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MEANS FOR ELECTROPLATING METALS AND THE LIKE.

APPLICATION FILED JUNE 18, 1917.

1,319,192. Patented Oct. 21, 1919.

Fig. 1.

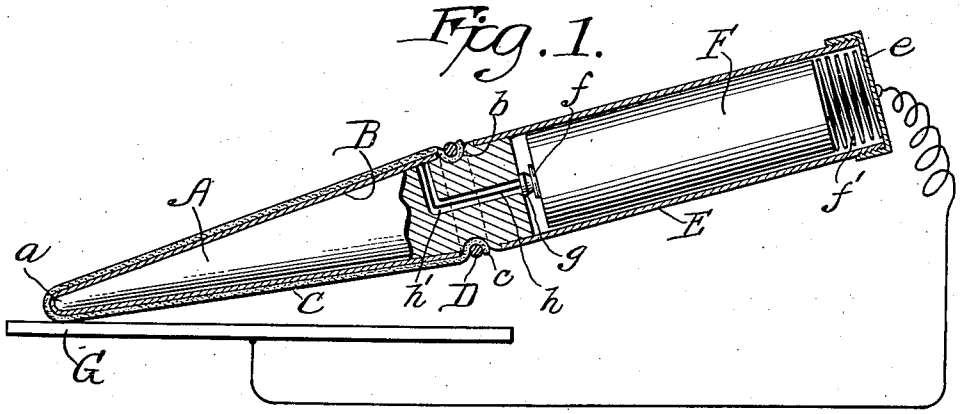


Fig. 2.

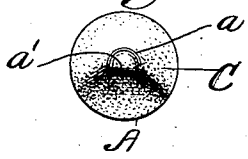


Fig. 3.

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FERDINAND VON MADALER, OF GOOD GROUND, AND JOHN W. VON DER LIETH, OF BROOKLYN, NEW YORK, ASSIGNORS OF ONE-THIRD TO HARRY I. BERNHARD, OF BROOKLYN, NEW YORK.

MEANS FOR ELECTROPLATING METALS AND THE LIKE.

1,319,192. Specification of Letters Patent. Patented Oct. 21, 1919.

Application filed June 18, 1917. Serial No. 175,248.

To all whom it may concern:

Be it known that FERDINAND VON MADALER, a subject of Austria, (who has declared his intention of becoming a citizen of the United States,) residing at Good Ground, Long Island, State of New York, and JOHN W. VON DER LIETH, a citizen of the United States, residing at the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented a certain new and useful Means for Electroplating Metals and the like, of which the following is a specification.

This invention is a device for effecting the rapid electro deposition of metals in the art of electro-plating the surface of one metal (or other substance) with another metal, such as nickel, copper, silver, etc.

The object of the invention is to easily and rapidly apply a metallic coating to the surface of a metal part or object, thereby eliminating the delay and expense which ordinarily is involved in the operation of electro-plating.

In the present invention there are combined in a manually operated implement means for electrically effecting the decomposition of the metal to be applied with means for frictionally rubbing the surface to be coated, so that the operation of applying such metallic coating is adapted to be carried out rapidly and easily, and by an unskilled operator, and, in fact, without resorting to a "pickling" operation or other step preliminary to the application of the metallic coating except, possibly, a mere cleaning of the surface to be coated in order to remove an accumulation of dirt, surface oxidation, or the like.

In the preferred form of the invention, an implement is provided which comprises a core of relatively hard material for carrying a piece of metal constituting the anode and a piece of absorbent material, such as felt, adapted to be saturated with a solution comprising the exciting agent or electrolyte, such solution consisting usually of sulfuric acid and metal salts of the anode. The absorbent material and the metal piece comprising the anode are so combined with the core and with an electric battery (either a wet battery or a dry cell) that the metal of the anode is decomposed by the action of the electrolyte and of the current from the battery, whereby the implement is adapted to be frictionally rubbed upon the surface to be coated in a manner to effect at one operation the application of the metallic coating and to burnish or polish such surface.

In one form of the invention, the implement is self-contained, *i. e.* it is equipped as a part thereof with an electric dry-cell battery incased within the handle of the implement. This form of the invention is readily portable and may be carried from place to place, the same being useful, more particularly, on or around an automobile the various parts of which become tarnished to a greater or lesser extent so as to render it desirable to restore the bright polish to the surfaces of parts, such as headlights, the steering post, the metal trimmings, and various other parts.

