

## UNITED STATES PATENT OFFICE

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TINNING METHOD AND COMPOSITION  
THEREFOR

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4 Claims. (Cl. 91—68.3)

The present invention pertains to a novel method of tinning and to a novel composition used in the method. The principal object of the invention is to provide such a method which is

carried out in substantially one operation, after cleaning the surface to be tinned, and which is performed in a substantially dry state, that is, without the use of an electrolytic bath or molten metal.

According to the invention, the method is carried out by applying the tin in the form of stannous chloride powder, after cleaning or fluxing of the surface to be tinned. Simultaneously with the stannous chloride, powdered zinc is applied for the purpose of reducing the chloride. The novel feature of the invention, resides in a method and a combination of ingredients whereby a metal may be tin plated without the use of a bath, without heat, without current, and without any special apparatus other than an applicator.

With reference to the operation of the process in detail, the surface to be tinned is first cleaned and fluxed with any commercial tinning and galvanizing flux, such as zinc ammonium chloride or zinc chloride. A mixture of stannous chloride and the particular tartrate employed is provided in dry form, preferably by mixing these ingredients in powdered form. The mixture may contain two to ten parts stannous chloride to one part tartrate. A satisfactory mixture consists, for example, of one part potassium borotartrate to four parts stannous chloride, by volume. In another receptacle is provided a suitable quantity of powdered zinc.

After the surface has been cleaned, as above described, a wet cloth or sponge is dipped first in the dry mixture and then in the powdered zinc, taking up a quantity of each. The wet cloth or sponge carrying the ingredients is rubbed over the cleaned surface, whereupon a coating of tin appears. The thickness of the coating may be increased by repeating this process, as a film of tin is deposited with each application.

The mixture of tartrate and stannous chloride may be dissolved in a common solvent, if desired, in which case the application cloth or sponge would be soaked in the solution and then dipped in the zinc powder. However, it is more economical to supply the tartrate and stannous chloride in the form of a dry mixture, at least for shipping purposes. Of course, the user may make up a solution from the dry mixture if he prefers to work with a solution.

With reference again to the tartrate, it may be said that a satisfactory coating of tin is not obtained by the use of the stannous chloride and zinc powder alone. It is believed that the tartrate has a reducing action, removing such oxide as may exist or remain on the cleaned surface and

on the zinc and also preventing the formation of oxide during the reaction. It is also likely that the tartrate has a catalytic action in the reduction of the stannous chloride and its deposition on the surface.

The invention is applicable wherever a metal surface is to be tinned, but is intended more especially for use in the covering of worn spots on tinned vessels used in the dairy industry. In this particular case it is usually not possible to repair a worn spot, and the vessel is often used until there are sufficient spots to warrant plating or coating the entire surface. It will be evident that the present invention effects a substantial economy in enabling the repairing or covering of a single spot whenever it is desired.

It has also been found that the tinning applied in this manner has very good adherence to the base metal.

Although definite quantities have been mentioned, it is to be understood that a considerable range is contemplated within the scope of the invention as defined by the appended claims, while the particular stated proportions have been found to be practical and satisfactory.

What I claim is:

1. The method of tinning consisting in dipping an applicator first in a mixture of stannous chloride and potassium borotartrate or acid potassium tartrate and then in dry pulverized zinc contained in a separate receptacle, immediately before use, and rubbing said applicator on the cleaned surface of the metal to be tinned.

2. The method of tinning consisting of dipping an applicator first in a mixture of stannous chloride and potassium borotartrate or acid potassium tartrate, in the ratio of two to ten parts stannous chloride to one part tartrate, and then in dry pulverized zinc contained in a separate receptacle, immediately before use, and rubbing said applicator on the cleaned surface of the metal to be tinned.

3. The method of tinning consisting of dipping an applicator first in a mixture of stannous chloride and potassium borotartrate or acid potassium tartrate, in the ratio of four parts stannous chloride to one part tartrate, and then in dry pulverized zinc contained in a separate receptacle, immediately before use, and rubbing said applicator on the cleaned surface of the metal to be tinned.

4. The method of tinning a metallic surface consisting in cleaning said surface and rubbing it with an applicator dipped, immediately before use, in a mixture of stannous chloride and potassium borotartrate or acid potassium tartrate and in dry pulverized zinc from a separate receptacle.

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