A. RODECK.

PROCESS FOR THE ELECTROLYTIC DEPOSIT OF METALS.

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1,003,799. Patented Sept. 19, 1911

Fig. 1

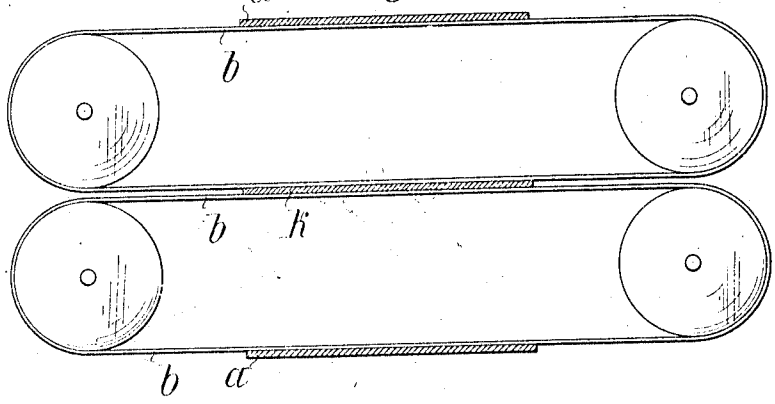

Fig. 2

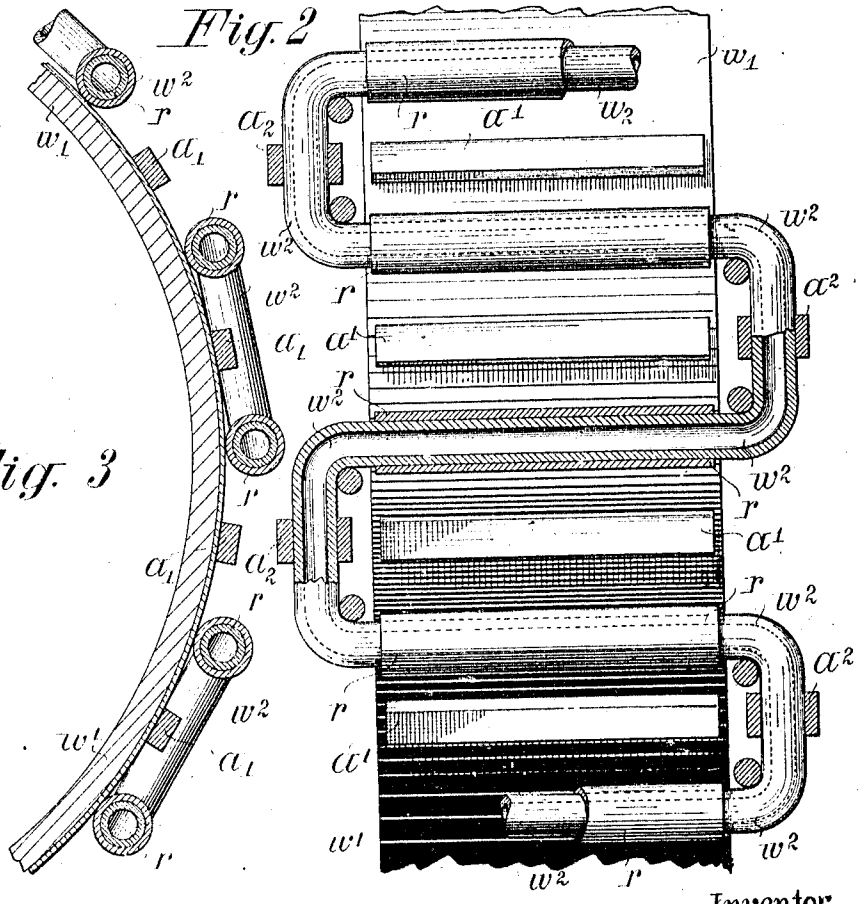

Fig. 3

Witnesses

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PROCESS FOR THE ELECTROLYTIC DEPOSIT OF METALS.

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To all whom it may concern:

Be it known that I, ARMIN RODECK, engineer, a subject of the Emperor of Austria-Hungary, residing at Milan, in the Kingdom of Italy, whose post-office address is 18 Via Principe Umberto, have invented a certain new and useful Process for the Electrolytic Deposit of Metals, of which the following is a specification.

