Patented Mar. 6, 1934

1,949,713

UNITED STATES PATENT OFFICE

1,949,713

MATERIAL FOR PREPARING METAL SURFACES FOR PAINTING AND THE LIKE

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No Drawing. Application April 5, 1932, Serial No. 603,455

5 Claims. (Cl. 148—8)

This invention relates to the art of preparing metallic surfaces for subsequent coating operations such, for example, as painting, and it has particular reference to the provision of an improved material for the purpose specified.

As is well known in the art, it is customary to prepare metallic surfaces for a painting operation by applying thereto various solutions which are adapted to dissolve and loosen extraneous matter such as rust or oil and then to remove the resultant residue by wiping or washing. Solutions of the kind described are made up by the manufacturer in condition for immediate use. In other words, because of the character of the solutions heretofore known to the art, it has been impossible for the user to buy them in concentrated form and subsequently to dilute them at the time of use. This has necessitated the shipment of the materials in rather bulky form with correspondingly high freight charges.

With the foregoing in mind, the principal object of my invention may be said to reside in the provision of a material of the character described which can be prepared by the manufacturer in a concentrated condition and subsequently diluted by the user. Other objects of the invention relate to the provision of a material which is more effective in removing extraneous matter from the surface of the metal; to increase the coverage of such a material per unit volume; to produce a material which may subsequently be removed from the metal with greater ease; to produce a material which leaves the treated surface in a cleaner condition, better suited for receiving the subsequent coating; to reduce the cost of transporting materials of this nature, and in general to improve the art of preparing metallic surfaces for painting or similar operation.

More specifically stated, my invention has for its object the provision of a dilutible, consolute liquid admixture comprising a metal etching acid and a wetting agent that is compatible with aqueous solutions of either acid or alkali. By "consolute" I mean a clear solution as opposed to a cloudy solution—a uniform solution instead of several layers or phases—a solution which does not separate on standing.

Before discussing the invention in greater detail it is desired to point out that materials for preparing metal for painting are generally composed of two parts, (one) the metal etching agent (the acid), and (two) the oil solvent or disburser otherwise known as the wetting agent.

The acids used must not produce deleterious results and are preferably limited to the tri-hydric mineral acids such as phosphoric and arsenic, but certain organic acids, such as oxalic, tartaric and citric, may also be employed. I prefer to use the tri-hydric mineral acids as they are relatively inexpensive and produce satisfactory results without causing any objectionable after effects.

Phosphoric acid is a very commonly used etching agent and where employed it is customary to use it as strong as it is commercially possible to obtain it. In order to produce a dilutible material in accordance with the present invention it is essential, of course, that much acid be present. I have, therefore, selected a wetting agent of great strength or effectiveness in order to reduce the quantity which it is necessary to mix with the etching agent.

The wetting agents which I prefer and which seem to be best suited for the purpose are those sulphonic acids which have wetting agent characteristics and are compatible with solutions of either acids or alkalis. I have had excellent results by using the sulphonic acid of an aromatic hydrocarbon having an isopropyl radical in its nucleus. The acid radical of such a body is the effective part of the molecule so I may also employ the salts of these acids. Neomerpin is the commercial name of such an acid.

By way of specific example I may produce a concentrated admixture as follows:

	Gallons
Ortho phosphoric acid (75%)	50
Neomerpin	1.50
Water	48.50

The foregoing admixture may be used full strength or water may be added to dilute it to any desired concentration, the commercial limit being about one gallon of the admixture to four gallons of water.

Sulphonic acids suitable for my purpose may not be sufficiently soluble to produce an admixture that is as concentrated as is sometimes desired, and I, therefore, find it advisable to add to my admixture an agent for increasing the solubility of the wetting agent. Alcohols and other solvents acting in many cases like alcohols, such as ketones, ethers, esters, etc. may be employed, and these agents may be used either singly or collectively. By way of specific example of a more concentrated admixture, I may cite the following:—

	Gallons
Ortho phosphoric acid (75%)	70
Ethyl alcohol (which may be denatured)	15
Butyl alcohol	10
Neomerpin	2

The foregoing admixture may be used either full strength or diluted to any concentration up to one gallon of the admixture to about eight gallons of water.

To use my material, either dilute or concentrated, it is applied to the metal to be prepared for coating by dipping, spraying, brushing or swabbing. Sufficient time is then allowed for it to

loosen, dissolve or disperse the extraneous matter which may happen to be present, assisting its action if necessary by scrubbing with an abrasive. The resultant residue is then removed from the metal by wiping with a dry cloth, by blowing off with steam or by washing with water. The metal is then permitted to dry in the air or it may be dried more quickly by placing it in an oven heated to approximately 200° F. The metal is then ready for receiving the desired coating such as paint, enamel, japan or lacquer or chemically treating, to produce various phosphate or other coatings.

The above described sulphonated body is extremely effective in causing my admixture to properly wet the metal, and because its viscosity is so low only very small amounts of it, relatively speaking, are required to cover very large surfaces. For instance it has been found that when either of the formulas above given are diluted with water to contain two gallons of acid per gallon of diluted material, one gallon of the admixture will prepare 1.25 times as much surface as materials heretofore in use, and, in addition, the resulting surface is cleaner and in a better condition for receiving subseqûent coating.

I should like to point out that the invention is particularly useful in preparing fabricated sheet steel automobile bodies.

I claim:—

1. A dilutible consolute liquid admixture for preparing metal for painting comprising tri-hydric mineral acid and a sulphonated aromatic hydrocarbon wetting agent having an iso-propyl radical in its nucleus, the same being compatible with aqueous solutions of either acids or alkalis.

2. A dilutible consolute liquid admixture for preparing metal for painting comprising phosphoric acid and a sulphonated aromatic hydrocarbon wetting agent having an iso-propyl radical in its nucleus.

3. A dilutible consolute liquid admixture for preparing metal for painting comprising phosphoric acid, a sulphonated aromatic hydrocarbon wetting agent having an iso-propyl radical in its nucleus and alcohol.

4. A dilutible consolute liquid admixture for preparing metal for painting comprising phosphoric acid, a sulphonated aromatic hydrocarbon wetting agent having an iso-propyl radical in its nucleus and ethyl alcohol.

5. A dilutible consolute liquid admixture for preparing metal for painting comprising phosphoric acid, a sulphonated aromatic hydrocarbon wetting agent having an iso-propyl radical in its nucleus, ethyl alcohol and butyl alcohol.

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