

UNITED STATES PATENT OFFICE.

JOHN A. JEANÇON, OF NEWPORT, KENTUCKY.

IMPROVEMENT IN THE ELECTRO-DEPOSITION OF ALUMINUM.

Specification forming part of Letters Patent No. **140,924**, dated July 15, 1873; application filed November 1, 1872.

To all whom it may concern:

Be it known that I, JOHN A. JEANÇON, of Newport, Campbell county, State of Kentucky, have invented a certain new and useful Process for Plating Metallic Surfaces with Aluminum, of which the following is a specification:

My invention consists of a process by which I plate with aluminum obtained from aqueous solutions of its salts.

In carrying out my invention, I first dissolve any desired quantity of a salt of aluminum, such as the sulphate, muriate, nitrate, acetate, cyanide, &c., or the double salt of aluminum and potassium, sodium, ammonium, or other metals, in distilled water, and concentrate the solution to 20° Baumé, (at 50° Fahrenheit,) put it in a vessel suitable in size to commodiously hold the articles to be plated. This vessel is to serve as a precipitating-trough. I then take either four pairs of Smee's zinc-platinum plates, or three of Bunsen's zinc-carbon, their sizes to correspond to the work to be done, and connect the elements of either series intensity fashion, and adapt a thick copper wire or brass wire to each terminal plate of the series to serve as conductors for the anode and cathode in the solution in the precipitating-vessel. I then heat this solution by means of steam, or otherwise, to 140° Fahrenheit, and add a small quantity of such acid as the salt in solution contains to it—in case of a cyanide, dilute sulphuric acid, to slightly acidulate and maintain as near as possible this temperature during the whole operation.

After charging either series with dilute sulphuric acid in case of Smee's, with sulphuric and nitric dilute acids in Bunsen's, battery, I connect it with the precipitating-vessel as follows: Attach a plate of the metal aluminum, of a size suitable to the number and sizes of the articles to be plated, to the wire connected with the terminal negative plate of the battery, the aluminum-plate forming the anode. The other wire, connected with the positive terminal-plate, may be attached to a wire frame or other metallic device on which to suspend the articles to be plated. It is advisable to have both wires of about the same length for the better conduction of an even current. As soon as the battery is in motion

I dip the anode and the articles to be plated into the solution, and leave them therein until the desired thickness of the coat is deposited upon them. The articles must be well cleaned before placing them in the decomposition-trough. When they have received the necessary deposit I remove them from the trough and dip them into a warm and weak solution of carbonate of potash or soda. Afterward I wash them in clean water, and dry and polish them.

In order to insure an uniform deposit care must be taken during the operation to regulate the intensity and quantity of the current to the strength of the solution of each salt used, for the different salts offer different degrees of resistance to the current. The quantity of hydrogen evolved at the cathode during the operation in the depositing-vessel will always to a great extent indicate the intensity of the current. It is also necessary to add occasionally during the operation (in measure as the water and part of the acid in the decomposing solution evaporate) acidulated water to prevent its becoming too much concentrated, and impeding thereby the uniformity of the texture of the deposit.

When solutions of aluminates are used for aluminum deposit, as may be sometimes very advantageously, the above-described process must be somewhat modified. The battery must be of large series, eight or ten elements, the plates to be connected quantity fashion, and the acting fluid very dilute acid, one per cent. of acid being sufficient. The solution in the decomposition-vessel must contain an excess of the alkaline hydrate forming the base of the respective aluminate, and the temperature be at least 200° Fahrenheit, and the anode very small in proportion to the cathode. A platinum anode is much better to be used than one of aluminum, as it resists the action of alkaline solution better than the aluminum, and can with a small size carry more electricity than the other.

Repeated attempts have been made to plate metals with aluminum heretofore by processes intended to plate with aluminum from aqueous solution of its cyanides and double cyanides of potash and aluminum, but none have heretofore proved practically successful, for the

deposit has been thereby so thin, and the time so slow, as to make these processes practically useless.

By using the process and taking the necessary care, as described herein, the whole work can be carried on at will in the regulation of the thickness, density, or texture, such as crystalline, sandy, or black deposit, or regular plate of any desired speed in depositing can be attained with the greatest certainty, and rendered practically useful.

I claim—

The herein-described process for aluminum plating, by means of electricity from aqueous solutions of the salts of aluminum, substantially as herein specified.

JOHN A. JEANÇON.

Witnesses:

N. B. MALER,
JOHN RUPPERT.