The present invention relates to a process especially adapted for the separation of metals electrolytically by aid of mechanism. For this purpose it is old in the art to cause anodes covered with non-conducting porous materials and acting as electrolytic supports to move mechanically, or to rotate, and moreover in a transverse or longitudinal direction with regard to the cathodes, or with regard to the motion given to the articles on which the metals are to be electro-deposited. In this old process, however, the anode must always be of that form which corresponds to the profile of the object to be electro-plated (for instance in the electro-deposition of metal sheets it is usual to bring it into the form of cylindrical rollers and so forth), and this obviously considerably increases the cost of the process in the case of electrolytic deposition of certain metals on a large industrial scale. To this drawback there is further added the objection that in consequence of the large consumption of metal at the anode, as is necessary in industrial working, the original dimensions of the anode cannot be long maintained; and consequently the coating or deposit will after a relatively short time fail to closely adhere, which gives rise to an additional inconvenience. Finally, if the surface of the object to be coated is not entirely smooth and it is desired to obtain a good uniform deposit, the coating or deposit must have a certain thickness, and this increases the resistance during the transfer as well as the current tension required.

In the process which forms the object of the present invention, on the other hand the above described drawbacks are avoided by inserting between an ordinary fixed anode and a movable cathode a mechanically moved transferring mechanism of suitable material, which is either naturally conducting or is made conducting at the operative surface. This mechanism usually receive a porous non-conducting coating of material which serves as a carrier of the electrolyte, and adapts itself in its outer form to the shape of the object to be coated. The electric current passes in this new process from the anode through the porous material to the transferring mechanism, and from this latter to the cathode; where naturally the quantity of metal depositing upon the transferring mechanism from the anode will at any given moment exactly equal the quantity proceeding from this mechanism to the cathode, because the current strength is throughout the same. It is therefore not necessary to make the anode itself of that shape which corresponds to the profile of the article to be coated, but that form of anode which can be obtained most cheaply in commerce, as for instance, bars, rods, sheets or even scraps can be used by providing them with suitable current connections and pressing them against the transferring mechanism. It of course is true, by reason of the fact that the electric current must pass twice through the coating of material which really constitutes secondary electrodes, and also acts as a carrier of the electrolyte, that the resistance to transfer is increased. But on the other hand in consequence of the wide range of choice of the shape and material of the transferring mechanism, one can so select said mechanism that quite a thin coating, even on a somewhat rough surface of the object to be coated, will effect a perfect deposit; and therefore the process can be easily carried on with the ordinary current tension usually employed in the electro-depositing operations.

Referring to the accompanying drawings forming a part of this specification:— Figure 1 is a diagrammatic view illustrating one form of mechanism for carrying out my process when flat sheets are to be formed; Fig. 2 is a sectional view of a different mechanism for forming hollow tubes; and Fig. 3 is a sectional view of the parts shown in Fig. 2, when looking down on the same.

If it is desired to electro-plate flat sheets, the transfer mechanism may be as shown in Fig. 1, in the form of metallic strips *b* which run over rollers and which take on one side metal from the stationary anode *a* and give up the same quantity of metal simultaneously at the other side to the cathode *k*, which latter member may receive a corresponding progressive motion. During the operation, in case of need, there is supplied to the coating of the transfer mechanism *b*

by carrier rollers or other suitable devices, not shown, the electrolytic fluid in order to maintain constant the concentration and degree of moisture of the coating.

In order to coat tubes inside and out with an electro-deposited coating, the process may suitably be carried out in the manner illustrated in Figs. 2 and 3, in which the transferring mechanism for the electro-depositing of the outside of the tubes is formed as a cylindrical roller w', to the periphery whereof are attached the tubes r extending parallel to the axis of rotation of the roller and constituting cathodes. These tubes may turn on their own axis during the rotation of the roller by reason of the existing friction, or by means not shown, while the anodes a' consisting of the precipitating metals or metallic alloys are pressed at suitable points between the tubes against the coating of the roller w'. At the same time the deposit can be obtained on the insides of the tubes r by means of one or more cords, wires or the like w^2 covered with a suitable carrier for the electrolyte, which cords are either themselves conducting or are made conducting, and are passed through suitably formed anodes a^2 and caused to move through the interior of the tubes r. By this means the metal which is removed by the transferring mechanism from the anodes is carried to the inside of the tubes which form the cathodes.

What I claim is:—

1. The method of electrolytically forming articles of a desired shape, which consists in electrolytically and successively depositing a given quantity of metal upon one portion of a moving cathode, and forming the desired article by simultaneously and successively depositing the same said quantities of metal from another portion of said cathode, substantially as described.

2. The method of electrolytically forming articles, which consists in successively depositing given quantities of metal on one portion of a moving cathode; forming the desired article by simultaneously and successively plating out the same said quantities of metal from another portion of said cathode; and in suitably moving said article relatively to said cathode during the plating operation, substantially as described.

3. The method of electrolytically forming hollow articles, which consists in successively depositing given quantities of metal on one portion of a moving cathode; forming the desired article by simultaneously and successively plating out the same said quantities of metal from another portion of said cathode; in suitably moving said article relatively to said cathode during the plating operation; and in simultaneously depositing metal on the interior of said article, substantially as described.

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

ARMIN RODECK.

Witnesses:
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