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SOLUTION FOR TREATING METAL SURFACES

Oscar L. Peterson and Harry L. Peterson, Glen Rock, and Clarence E. Peterson, Ridgewood, N. J., assignors to Delaney Chemical Company, a corporation of Pennsylvania

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This invention is a composition for and a method of treating metal and other surfaces so as to cleanse their exposed areas from surface corrosion and other oxides and to effectively remove any form of vegetable oils, mineral oils or animal fats.

One of the objects of the invention is to provide a chemical mixture for treatment of the surfaces of such metals as iron, steel, zinc, and alloys of zinc, chromium and aluminum, or either of them, so as to remove the surface rust, oxides or other forms of coating or corrosion, and thereby leave a clean, exposed area which is passive to corrosion. A further object is to provide a surface of the character mentioned which is free of oxide and other form of corrosion, thereby providing a perfect bond for paint, enamel and lacquer. A further object is to provide a composition which not only acts to remove annealing scale, corrosion and other oxides from metal, but also effectively removes any form of vegetable oil, mineral oil or animal fats which may have been deposited upon the surface being treated, without damage to the cleansed surface, although the cleansing agent may remain upon the surface. A further object is to provide a composition which will effectively cleanse the surfaces of marble, tiles, porcelain, vitreous enamel, etc. and lacquered and enameled wood, of oils and grease, without damage to the surface being treated.

The invention will be hereinafter fully set forth and particularly pointed out in the claims:—

The composition comprises a mixture of sulphonated coal tar distillate added to a mixture of oxalic acid and a metal sulphate, such as sodium sulphate. In preparing the composition, the oxalic acid is first mixed with a metal sulphate, which mixture reacts to produce an oxalate. The sulphonated coal tar distillate is then added to the mixture together with the desired quantity of water, the mixture being thoroughly agitated while the distillate is brought into solution. After the solution is obtained the resultant mixture is filtered to obtain a clear filtrate.

The metal sulphate above referred to is preferably sodium sulphate, but it is to be understood that the invention is not limited thereto, because in the present case sodium sulphate and potassium sulphate are known equivalents. Therefore, wherever either of said sulphates is specified in the claims it is to be understood that the above mentioned equivalents are meant.

Also, any of the sulphonated coal tar distillates may be employed such as mono-, di-, or tri-sulphonic acid of naphthalene or mono-, di-, or tri-sulphonic acid of alpha naphthol. Good results have been obtained with the following approximate proportions by weight:—

8% oxalic acid
10% sodium sulphate
½% sulphonated coal tar distillate
balance water.

The foregoing proportions are given solely for illustrative purposes and without intent to limit the invention thereto, and it is therefore contemplated that said proportions may be varied to suit different conditions without departing from the spirit of the invention.

In practice, the solution may be used full strength or diluted up to five parts of water to one part of the solution. The metal to be treated may be immersed in the solution for a period long enough, as determined by observation, to dissolve and remove the rust, oxides, oils and grease. In some instances a treatment of less than a quarter of a minute is all that is necessary. At the end of the treatment the metal is removed from the bath and may be washed in water, although the washing step is not required. In lieu of immersing, the solution may be sprayed upon the metal to be treated, or applied by means of a cloth or brush, or by any other method.

It is not known at this time just precisely what reaction, physical or chemical, takes place during the treatment above described. It is believed, however, to be suffiicent to state that the rust, oxides, oils and greases are in some way dissolved and disapear and that the solution apparently does not attack the metal. Its action on oils, fats and greases of all kinds appears to be to emulsify rather than to dissolve them in the manner that gasoline, carbon tetra-chloride, naphtha and other similar hydrocarbons dissolve greases. It is not volatile at normal working temperatures, is non-inflammable and non-combustible. After removing oxides, rust, greases and the like the solution has no detrimental action on the metal because it apparently does not attack the metal surface. Apparently it has an affinity solely for the rust and other oxides such as annealing scale, oils, grease and the like.

By omitting the metal sulphate and using only the oxalic acid and the sulphonated coal tar distillate in water, the solution may be used for cleaning marble, tiles, porcelain, vitreous enamel, etc., and enameled and lacquered wood work.

A very important advantage of the invention is that the solution not only removes scale, rust and other corrosive impurities, but it also thoroughly cleanses the surface of all grease-like deposits in such a manner that it is possible to paint or plate upon the cleansed surfaces without washing off or neutralization of the solution unless such washing is desired. One of the important uses of the solution is in connection with the automotive industry. For instance, in the manufacture of car bodies and other metal parts, the hands of the workmen constantly come into contact with the metal surfaces, causing rust spots to appear wherever the bare hands have touched. These corroded spots interfere with the obtaining of a perfect bond with coatings such as paint, lacquer, enamel or the like, and therefore it is very desirable to effect their removal. By treating the surfaces with the mixture above described, the corrosion, oil and grease immediately disappear and the surfaces are prepared without further washing or other treatment to effect a perfect bond with any form of coating which it is desired to apply, although the surfaces may be washed if so desired.

Having thus explained the nature of the invention and described an operative manner of constructing and using the same, although without attempting to set forth all of the forms in which it may be made, or all of the forms of its use, what is claimed is:—

1. A composition for cleansing surfaces comprising a mixture of sodium sulphate with oxalic acid and a sulphonated coal tar distillate.

2. A composition for cleansing surfaces comprising a mixture of sodium oxalate with a sulphonated coal tar distillate.

3. A composition for cleansing surfaces comprising a mixture of sodium oxalate obtained by a reaction of oxalic acid and sodium sulphate, and a sulphonated coal tar distillate.

4. A composition for cleansing surfaces comprising a mixture in the approximate proportions of 8% oxalic acid, 10% sodium sulphate, ½% of 1% sulphonated coal tar distillate and water.

OSCAR L. PETERSON.
HARRY L. PETERSON.
CLARENCE E. PETERSON.