

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](#).

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

[C23F 1/24](#)

covered by

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

3/00	Brightening metals by chemical means	11/182	. . . {Sulfur, boron or silicon containing compounds}
3/02	. Light metals	11/184	. . . {Phosphorous, arsenic, antimony or bismuth containing compounds}
3/03	. . with acidic solutions	11/185	. . . {Refractory metal-containing compounds}
3/04	. Heavy metals	11/187	. . . {Mixtures of inorganic inhibitors}
3/06	. . with acidic solutions	11/188	. . . . {containing phosphates}
4/00	Processes for removing metallic material from surfaces, not provided for in group C23F 1/00 or C23F 3/00	13/00	Inhibiting corrosion of metals by anodic or cathodic protection
4/02	. by evaporation	13/005	. {Anodic protection}
4/04	. by physical dissolution	13/02	. cathodic; Selection of conditions, parameters or procedures for cathodic protection, e.g. of electrical conditions
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)	13/04	. . Controlling or regulating desired parameters
11/02	. in air or gases by adding vapour phase inhibitors	13/06	. . Constructional parts, or assemblies of cathodic-protection apparatus
11/04	. in markedly acid liquids	13/08	. . . Electrodes specially adapted for inhibiting corrosion by cathodic protection; Manufacture thereof; Conducting electric current thereto
11/06	. in markedly alkaline liquids	13/10	. . . . Electrodes characterised by the structure (C23F 13/16 takes precedence)
11/08	. in other liquids	13/12	. . . . Electrodes characterised by the material (C23F 13/16 takes precedence)
11/10	. . using organic inhibitors	13/14	. . . . . Material for sacrificial anodes
	NOTES	13/16	. . . . Electrodes characterised by the combination of the structure and the material
	1. A compound is classified in the last appropriate place.	13/18	. . . . Means for supporting electrodes
	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.	13/20	. . . . Conducting electric current to electrodes
		13/22	. . . . Monitoring arrangements therefor
11/12	. . . Oxygen-containing compounds	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))
11/122	. . . . {Alcohols; Aldehydes; Ketones}	14/02	. by chemical means
11/124	. . . . {Carboxylic acids}	15/00	Other methods of preventing corrosion or incrustation
11/126	. . . . . {Aliphatic acids}	15/005	. {Inhibiting incrustation}
11/128	. . . . {Esters of carboxylic acids}	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)
11/14	. . . Nitrogen-containing compounds	2201/00	Type of materials to be protected by cathodic protection
11/141	. . . . {Amines; Quaternary ammonium compounds}	2201/02	. Concrete, e.g. reinforced
11/142	. . . . . {Hydroxy amines}	2213/00	Aspects of inhibiting corrosion of metals by anodic or cathodic protection
11/143	. . . . . {Salts of amines}	2213/10	. Controlling or regulating parameters
11/144	. . . . . {Aminocarboxylic acids}	2213/11	. . for structures subject to stray currents
11/145	. . . . {Amides; N-substituted amides}	2213/20	. Constructional parts or assemblies of the anodic or cathodic protection apparatus
11/146	. . . . {containing a multiple nitrogen-to-carbon bond}	2213/21	. . combining at least two types of anodic or cathodic protection
11/147	. . . . {containing a nitrogen-to-oxygen bond}	2213/22	. . characterized by the ionic conductor, e.g. humectant, hydratant or backfill
11/148	. . . . {containing a nitrogen-to-nitrogen bond}	2213/30	. Anodic or cathodic protection specially adapted for a specific object
11/149	. . . . {Heterocyclic compounds containing nitrogen as hetero atom}	2213/31	. . Immersed structures, e.g. submarine structures
11/16	. . . Sulfur-containing compounds	2213/32	. . Pipes
11/161	. . . . {Mercaptans}		
11/162	. . . . {Thioaldehydes; Thioketones}		
11/163	. . . . {Sulfonic acids}		
11/164	. . . . {containing a -SO ₂ -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}		