

UNITED STATES PATENT OFFICE.

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METHOD FOR TINNING AND LEADING METALS.

1,060,938.

No Drawing.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, FRITZ PLATHNER, subject of the Emperor of Germany, residing at 56 Hohenstaufenstrasse, Berlin, Germany, and VICTOR DORN, subject of the Emperor of Germany, residing at 14 Düsseldorfstrasse, Berlin, Germany, have invented certain new and useful Improvements in and Relating to Methods for Tinning and Leading Metals, of which the following is a specification.

This invention relates to a method of and powder for tinning and leading metals, and consists in tin or lead or a composition of the two metals being reduced to powder, mixed to a paint-like paste with a deoxidizing or fluxing substance in a neutral liquid which dissolves the fluxing substance, the paste being spread on the metal article to be tinned or leaded, and then heated to melting point.

The composition of matter being subject matter for a separate divisional patent application is not herein claimed.

The fluxing substance protects the powdered tin or lead against burning, and enables it to be heated until it melts. Substances may be used as fluxing means which are soluble in a neutral or inert liquid, that is to say, in a liquid which does not corrode or affect either the metal to be coated, or the tin or lead powder. Such a fluxing substance is, for instance, chlorid of zinc or chlorid of ammonium, and a suitable neutral liquid is water or alcohol.

Example for tinning.—A mixture of 2 kilograms of tin powder and one kilogram of powdered chlorid of zinc is mixed into a paste with $\frac{1}{2}$ liter of water or alcohol, and the said paste spread in a thin layer on the article to be tinned. The layer in question is then heated by a flame until the tin powder contained therein, is melted.

Example for leading.—A mixture of 2 kilograms of lead powder and 1 kilogram of powdered chlorid of zinc or chlorid of ammonium is mixed into a paste with $\frac{1}{2}$ liter of water or alcohol, and the article to be leaded, coated with the paste. The paste is then heated by a flame, until the lead powder contained therein has been melted.

The mass to be used for tinning or leading can be prepared ready for use either as powder or as a liquid. In the former case, powder of tin, lead or their mixture is mixed with a corresponding quantity of

fluxing substance in the form of powder. For use, it is merely necessary to make the mixture into a paste with a suitable quantity of water or alcohol. If the mass is to be prepared ready for use as a liquid, the powdery mixture of metal powder and fluxing substance with the liquid, or the metal powder with the fluxing substance dissolved in water or alcohol, is formed into a paste ready for use.

The heating can be effected by means of an open flame, for instance, by means of a soldering lamp, or in a furnace, in the same way as in the manufacture of enameled ware.

By means of this process, a protective layer can be produced in a much more convenient manner than by putting on a coat, say of paint. The latter requires time for drying, while the coating prepared according to this invention, is ready immediately. It is exceedingly strong, as each particle of the melted metal powder is soldered to the metal article.

The process according to this invention can also be used in cases where the coating of metal by old methods is impossible, owing to the size or shape of the article to be tinned. Large vessels, for instance, casks for breweries, can be easily tinned, and a damaged or worn tinning can be easily repaired.

This process can also be easily applied for soldering, as it is merely necessary to spread the paste on the surfaces to be soldered, and then to heat them. Soldering can also be effected in cases in which it cannot be done with tin and soldering iron, viz., the soldering of large surfaces and soldering in the interior of an article. Thus, for instance a rivet and rivet hole, screw and nut, can be soldered together by spreading the paste on the screw-thread before putting on of the nut, on the rivet before introducing it, and then heating the nut and the rivet head. The conducting metal will cause the metal powder in the interior to melt, and the soldering thus takes place.

The consumption of metal powder according to this process is exceedingly small, so that it is cheaper than old tinning, leading or soldering processes.

What we claim is:

1. A method of coating metal surfaces with a thin coating of adherent metal which consists in mixing coating metal in pow-

dered condition with a suitable flux and with a liquid vehicle completely volatile at a temperature below the melting point of the coating metal and thereby forming a thin spreading mixture, spreading this mixture on the metal surface to be coated, and then heating the metal thus coated until the volatile vehicle is driven off and the powdered metal melted and fluxed to a thin and substantially uniform adherent coating.

2. A method of coating metal surfaces with a thin coating of adherent metal comprising tin, lead or tin and lead alloy, which consists in mixing the coating metal in the form of fine powder with a fluxing chlorid and a liquid vehicle completely volatile at a temperature below the coating metal and in

which vehicle the chlorid is soluble and thereby forming a thin spreading mixture, spreading the mixture on the metal to be coated, and then heating the metal thus coated until the volatile vehicle is driven off and the coating metal melted and fluxed to a thin, substantially uniform adherent coating.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

FRITZ PLATHNER.
VICTOR DORN.

Witnesses:

FRIEDRICH MEFFEH,
EDUARD WAGNER.