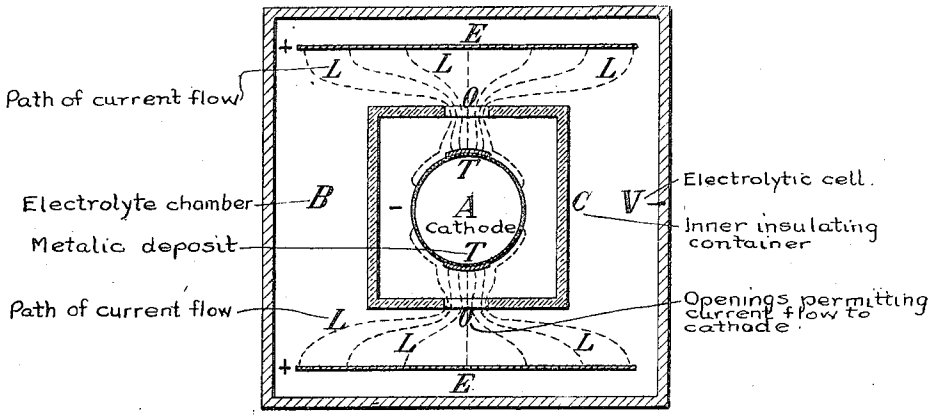
Dec. 16, 1924. 1,519,572

A. WOLF

ELECTROPLATING

Filed July 13, 1923



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by [illegible]

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UNITED STATES PATENT OFFICE.

ALBERT WOLF, OF GEISLINGEN-STEIGE, GERMANY, ASSIGNOR TO WURTTEMBERGISCHE METALLWARENFABRIK, OF GEISLINGEN-STEIGE, GERMANY.

ELECTROPLATING.

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To all whom it may concern:

Be it known that I, ALBERT WOLF, a citizen of Germany, residing at Geislingen-Steige, Wurttemberg, Germany, have invented certain new and useful Improvements in Electroplating, of which the following is a specification.

My invention relates to the production of metal deposits by electro-plating and more especially to the production of deposits of different thickness in a single operation.

It is known to obtain in one operation metal deposits of varying thickness by arranging between the object to be electro-plated and the anode freely suspended plates of an insulating material, said plates being provided with larger or smaller openings facing those parts of the surface on which a thicker coating shall be obtained.

With this method a considerable part of the current lines travels around the insulating plate and produce a relatively thick deposit also on such parts of the surface of the object which do not face the openings, so that, according to the conductivity of the electrolyte, the difference between the thickened and the non-thickened parts amounts for instance only to one and a half or the double. In some cases, this may suffice, but there are other cases in which a considerably greater thickening of the metal deposits is required in certain places.

One has tried to obviate this drawback by covering the parts which shall not be thickened with varnish or the like, after a layer of a certain thickness has been formed thereon, or by placing them between ebonite trays provided with suitable openings, whereby the parts not to be thickened in the bath were protected, or by immersing them only partially in the bath in order to further thicken the immersed parts. All these methods, however, necessitate a twofold immersion of the objects in the bath whereby the amount of work is increased apart from other disadvantages, such, for instance, as the subsequent detaching of the deposit from the object treated at the line of contact between the bath and the air, or the subsequent washing off of the varnish or the like where such had been used, and so on.

The undesirable current lines passing around the interposed insulating plates are obviated, according to my invention, by suspending the objects to be electro-plated in closed cells consisting of an electrically insulating material and provided with openings for the passage of the current only in those places where it is desired to thicken the metallic deposit. It is thus rendered possible to thicken in a single operation the deposit to the fourfold, fivefold, and even sixfold, according to the arrangement of the openings of the cell and the conductivity of the electrolyte.

The cells may consist of a single piece, or of several pieces so as to allow of being taken to pieces, and they may be open at the top in order to facilitate their immersion or suspension if their upper rims project above the level of the bath.

In the drawings affixed to this specification and forming part thereof a device embodying my invention is illustrated diagrammatically by way of example in horizontal section.

In the drawings V is the vessel containing the electrolyte B. C is a closed cell immersed in the bath, and A is the article to be thickened in certain places marked T. To this end the cell C has openings O facing these places and through which the current lines L emitted by the electrodes E come in contact with the points T, causing metal to be deposited in these points in preference to other places.

I wish it to be understood that I do not desire to be limited to the exact sequence of operations and arrangement of parts described and illustrated in the drawings, for obvious modifications will occur to a person skilled in the art.

I claim:—

1. The method of depositing by electrolysis in a single operation a metal layer of non-uniform thickness on a predetermined part of an object immersed in the electrolyte, consisting in preventing the current lines passing from the anode to the cathode to act upon any but the predetermined parts of the object.

2. The method of depositing by electrolysis in a single operation a metal layer of non-uniform thickness on an object immersed in the electrolyte, consisting in preventing a variable number of current lines passing from the anode to the cathode to act upon any but the predetermined parts of the object.

3. Electroplating system comprising in

combination, an electrolyte, a cell of insulating material, immersed in said electrolyte and adapted to surround the object to be electroplated, an electrode extending into said electrolyte outside of said cell and an opening in said cell.

4. Electroplating system comprising in combination, an electrolyte, a cell of insulating material partly immersed in said electrolyte, said cell being open on top and adapted to surround the object to be electroplated and an electrode extending into said electrolyte outside of said cell and an opening in the wall of said cell.

In testimony whereof I affix my signature.

ALBERT WOLF.