It is to be noted that the layer of absorbent material and the anode are associated with a core in such manner that said core affords a backing for the absorbent material and the anode whereby in the use of the implement the operator is enabled to apply the pressure required to burnish and polish the surface upon which the metal coating is applied simultaneously with such polishing and burnishing operation.

Other features of the invention and the advantages thereof will appear in the course of the following detailed description taken in connection with the drawings, wherein—

Figure 1 is a vertical section, partly in elevation, through an electro-plating and burnishing implement embodying one form of this invention.

Fig. 2 is an end view looking at the left of the implement in Fig. 1.

Fig. 3 is a longitudinal section, partly in elevation, illustrating another embodiment of the invention wherein the anode metal is incased between two layers of absorbent material, said figure illustrating the implement when used in connection with a wet battery.

Referring more particularly to the implement shown in Figs. 1 and 2, A designates a core composed, preferably, of hard resisting material, such as wood fiber or other non-conducting material. Said core is tapered longitudinally so as to produce a point *a*, as shown in Fig. 2, and in a preferred form of this invention the tapering core is

circular in cross section, except that one side or face is flattened at *a'*, see Fig. 2, the utility of this construction being hereinafter explained. The core affords a solid backing for the anode B, the same comprising a length of the metal which is to be electrolytically decomposed. This anode may, and preferably does, consist of a strip of copper, nickel, silver, or other metal, the same extending lengthwise of the core and doubled around the pointed end *a* thereof. The metal comprising the anode is covered by or incased within an absorbent material, herein shown as a layer of felt, the length and width of which felt layer is sufficient to enable the same to be doubled around and to thoroughly incase the metal B. The anode is in contact with the surfaces of the core and the felt layer is in contact with the anode, the parts being arranged taut so as to secure the desired intimacy of contact between the felt layer and the anode, whereas the stiff or rigid material of the core A affords the desired backing for the anode and the felt.

Any suitable means are employed for retaining the absorbent felt in a taut condition around and in contact with the anode. As herein shown, the core is provided near its thick end with an annular groove *b* into which is received the doubled part *c* of the felt, after which an elastic or spring ring D fits into the groove *b* so as to confine the folded edge *c* of the felt layer C firmly in position.

In that form of the invention wherein the implement is self-contained, it is preferred to use a tubular or hollow handle E, one end portion of which handle is secured fixedly in the desired way to the blunt end of the tapering core. The tubular handle is closed at its other end by a cap *e*, and within said tubular handle is incased a dry cell battery F. Said battery is shown as having a contact *f* adapted for electrical engagement with a contact *g* attached to the butt-end of the tapering core, the desired electrical engagement between the two contacts *f g* being secured by the pressure of a spring *f'* which forces the dry cell battery toward the blunt end of the core. From the contact *g* a conductor *h* leads through a perforation *h'* provided in the solid core A, the other end of said conductor being attached to, or in electrical engagement with, the anode B.

When it is desired to use the implement, a solution of sulfuric acid and mineral salts is used as the exciting agent or electrolyte in order to saturate the absorbent felt so as to set up the electrolytic action and effect the decomposition of the anode metal. In case the surface is to be silver-plated, it is apparent that a strip of silver should be used as the anode and that mineral silver salts should be used in the solution; in like manner if the surface is to be copper-plated or nickel-plated, then either copper or nickel should be used as the anode, and copper salts or nickel salts used in the solution, respectively.

When it is desired to use the implement, the tapering core with the anode and absorbent felt thereon is immersed into the solution until the felt material becomes saturated. The action of the excitant upon the anode in connection with the electric current from the battery F decomposes the anode, after which the tapering end of the core, or in fact any part thereof, is rubbed over the surface of the article upon which the metal coating is to be applied, said article being indicated in Fig. 1 at G and corresponding to the cathode. The contact of the saturated felt wherein the decomposed metal of the anode is held in suspension with the surface of the cathode completes the circuit so that the metal thus held in suspension becomes deposited upon the surface of the cathode. By frictionally rubbing the felt upon the surface of the cathode the metal is deposited upon said surface and is burnished or polished at one operation, thus making it possible to expeditiously electro-plate and burnish the object.

In this connection, it is to be observed that the core A affords a stiff rigid backing for the anode and the absorbent felt, whereby these two elements are retained always in a condition for operation, and the operator is able to apply the pressure to the implement necessary to effect the burnishing or polishing operation. The battery F can easily be removed from the tubular handle and a fresh battery placed in position, thus maintaining the implement in efficient condition for operation. Furthermore, the elastic ring D can be sprung out of the groove, the felt C and the anode B removed, and other anodes and felts placed in position upon the core so as to be held taut thereon by the ring D.

