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CLEANING AND RUSTPROOFING COMPOSITION

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1 Claim. (Cl. 106—14)

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This invention relates to rustproofing compositions and particularly to a combined cleaning and rustproofing composition for use in a process for cleaning and rustproofing corrodible metals in a single operation.

In the preparation of metals for the various finishing operations normally necessary, it has long been recognized that a clean surface is necessary for the proper adhesion of the final protective coating such as paint, varnish, enamel or the like. The attaining of such clean surfaces on metal sheet material is made difficult by the fact that a preliminary protective coating of mineral oil or the like is usually applied to sheet metal prior to the time that it is shipped from the steel mills. This is done in order to prevent corrosion which would otherwise occur between the time of the shipment and the time of use. The protective oil film thus applied must be carefully removed prior to the application of the final protective coating since contaminating amounts of oil on the surface will cause chipping or peeling at a later time. Where the sheet metal is not given a protective oil coating, other contaminating elements such as tar, asphalt, wax, inorganic salts, carbon residue, loosely adherent metallic oxides and metal particles may be present on the metal surface and must be removed for the same reason. In any case the problem of preventing corrosion of the metal surface arises as soon as the cleaning operation is started since the original corrosion inhibiting coating or film is removed in the cleaning step.

Various cleaning compositions have been proposed for use on such metals. For instance, a group of compositions have been used for this purpose containing phosphates or phosphoric acid having a chemical etching action on the metal surface. While such compositions have been in use for many years, their field of application has been limited due to a number of factors including a difficulty in application because of the characteristics of phosphoric acid and the relatively high cost due to the necessity of incorporating relatively expensive wetting agents and oil and grease solvents. Moreover, a chemical action such as etching is not always desirable in the cleaning of such metals due to the wide variety of applications which may directly follow the cleaning operation. It has also been observed that many compositions provide some degree of cleaning but do not satisfactorily prevent corrosion or cannot be directly covered by the final protective coating. It is therefore necessary to use a second composition to be applied following

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the completion of the cleaning operation in order to obtain resistance to corrosion or compatibility with the final coating.

Accordingly, it is one object of the present invention to provide a composition having a cleaning and corrosion resistant action in a single application.

A further object of the present invention is to provide a composition which will remove oil, grease and other soil from metallic surfaces and which will simultaneously leave a corrosion resistant film on such surfaces after the cleaning operation has been completed which film may be directly covered with paint, varnish, enamel or the like.

The composition of the present invention is prepared by adding an organic polar active compound comprising a relatively small amount of a fatty acid heavy metal soap to a suitable solvent and then emulsifying the solvent and soap in water by means of a suitable emulsifier. The cleaning operation is carried out primarily by the dispersed solvent. The fatty acid heavy metal soap forms a corrosion resistant film which immediately covers the surface of the metal being cleaned as the solvent removes the protective or contaminating material on the metal surface. I have found that the following types of solvents may be used: petroleum fractions such as kerosene or naphtha, coal tar hydrocarbons such as toluol, high flash naphtha or neutral oil, and chlorinated hydrocarbons such as trichlorethylene. As emulsifying agents I may use soaps, esters of fatty acids, sulfonated oils, petroleum sulfonates or fatty alcohol sulfonates. Finally, as organic polar active compounds of the fatty acid heavy metal soap type I have found that the calcium, cobalt, nickel, lead, zinc or cadmium salts of oleic, naphthenic, lauric, palmitic or linoleic acids are most effective in the formation of anti-corrosion films. These heavy metal soaps, when forming a part of the composition of this invention, have the property of immediately forming a thin protective film over the entire surface of the metal as it is cleaned. This thin film not only imparts corrosion resistant characteristics to the metal surface but also provides a suitable base for the direct application of the final protective coating of paint or the like. In some cases it may be desirable to reduce the amount of residual film prior to applying the final protective coating of paint. This may be accomplished by rinsing with water. Following such a rinse the polar active material remains on the surface and thus gives corrosion protection

but does not interfere with the adhesion of the paint film and therefore need not be removed prior to the application of the final coating.

As a specific illustration of the present invention a preferred example is set forth below, although it will be understood that equivalent compounds may be substituted for those given:

Example

	Grams
Kerosene	80
Triethanolamine oleate	14
Cobalt naphthenate (Technical 6%)	6
Water	5–5000

In the above example the triethanolamine oleate and cobalt naphthenate are added to the kerosene and the resulting mixture is then intimately mixed with the water by stirring. The finished composition is applied to the surface of the metal either by spraying or in open tanks. The protective and corrosion resistant film which forms on the metal surface during the cleaning operation is allowed to remain on the surface or may be rinsed with a diluted mixture or with water and the final protective coat of paint or the like is applied directly over it. It is possible to use the composition of the present invention in diluted form entirely for rustproofing without regard to any particular action as a cleaning composition. This appears to be possible by virtue of the peculiar rustproofing properties of

the polar active compounds when spread in a thin film and allowed to dry.

Having thus described my invention, I claim:

A cleaning and corrosion resistant composition consisting of the following ingredients in substantially the stated proportions:

	Grams
Kerosene	80
Triethanolamine oleate	14
Cobalt naphthenate (Technical 6%)	6
Water	5–5000

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