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## RUST INHIBITING COATING

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The present invention relates to liquid coating compositions and more specifically to that class of materials commonly known as "metal primers".

Priming coatings are generally applied to steel, iron, cast iron or other ferrous metal surfaces for two purposes—(*a*) to prevent corrosion of the surfaces due to atmospheric influences, and generally known as rusting; and, (*b*) to act as a foundation for subsequent coatings applied for decorative effect or as additional protection.

Heretofore in the application of such coatings to ferrous metal surfaces it is the usual and necessary preliminary procedure to remove as much as possible of the rust often present, by scraping, sanding or wire brushing as, if such rust is not almost entirely removed before priming, further rusting or oxidation will occur under the primer film. Such further rusting is due to the presence of moisture either occluded or combined or otherwise contained in the rust or absorbed through the film and will eventually cause the lifting or peeling of the film and destruction of the surface.

Among the objects of the present invention is a liquid coating composition for use as a metal primer and adapted not only to serve as a foundation for subsequent coating but also to prevent rusting.

Another object is a metal primer which efficiently inhibits further oxidation when applied to ferrous metal surfaces from which all of the rust has not previously been removed.

Another object is a metal primer which effectively prevents the progress of rusting under the film of coating material by rendering harmless any moisture present in the rust or absorbed through the film.

Further, it is generally accepted that the dried films of paints, varnishes and similar compositions gradually disintegrate and become porous due to the progressive oxidation and disintegration of the binder material, such increasing porosity in time allowing moisture and air to penetrate the film and attack the metallic surface underneath.

A further object of the invention therefore is to provide in the primer a material or materials which will inhibit or greatly retard rusting, due to this penetration of moisture and air through the partially disintegrated film.

Another object is a priming coating with which subsequent coats of paint or similar material will satisfactorily bond, with freedom from "creeping or crawling" or other imperfections at the time of application and later freedom from checking, cracking, and other failure which may be due to the primer.

It has been discovered that by combining certain oils with certain solvents there may be obtained a composition which has a very low viscosity and possesses to an extreme degree the ability to penetrate into, through, and under rust deposits and that such a composition leaves, when dried, a minimum of residual film on the surface of the metal. The film, further has a semi-flat texture, aiding in better adhesion of subsequent coatings and is quite elastic, thereby minimizing after-brittleness, checking or cracking.

The oils having the desired characteristics for the present purpose are certain oleoresinous drying and semi-drying oils of the glyceride type and of vegetable or animal origin and include linseed oil, China-wood oil, soya bean oil, menhaden oil, and the like, and may or may not be heat treated prior to use. The solvents mentioned are certain hydrocarbon solvents, specifically 44° to 50° B naptha. The degree of penetration may be varied by varying the kinds of oils and solvents or by varying the proportions, it being a general rule that the slower-drying oils, for example, soya bean oil, give a greater penetration.

In order to produce the rust inhibiting properties so desirable, there is added to the oil and solvent mixture a water soluble rust inhibitor preferably by emulsifying in the oily mixture a saturated water solution of chromium trioxide or one or more of its soluble compounds, such as soluble chromates or dichromates, particularly ammonium, sodium, potassium or allied metals or radicals. These soluble rust inhibiting agents being carried into and around any rust present and held by the primer film go into solution in any moisture present and ionize and by exerting a passive effect on the ferrous metal surface markedly inhibit and retard further corrosion.

The preparation of the primer, as indicated above, involves the emulsification of the solution of the inhibitor in the oil-solvent mixture and this is best accomplished through the use of certain emulsifying agents of which triethanolamine is an

example and has been found satisfactory. Other emulsifying agents however may be used.

As a specific example of the preparation of the primer the following constituents and proportions are cited:

| | Pounds |
|---|---|
| China-wood oil | 25 |
| Linseed oil | 25 |
| 49° B naptha | 20 |
| 44° to 46° B naptha | 65 |
| Triethanolamine | 9½ |
| Potassium dichromate | 6 |
| Warm water | 40 |
| Ammonium hydroxide (13° B) | 3 |

Of these constituents, the oils and naptha are first mixed and then is added the triethanolamine. The potassium dichromate is then dissolved in the water and to this solution is added the ammonia. After the solution has been prepared it is added slowly and with vigorous agitation to the mixture of oils, solvent, and emulsifier.

The resulting product is a quite permanent, low viscosity, lemon colored emulsion exhibiting the characteristics above outlined.

It should be noted that the above specific example of proportions of constituents will produce only one of the many compositions useful for rust inhibition and is one which is intended to dry and so permit a further coating or which itself will withstand atmospheric action.

Further, the penetrating effect will be increased or reduced as the lighter or non-drying elements are increased or reduced in proportion to the drying oils. Also, as already indicated, the proportion of the chromate may be reduced if desired, but the rust inhibiting qualities will also be reduced in such cases.

If it is desired, the mixture of oils or the individual oils may be heat treated before use.

Further, the chromic solution may be added either in acid or alkaline solution, but better results are obtained if slightly alkaline solutions are used. And, in producing the desired alkalinity it is preferred to use ammonium hydroxide as this leaves no residual deposit of alkali. However, any soluble alkali such as sodium or potassium hydroxide may be used.

When properly prepared as above indicated, the emulsification of the chromate solution into the oils does not appreciably increase the viscosity of the resulting product nor does it decrease the ability to penetrate into the rust.

Now having described the invention and the preferred embodiment thereof, it is to be understood that said invention is to be limited, not to the specific details herein set forth, but only by the scope of the claims which follow:

What I claim is:

1. As a protective priming coating for rusted surfaces, a drying oil emulsion comprising a drying oil of the glyceride type emulsified in a water solution of a soluble chromate, said drying oil and chromate solution being in substantially equal parts, and a hydrocarbon solvent for said drying oil in an amount at least substantially equal to the amount of said drying oil.

2. As a protective priming coating for rusted surfaces, an emulsion comprising substantially 50 pounds of a drying oil of the glyceride type, substantially 49 pounds of a water solution of a soluble chromate, substantially 9½ pounds of an emulsifying agent and substantially 85 pounds of a hydrocarbon solvent for said drying oil.

3. As a protective priming coating for rusted surfaces, an emulsion comprising the following ingredients and their reaction products in substantially the amounts indicated: China-wood oil, 25 pounds; linseed oil, 25 pounds; 49° B naptha, 20 pounds; 44° to 46° B naptha, 65 pounds; triethanolamine, 9½ pounds; potassium dichromate, 6 pounds; warm water, 40 pounds; and ammonium hydroxide (13° B), 3 pounds.

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