The tapering and pointed core is found by practical experience to be quite advantageous, for the reason that this form of core enables the implement to be used in corners and in places which otherwise would be inaccessible, and, as before stated, the core enables the operator to apply the pressure required to burnish the surface upon which the metal is electrolytically deposited.

The implement shown in Fig. 3 embodies the salient features of the invention as heretofore described and illustrated in Figs. 1 and 2, except that the core is constructed to furnish a handle H and to adapt said implement for use in connection with a wet battery F'. The core A is tapering to produce the rounded and pointed end *a*, one face of the core being flattened. Upon this core is carried the metal comprising the

anode, but instead of positioning the metal B in direct contact with the surface of the core, it is preferred to incase the anode B between two layers of absorbent material, such as felt, said layers being indicated at C C′, and the two layers affording increased capacity for the absorption of the liquid excitant, whereby the anode is subjected to the action of said excitant on the inner and outer surfaces of said anode, resulting in increased capacity of the liquid excitant absorbent for carrying said liquid excitant and improving the electrolytic action thereof upon the anode. The layers of absorbent material and the anode are retained in the groove *b* of the core by the ring D, all as heretofore described. Instead of using a hollow handle, or a handle separate from the core, the butt-end of said core A is extended beyond the groove *b* and is fashioned into the handle H, the latter being provided with a longitudinal passage *h′* through which runs a conductor *h*, one end of which is attached to the cathode metal and the other end to the wet battery F′, from which battery runs a conductor h^2 to the cathode G. It is believed that the operation of the implement shown in Fig. 3 and the advantages of the invention will be apparent from the prior description taken in connection with the drawings.

Having thus fully described the invention, what we claim as new, and desire to secure by Letters Patent is:

1. An implement of the class described embodying a core, an anode composed of relatively thin flexible metal substantially incasing the core, said core constituting a substantially rigid backing for said flexible metal of the anode, absorbent material incasing the anode, and a source of electrical energy.

2. An implement of the class described embodying a core, an anode composed of relatively thin flexible metal, said anode substantially incasing the core and said core constituting a backing for said anode, a layer of absorbent material substantially incasing the anode, means for retaining the anode and the absorbent material in fixed relation to the core, and a source of electrical energy.

3. An implement of the class described embodying a core composed of rigid material, an anode composed of relatively thin flexible metal, said anode extending lengthwise of the core and substantially incasing the latter on its respective longitudinal sides, a layer of absorbent material incasing the anode, means for attaching the absorbent material directly to the core, and a source of electrical energy.

4. An implement of the class described comprising a tapering core of relatively hard material, an anode separate from the core, an absorbent material incasing the anode and covering said tapering core, and a source of electrical energy.

5. An implement of the class described comprising a tapering core of relatively hard material, an anode doubled around the tapering core, said anode being separate from the core, an absorbent felt incasing the anode and the core, and a source of electrical energy.

6. An implement of the class described comprising a tapering core of relatively hard material, an anode positioned opposite the respective faces of said tapering core, an absorbent material incasing the anode and the tapering part of the core, and a source of electrical energy.

7. An implement of the class described embodying a core, an anode composed of relatively thin flexible metal, said anode substantially incasing the core upon its longitudinal surfaces, an absorbent material incasing said anode, said core constituting a rigid backing for the anode and the absorbent material, and a source of electrical energy.

8. An implement of the class described embodying a tapering core composed of relatively hard material, an anode composed of relatively thin flexible metal substantially incasing the core and extending lengthwise thereof, said anode being separate from the core, absorbent material incasing the anode, means for rigidly attaching the absorbent material directly to the core, and a source of electrical energy.

9. An implement of the class described comprising a core of relatively hard material, said core having a hollow handle, an absorbent material backed by the core, an anode in contact with said absorbent material, and a source of electrical energy incased within said hollow handle.

10. An implement of the class described comprising a tapering core composed of relatively hard material, said core being provided with a hollow handle, an anode, an absorbent material backed by said core, said anode being in contact with said absorbent material, and a source of electrical energy incased within said hollow handle.

In testimony whereof we have hereunto signed our names.

FERDINAND VON MADALER.
JOHN W. VON DER LIETH.