

UNITED STATES PATENT OFFICE.

EDWARD F. KERN, OF KNOXVILLE, TENNESSEE, ASSIGNOR OF ONE-HALF TO PERCY S. BROWN, OF NEW YORK, N. Y.

ELECTROLYTE AND METHOD OF ELECTRODEPOSITING ZINC.

967,200.

Specification of Letters Patent.

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No Drawing.

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To all whom it may concern:

Be it known that I, EDWARD F. KERN, citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented certain new and useful Improvements in Electrolytes and Methods of Electrodepositing Zinc, of which the following is a specification.

This invention relates to an improved process for the electrodeposition of zinc, and to an electrolyte for use in the practice of the said process.

I have discovered that a dense coherent and adherent deposit of zinc may be obtained by the electrolysis of a bath containing fluo-silicate of zinc in solution, and that particularly good results are obtained by the electrolysis of a bath containing fluo-silicate of zinc and a fluo-silicate of a metal which stands higher than zinc in the solution pressure series, preferably fluo-silicate of aluminum. I have found that the addition of organic material hereinafter termed "organic addition agent," such for example, as grape-sugar to the bath above mentioned improves the operation of my process and particularly improves the appearance of the deposit, and I have also found that in certain cases, the further addition of ammonium fluorid to the bath is advantageous as hereinafter more particularly pointed out.

In the practice of my process, I prefer to use a bath containing the materials above mentioned in the following proportions; the parts being by weight.

Water	100	parts.
Zinc fluo-silicate	12 or more	"
Aluminum fluo-silicate	10	"
Grape-sugar	10	"
Ammonium fluorid	5	"

In the electrolysis of my improved bath, I employ an anode of zinc or an anode consisting of an alloy the greater part of which is zinc. In certain cases, in order to restrain the separation of silica in the operation of my process, I have found it advisable to add ammonium fluorid from time to time, this material being added to the bath at the outset, in the preferred proportion of one part of ammonium fluorid to one or more parts of the zinc in the bath. The addition of the ammonium fluorid thereafter may be made as required.

While I have stated the proportions of the

materials which I prefer to employ, it will be understood that these proportions may be widely varied, and that commercially satisfactory results may be obtained omitting certain of the constituents of the bath as hereinbefore described.

Having described my invention, I claim:

1. A process of electrodepositing zinc, which consists in electrolyzing a solution containing fluo-silicate of zinc, fluo-silicate of a metal which stands higher in the solution pressure series than zinc, an organic addition agent and ammonium fluorid.

2. A process of electrodepositing zinc, which consists in electrolyzing a solution containing fluo-silicate of zinc, fluo-silicate of aluminum, grape-sugar and ammonium fluorid.

3. The herein described process of electrodepositing zinc, which consists in electrolyzing a solution containing fluo-silicate of zinc, fluo-silicate of a metal which stands higher in the solution pressure series than zinc, an organic addition agent, and adding ammonium fluorid thereto from time to time during the electrolysis.

4. The herein described process of electrodepositing zinc, which consists in electrolyzing a solution containing fluo-silicate of zinc, fluo-silicate of aluminum and grape-sugar, and adding ammonium fluorid thereto from time to time during the electrolysis.

5. An electrolyte comprising a solution of fluo-silicate of zinc, fluo-silicate of a metal which stands higher in the solution pressure series than zinc, an organic addition agent, and ammonium fluorid.

6. An electrolyte comprising a solution of fluo-silicate of zinc, fluo-silicate of aluminum, grape-sugar and ammonium fluorid.

7. A process for electrodepositing zinc, which consists in electrolyzing a solution containing a salt of zinc, a salt of aluminium, an organic substance, and a salt of ammonium.

8. A process for electrodepositing zinc, which consists in electrolyzing a solution containing aluminium fluo-silicate, zinc fluo-silicate, and ammonium fluorid.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD F. KERN.

Witnesses:

R. M. DOLL,
J. T. GARRETT.