygen-containing compounds
- 11/122 {Alcohols; Aldehydes; Ketones}
- 11/124 {Carboxylic acids}
- 11/126 {Aliphatic acids}
- 11/128 {Esters of carboxylic acids}
- 11/14 . . . Nitrogen-containing compounds
- 11/141 {Amines; Quaternary ammonium compounds}
- 11/142 {Hydroxy amines}
- 11/143 {Salts of amines}
- 11/144 {Aminocarboxylic acids}
- 11/145 {Amides; N-substituted amides}
- 11/146 {containing a multiple nitrogen-to-carbon bond}
- 11/147 {containing a nitrogen-to-oxygen bond}
- 11/148 {containing a nitrogen-to-nitrogen bond}
- 11/149 {Heterocyclic compounds containing nitrogen as hetero atom}
- 11/16 . . . Sulfur-containing compounds
- 11/161 {Mercaptans}
- 11/162 {Thioaldehydes; Thioketones}
- 11/163 {Sulfonic acids}
- 11/164 {containing a -SO₂-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}
- 11/184 . . . {Phosphorous, arsenic, antimony or bismuth containing compounds}
- 11/185 . . . {Refractory metal-containing compounds}
- 11/187 . . . {Mixtures of inorganic inhibitors}
- 11/188 {containing phosphates}

13/00 Inhibiting corrosion of metals by anodic or cathodic protection

- 13/005 . {Anodic protection}
- 13/02 . cathodic; Selection of conditions, parameters or procedures for cathodic protection, e.g. of electrical conditions
- 13/04 . . Controlling or regulating desired parameters
- 13/06 . . Constructional parts, or assemblies of cathodic-protection apparatus
- 13/08 . . . Electrodes specially adapted for inhibiting corrosion by cathodic protection; Manufacture thereof; Conducting electric current thereto
- 13/10 Electrodes characterised by the structure ([C23F 13/16](#) takes precedence)
- 13/12 Electrodes characterised by the material ([C23F 13/16](#) takes precedence)
- 13/14 Material for sacrificial anodes
- 13/16 Electrodes characterised by the combination of the structure and the material
- 13/18 Means for supporting electrodes
- 13/20 Conducting electric current to electrodes
- 13/22 Monitoring arrangements therefor

14/00 Inhibiting incrustation in apparatus for heating liquids for physical or chemical purposes (adding scale preventives or removers to water [C02F 5/00](#) (; inhibiting incrustation in polymerisation reactors [C23F 15/005](#)))

- 14/02 . by chemical means

15/00 Other methods of preventing corrosion or incrustation

- 15/005 . {Inhibiting incrustation}

17/00 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](#) ([C23C 28/00](#) takes precedence)

2201/00 Type of materials to be protected by cathodic protection

- 2201/02 . Concrete, e.g. reinforced

2213/00 Aspects of inhibiting corrosion of metals by anodic or cathodic protection

- 2213/10 . Controlling or regulating parameters
- 2213/11 . . for structures subject to stray currents
- 2213/20 . Constructional parts or assemblies of the anodic or cathodic protection apparatus
- 2213/21 . . combining at least two types of anodic or cathodic protection
- 2213/22 . . characterized by the ionic conductor, e.g. humectant, hydratant or backfill

C23F

- 2213/30 . Anodic or cathodic protection specially adapted for a specific object
- 2213/31 . . Immersed structures, e.g. submarine structures
- 2213/32 . . Pipes