UNITED STATES PATENT OFFICE.

ALEXANDER CLASSEN, OF AACHEN, GERMANY.

PROCESS FOR ELECTROLYTIC PRODUCTION OF LUSTROUS METALLIC COATINGS UPON METALS.

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To all whom it may concern:

Be it known that I, ALEXANDER CLASSEN, of the city of Aachen, Prussia, in the Empire of Germany, have invented certain new and useful Improvements in Processes for the Electrolytic Production of Lustrous Metallic Coatings upon Metals, of which the following is a specification.

My invention relates to that class of processes for producing lustrous metallic coatings upon metals in which the coating is produced electrolytically.

The general application of organic metal compounds or of additions of organic substances to electrolytic baths is not new. I was the first to apply the oxalate double salts of the heavy metals for the production of metallic coatings on other metals. (See transactions of the German Chemical Society, Vol. XIV, 1881, and German Patent No. 17,864, October 25, 1881.) Others subsequently proposed to use in place of oxalic acid other organic acids—for example, tartaric acid, acetic acid, benzoic acid, salicylic acid, pyrogallic acid, &c.—or in place of these acids alcohols, ethers, &c., which were said to have a favorable influence upon the separated metals. Others ascribe to bodies belonging to the class of gums, in particular to gum-arabic, a favorable influence on the nature of the metals. None of the organic acids or organic substances heretofore proposed as additions to the electrolytic bath, however, give metallic coatings that are so dense as to possess a lustrous surface. Under all circumstances it is necessary to subject the surface of the coating to a subsequent polishing or burnishing process to attain this. On the other hand, when using in accordance with my present invention the substances herein described the coated objects come out of the electrolytic bath at ordinary temperatures with a very bright metallic luster thereon, and the bright metallic coating adheres so perfectly that, for example, iron plates coated with zinc can be bent to any extent without the zinc splitting off.

In this art it is well known that metallic coatings are produced on metals either electrolytically or mechanically. With the known electrolytic processes, however, only dull metallic coatings can be produced, as above suggested, while the mechanical processes require, on the one hand, considerable expenditure for plant, power, and labor and, on the other hand, the heating of the articles to be coated to such a degree that the process cannot be applied at all in many cases, particularly where fine or delicate castings are to be treated—as, for example, the coating of fine castings with zinc or other metal.

The principal object of my invention is to overcome these objections and accomplish these desirable purposes and to provide a simple, economical, and efficient process for the production of lustrous metallic coatings upon metals.

A further object is to provide a method or process for the production of lustrous metallic coatings upon metals without heating the metals to an undesirable degree and to produce the desired luster without the mechanical treatment of the metal.

In practicing my improved process an ordinary electrolytic bath is provided, in which the articles to be coated and the metal which is to form the coating are to be placed, and to this bath is added a certain quantity of glucoside, or of a substance classed among the glucosides, or an extract of plants, roots, barks, seeds, such as Althæapanama or licorice extract, which contain the said substances or their derivatives, such substances being used either singly or in combination.

For the production of zinc coatings there may be added to the electrolytic bath, which may be composed in the known manner of a solution of twenty kilos crystallized zinc sulfate, four kilos crystallized sodium sulfate, one kilo zinc chlorid, and 0.5 kilo boric acid in one hundred liters water—for example, the extract of five kilos licorice-root.

The articles to be operated upon are placed in the electrolytic bath, as already suggested, and the bath and materials to be operated upon are embraced within an electric circuit, such articles being subjected for the required length of time to the action of the above-described electrolytic bath while at an ordinary temperature and under the usual electrical conditions familiar to those skilled in the art. The articles or metals are allowed to remain in the bath until the desired metallic coating having the required luster is produced and are then removed.

Articles treated in a bath of the above-described kind at ordinary temperature and under the usual electrical conditions will issue therefrom with a coating having a perfect metallic luster.

I claim—

1. The process for the production of lustrous metallic coatings on metals by electrol-

ysis, which consists in adding to the electrolytic bath in which the metal articles are to be treated one or more glucosides.

2. The process for the production of lustrous metallic coatings on metals by electrolysis, which consists in adding to the electrolytic bath in which the metal articles are to be treated, extract of plants, or parts of plants, containing a glucoside.

3. The process for the production of lustrous metallic coatings upon metals, which consists in placing the metal to be treated in an electrolytic bath containing a glucoside, allowing the metal to remain in such bath until a lustrous metallic coating is produced thereon, and then removing the coated metal from the bath.

4. The process for the production of lustrous metallic coatings upon metals, which consists in placing the metal to be treated together with the metal which is to form a coating in an electrolytic bath containing extract of licorice-root, allowing the metal to remain in such bath until a lustrous metallic coating is produced thereon, and then removing the coated metal from the bath.

5. The process for the production of lustrous metallic coatings upon metals, which consists in providing an electrolytic bath composed of zinc sulfate, sodium sulfate, zinc chlorid, boric acid, water and licorice-root embraced within an electric circuit, placing the metal in such bath, allowing the metal to remain in the bath until a lustrous metallic coating is produced thereon, and then removing the coated metal from the bath.

6. The process for the production of lustrous metallic coatings upon metals, which consists in providing an electrolytic bath embraced within an electric circuit and composed of a solution of twenty kilos crystallized zinc sulfate, four kilos crystallized sodium sulfate, one kilo zinc chlorid and 0.5 kilo boric acid in one hundred liters water, adding the extract of five kilos licorice-root, placing the metal in such bath, allowing the metal to remain in the bath until a lustrous metallic coating is produced thereon, and then removing the coated metal from the bath.

ALEXANDER CLASSEN.

Witnesses:

HENRY QUADFLIEG,

JOSEF TAULK.