

UNITED STATES PATENT OFFICE

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PROCESS FOR THE TREATMENT OF ALUMINUM

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This invention relates to a process for preparing the surface of aluminum for receiving subsequent treatment of the nature of electro-plating, dry-tinning and soldering.

5 In the preferred form of the invention the amalgam is deposited on to the aluminum surface in an electrolytic bath containing a solution of salts of mercury and tin.

10 In another form of the invention, the amalgam is deposited on to the aluminum surface in an electrolytic bath containing a solution of salts of mercury in combination with other metals particularly tin and zinc.

15 For general purposes a bath composed, for example, of:—caustic soda, sodamide or the constituents thereof, tin chloride, zinc chloride, mercury nitrate, pure potassium hydroxide in water, may be employed.

20 According to the nature of the subsequent process to which the aluminum is to be subjected and to whether the aluminum is pure or in the form of an alloy, the constitution of the bath in which the amalgam is deposited, the time for which the electro deposition is continued and the strength of the current supplied are varied.

After treatment in the bath the aluminum surface is cleaned and is then ready for the subsequent treatment.

30 If it is then desired to tin the aluminum, the article is dipped in the usual way in a bath of molten tin which adheres firmly to its surface or it may be heated and covered or sprinkled with one of the many tin compounds on the market with the same result, or it may be tinned by rolling a thin deposit of tin on the surface.

40 If it is desired to solder the aluminum after it has been subjected to the preliminary treatment, this can be done in the usual way with tin solder or any tin soldering compound on the market.

When the treated aluminum is to be plated with a final coating of metal, this is carried out in the usual way in a plating vat.

50 A suitable composition of the preliminary bath for use in the case when the aluminum is pure aluminum and is to be nickel-plated after treatment in the preliminary bath ac-

cording to the invention is for example the following:—

200 grammes	caustic soda	
200 grammes	sodamide or the constituents thereof	55
40 grammes	tin chloride	
10 grammes	zinc chloride	
5 grammes	mercury nitrate	
10 grammes	pure potassium hydroxide in 20 litres of water.	60

The article is cleaned and pickled in the usual manner and is then placed in the above mentioned preliminary bath for a few minutes under a current of 1.5 volts. 65

The mercury is so distributed in the bath by the chemicals that the coating deposited on the aluminum article by the current is absolutely even. The mercury has the property, together with the other chemicals, of dissolving the metal, and is evenly distributed over the whole surface of the aluminum by the current, seals up any existing pores and combines homogeneously with the aluminum, so that by the presence of the metallic salts particularly zinc and tin in the bath a relatively strong deposit can be obtained. 70 75

With mercury alone, too weak a deposit would be obtained; the problem consists essentially in forming a homogeneous union. 80

The article is then taken out of the bath, rinsed with water and hung in the final bath of nickel, copper, gold or silver, for example, where it is provided with the final coating. 85

On account of the provision of the intermediate layer, this coating adheres extremely fast, so that even when subjected to sudden heating and cooling or rough mechanical treatment the coating does not become detached. 90

Moreover it is found that when a section is taken through the aluminum after treatment in the preliminary bath and examined under a microscope, that no line of cleavage is discernible between the aluminum and the deposited amalgam but that the amalgam merges gradually into the substance of the aluminum in an imperceptible manner. 95

Having now described my invention, what 100

I claim as new and desire to secure by Letters Patent is:—

1. A process for preparing the surface of aluminum for receiving subsequent treatment of the nature of electro-plating, dry-tinning and soldering, consisting in depositing an amalgam on to the aluminum surface in an electrolytic bath containing a solution of salts of mercury and tin.

2. A process for preparing the surface of aluminum for receiving subsequent treatment of the nature of electro-plating, dry-tinning and soldering, consisting in depositing an amalgam on to the aluminum surface electrolytically in a bath containing a solution of salts of mercury in combination with other metals, particularly tin and zinc.

3. A process for preparing the surface of aluminum for receiving subsequent treatment of the nature of electro-plating, dry-tinning and soldering, consisting in depositing electrolytically an amalgam on to the aluminum surface in a bath composed of:—caustic soda, sodamide, tin chloride, zinc chloride, mercury nitrate, pure potassium hydroxide in water.

4. A process for preparing the surface of aluminum for receiving subsequent treatment of the nature of electro-plating, dry-tinning and soldering, consisting in depositing electrolytically amalgam to the aluminum surface in a bath composed of:

200 grammes	caustic soda
200 grammes	sodamide
40 grammes	tin chloride
10 grammes	zinc chloride
5 grammes	mercury nitrate
10 grammes	pure potassium hydroxide
	in 20 litres of water.

5. A process for plating aluminum consisting in first depositing an amalgam on an aluminum surface electrolytically in a bath containing a solution of salts of mercury in combination with other metals, particularly tin and zinc, and in then applying the final plating metal thereon.

In testimony whereof I have signed my name to this specification.

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