

UNITED STATES PATENT OFFICE

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MATERIAL FOR AND PROCESS OF COATING METAL

No Drawing.

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This invention relates to the art of coating metal and is particularly directed to preventing corrosion and enhancing the appearance of sheet steel such as is used for automobile fenders and the like.

Before metal is coated with paint-like coverings, it has been the practice to first thoroughly clean the said metal to remove all traces of rust and other extraneous matter such as hand marks, acid runs, oil, etc., as experience has shown that such materials soon cause the development of defects in the final finish. But even when this is done, failures still occur.

The objects of this invention are to provide a coating where less care has to be exercised to rid the metal of this extraneous matter; to provide a coating of longer life; to reduce the number of operations necessary to properly finish metal; to reduce the cost of coating metal and to generally improve the art of preventing metal from corroding.

I have discovered that if a metal etching acid is added to the waterproof material used for coating the metal, a great benefit results, in that the coating holds much better to the metal and hence acts as a better protector. As simple mechanical mixtures of the acid and the waterproof-coating material do not always seem to produce uniform results, it is necessary to properly design the coating material so that the said acid is actually dissolved and held in solution by the water-proof coating material itself.

To do this I provide an admixture comprising a solvent, a water-proof material soluble in the said solvent and a metal etching acid soluble in the water-proof material but not soluble in the said solvent. By dissolving the acid in the water-proof material and not in the solvent it is evident that the acid remains uniformly distributed in the resultant coating after the solvent has evaporated, thus producing a new type of coating comprising a consolute solution of a water-proof material and a metal etching acid.

The solvent used in my admixture may be any suitable hydrocarbon capable of dissolving the water-proof material selected, such hydrocarbons as benzole, naphtha, petroleum

spirits or kerosene. I prefer an admixture of what is known in the trade as solvent naphtha, coal tar solvent, or industrial xylol, and kerosene.

The water-proof material may be any suitable material soluble in the solvent and capable of dissolving a metal etching acid; certain resins, fatty acids, tars and pitches have this property. It is especially marked in the case of stearine pitch and I prefer to use it in my practical material.

The acid selected should be soluble in the water-proof material but not soluble in the solvent used. The best results are obtained with orthophosphoric acid. This is soluble in the pitch, but it is insoluble in the solvent used for dissolving the pitch. I find there is an advantage in drying my coating at a temperature sufficiently high to decompose the phosphoric acid into the pyro or the meta acid and thus make it less liable to be leached out of the resultant coating by exposure to water. As it is safe to dry my coating at a temperature of 232° centigrade and as orthophosphoric acid decomposes below that temperature its use in my coating has this advantage.

With these considerations in mind a suitable coating material may be made by admixing:

Stearine pitch	232 pounds
Solvent naphtha	41 gallons
Kerosene	29 gallons
Orthophosphoric acid (100%)	10 pounds

The pitch is dissolved in the admixture of the naphtha and kerosene and the acid made liquid by heating, added slowly while stirring.

The material thus produced has properties similar to a varnish and for certain uses may, on drying on the metal, be too transparent or too smooth. The cellulose lacquers for instance, will not adhere properly to such a smooth surface and when these finishes are to be applied over my coating, it is well to add a filler to the above material that tends to give a "tooth" to my coating and thus offer points of attachment for the lacquer. Fillers such as asbestine, titanium oxide, barium sulphate,

clay or silica may be employed for this purpose; that form of silica known as fossil meal produces very satisfactory results. About 225 pounds of this added to the above admixture gives sufficient roughness for securing a tight coating of cellulose lacquer.

Where it is desired to give my coating more hiding powers or when a colored coating is wanted, various pigments may be used as the filler. Chrome green oxide gives my coating a green color and lamp-black may be used for deepening its tone and increasing its opacity. For instance, 15 pounds of lamp-black added to the formula I have given above produces a coating of good hiding powers and of deep black appearance, making my coating more suitable for automobile fenders and the like.

The metal to be coated with my material should first be freed from extraneous matter, such as heavy coatings of oil, grease, rust and chemicals. The metal is then washed in hot water, to reduce what may be left on the metal to a thin film. The metal is then dried; after which it is ready to receive my coating. The coating is best applied by dipping although it may be applied by brushing or spraying if desired. The coated metal is then allowed to drain for ten minutes, more or less, and then placed in an oven heated to approximately 232° centigrade where it is allowed to remain for about a half an hour. On removing it from the oven, it will be found that the coating has become hard and dry yet possessing a ductility which enables it to stand much bending and drawing.

Both salt spray and the humidity cabinet tests indicate the superiority of my coating over that of the prior art in that the life of my finish is longer and corrosion occurring where the finish is scratched through to the metal, confines itself to the scratched portion and does not extend further and further under the finish as time goes on, as would be the case where the usual finish is used. As my coating has superior powers to resist corrosion, it is not necessary to use as many coats to get the desired weather proofing effect where my coating is used as the priming coat; one coat of my material and one top coat often offers more protection against the weather than three or more coats of the materials used prior to my invention.

I claim:

1. A material for coating metal, being an admixture comprising kerosene, stearine pitch and orthophosphoric acid.

2. A material for coating metal, being an admixture comprising kerosene, stearine pitch, orthophosphoric acid and lamp-black.

3. A material for coating metal being an admixture comprising waterproof material and tri-hydric anhydrous metal etching acid, said material and acid being in solution with respect to each other, and said admixture also

comprising a volatile thinner in which the first named solution is dissolved and which is incapable of dissolving the acid alone, whereby, when the thinner volatilizes, the acid and material remain mutually dissolved.

4. A material for coating metal being an admixture comprising stearine pitch and tri-hydric anhydrous metal etching acid, said pitch and acid being in solution with respect to each other, and said admixture also comprising a volatile thinner in which the first named solution is dissolved and which is incapable of dissolving the acid alone, whereby when the thinner volatilizes the acid and pitch remain mutually dissolved.

5. A material for coating metal being an admixture comprising waterproof material and orthophosphoric acid, said material and acid being in solution with respect to each other, and said admixture also comprising a volatile thinner in which the first named solution is dissolved and which is incapable of dissolving the acid alone, whereby when the thinner volatilizes, the acid and material remain mutually dissolved.

6. A material for coating metal being an admixture comprising stearine pitch and orthophosphoric acid, said pitch and acid being in solution with respect to each other, and said admixture also comprising a volatile hydrocarbon thinner in which the first named solution is dissolved and which is incapable of dissolving the acid alone, whereby when the thinner volatilizes, the acid and stearine pitch remain mutually dissolved.

7. The process of coating metal with a hard, dry, ductile and adherent coating comprising waterproof material and a metal etching acid uniformly distributed throughout the coating material, which consists in applying to clean metal a fluid admixture comprising waterproof material and tri-hydric anhydrous metal etching acid in solution with respect to each other and also comprising a volatile thinner in which the first named solution is dissolved and which is incapable of dissolving the acid alone, and volatilizing the thinner and drying the mutually dissolved acid and coating material by heating the metal.

8. The process of coating metal with a hard dry ductile and adherent coating comprising waterproof material and metal etching acid uniformly distributed throughout the coating material, which consists in applying to clean metal a fluid admixture comprising stearine pitch and orthophosphoric acid in solution with respect to each other and also comprising a volatile thinner in which the first named solution is dissolved and which is incapable of dissolving the acid alone, and volatilizing the thinner and drying the mutually dissolved acid and pitch by heating the metal.

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