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COMPOSITION AND METHOD FOR REMOVING CORROSION FROM ZINC, ZINC ALLOYS, AND ZINC COATED METALS

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1

This invention relates to the removal of rust and like corrosion reaction products from ferrous and other metals.

One of the objects of this invention is to provide a simple, practical, and efficient means for treating corrosion reaction products that appear on zinc coated ferrous metals as a result of oxidation or other corrosive actions and to substantially restore the surface of the metal or metals to a condition substantially free from such reaction products. Another object is to provide a method and means of the just-mentioned nature that will also contribute a passivating effect in at least the surface portions of the metal and thus enhance its capacity for resisting subsequent corrosion, particularly in the zinc coated ferrous metals. Another object is to provide a method and means for removing corrosion reaction products of the above-mentioned nature that will be capable of practical use in a simple and inexpensive manner and, where desired, without requiring elaborate or complex or costly apparatus or equipment. Another object is to provide a method and means of the above-mentioned nature that may be simply and efficiently carried on both in small shops or establishments, illustratively such as use sheet metals as raw materials for conversion into various products where the need for such treatment may be principally intermittent, and in larger establishments where such need might be continuous. Another object is to provide a means of the above-mentioned nature that will entail little, if any, risk, such as the possibility of permanently injuring the corroded metal, and that will not require a high degree of skill in its control and application. Other objects will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, arrangements of parts, and in the several steps and relation and order of each of said steps to one or more of the others thereof, all as will be illustratively described herein, and the scope of the application of which will be indicated in the following claims.

A very common corrosion reaction product is that found upon zinc or zinc alloys, and particularly on zinc-coated metals such as so-called "galvanized" iron. This corrosion reaction product is usually white or thereabouts in color. Such corroded products I treat by immersion in a bath which comprises two ounces by weight of tartaric acid, two ounces by weight of ammonium chloride, and 0.25 ounces by weight of mercuric

2

chloride, per gallon of water, maintaining the bath preferably at a temperature of about 150° F. The time period of immersion may vary according to the extent or depth or character of the zinc corrosion reaction product, and the immersion may be for as short a time as about one minute or for several hours, including more if the corrosion has extended to such an extent as to form in effect localized pits which form localized regions of corrosion reaction product of greater depth than elsewhere, and hence require a longer time to be acted upon or dissolved by the solution. Such a bath, furthermore, does not attack the base metal and leaves it clear and clean, with an exceedingly light coating of mercury deposited or plated onto or covering the areas from which the corrosion reaction product has been removed by the treatment, if the concentration of the mercury ingredient of the solution is high enough or the time period of immersion long enough, or both. By appropriate variation of these latter factors, particularly in relation to the relative potentials or E. M. F.'s of the metals, a coating of mercury deposit may be avoided entirely or made exceedingly thin (for example, hardly visible or just noticeably visible), or may be achieved in relatively substantial thickness though preferably not sufficiently so as to be relatively fluid on the surface of the metal. At least some degree of mercury coating is preferred, since it has the effect of giving the treated metal surface a reflective appearance or effect without which, apparently because of a slight production of a mercuric or mercurous reaction product at the surface of the metal, it has a matte or lusterless appearance which may be desirable for some purposes and not desirable for others. In the latter case, it can be avoided as above mentioned.

Upon removal from the bath, rinsing in plain water and drying in any suitable way suffice to complete the treatment, whence the metal piece or pieces, now freed and cleansed of the reaction products that comprise the zinc corrosion, may be put to use, coated, or shipped or stored.

It will thus be seen that there has been provided in this invention a means and method for removing corrosion reaction products, in which the various objects above noted, together with many practical advantages, are successfully achieved. The compounds, in solution, are easy, simple, and safe to handle in contrast to strong acids or strongly acidic substances heretofore proposed to be used, and the method will be seen to be simple and capable of being carried on with

3

a minimum of technical skill or supervision. The relative proportions above set forth will be understood to be preferred and illustrative of the best mode of carrying out my invention, and are capable of some latitude of change or variation, all within the spirit and purposes of my invention.

As many possible embodiments may be made of the mechanical features of the above invention and as the art herein described might be varied in various parts, all without departing from the scope of the invention, it is to be understood that all matter herein above set forth is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. A composition for removing corrosion reaction products from zinc, zinc alloys and zinc coated metals comprising by weight per gallon of water:

	Ounces
Tartaric acid.....	2
Ammonium chloride.....	2
Mercuric chloride.....	0.25

2. The method of removing from zinc, zinc

4

alloys and zinc coated materials the effects of oxidation thereof which comprises immersing the metal in a bath comprising per gallon of water 2 ozs. by weight of tartaric acid, 2 ozs. by weight of ammonium chloride, and 0.25 oz. by weight of mercuric chloride, while maintaining the bath at a temperature of about 150° F.

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