

UNITED STATES PATENT OFFICE.

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METHOD OF PREPARING METALS FOR PAINTING.

No Drawing.

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To all whom it may concern:

Be it known that I, JAMES H. GRAVELL, a citizen of the United States, residing at Elkins Park, in the county of Montgomery and State of Pennsylvania, have invented a certain new and useful Method of Preparing Metals for Painting, of which the following is a specification.

This invention relates to cleaning metal and although the invention may be applied generally, it is especially useful for preparing iron and steel for painting or other finishing operation where the surface should be free from oil and rust and substances which cause rust.

The object of the invention is to provide a process for etching and cleaning a metal surface so that after a paint or other covering is applied the coating will firmly adhere to the metal surface and be free from any tendency to rust or corrode between the metal surface and the applied covering.

Owing to the fact that metal used for fabricating is often oily or greasy due to applied oils for preventing the metal from rusting or from oil and grease accumulated during the fabricating processes, etching and cleaning fluids have not met with success unless mixed with alcohol or its equivalent which will dissolve or remove the oil film so as to bring the active cleaning agent into actual contact with the metal.

The use of alcohol for such purposes is sometimes objectionable due to its cost and also due to its fire risk. I have discovered that alcohol and other volatile solvents may be dispensed with and that satisfactory results can be obtained by combining with the active cleaning agent an emulsifier in an aqueous solution.

Generally stated, my invention consists in combining in a single solution, an acid, an emulsifier and water, and also in applying this admixture to the surface to be cleaned, and removing the resulting products by wiping or washing. The result of the application of my invention is a surface suitable for receiving a covering, such for instance, as a coat of paint.

Although any suitable acid and emulsifier may be selected it is obvious that the two must be compatible. I have found that phosphoric acid and gum arabic in an aqueous solution produces satisfactory results.

I have found a satisfactory composition of ingredients to be: 85% phosphoric acid 1 gallon, water 5 gallons, gum arabic 24 ounces.

This admixture is applied to the metal and when the metal has been sufficiently cleaned it is wiped off with a dry rag or chamois or washed off with water. After the metal has become dry it may be painted. When the metal is covered with a substantial covering of oil or grease it will be found advisable to rub the surface with my admixture so that the oil will be quickly emulsified and then allow the acid to attack the metallic surface.

Experiments have shown that the acid alone will not wet or attach itself to the oily surface except in the presence of the emulsifier but in the presence of the emulsifier the oil on the surface is emulsified and removed from the surface allowing the acid content to actually contact with the metal surface and freeing it from objectionable substances such as rust, scale, acid runs, hand marks, etc.

My invention is especially suited for preparing automobile bodies and other high grade sheet steel work for painting. Such work treated according to my invention and then painted is practically rust proof.

The invention involves the removal of the oil, grease or oleaginous substances from the surface of the metal by emulsifying in water by means of gum, soluble in water, carageen, yolk of egg and the like, in the presence of an acid soluble or miscible in the liquid and adapted to remove and oppose the formation of rust and not to interfere with the described action of the gum or the like. Consequently in some of its broader aspects the invention is not limited to the substances named, but includes their equivalents, nor is the invention limited in all cases to the proportions given.

I claim:

The method of preparing oiled steel for painting which consists in simultaneously chemically etching the surface and emulsifying the oil on the surface, and removing the products of the etching and emulsifying by washing the treated surface of the metal with water.

JAMES H. GRAVELL.