

UNITED STATES PATENT OFFICE.

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METHOD OF SEPARATING ELECTRODEPOSITED METALS FROM LEAD MATRICES.

No. 903,404.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES REVERDYS, a resident of the borough of Brooklyn, of the city of New York, in the State of New York, have invented certain new and useful Improvements in Methods of Separating Electrodeposited Metals from Lead Matrices, of which the following is a specification.

In the manufacture of electrotypes, lead has to a considerable extent supplanted wax as a matrix material. In using lead as a matrix material however, considerable difficulty has been experienced in separating the electrolytically formed shell on account of the tendency of this shell and the lead matrix to unite themselves together in a substantially integral piece. It has been attempted to overcome this difficulty by employing powdered graphite which is brushed over the surface of the lead matrix, previously to the production of the shell thereon, in order to form what may be referred to as a separating layer between the matrix and shell. This separating layer of graphite does not interfere with the electro-deposition of the metal forming the shell and in many cases the use of graphite in this way is satisfactory. It is extremely difficult however, where a matrix has deep cavities, for instance, such as a matrix produced from a type form, to apply the graphite in such a way as to form an effective separating layer on account of the difficulty of reaching the deep parts with the bristles of the brush and of making the graphite adhere sufficiently under the treatment which it is possible to give these parts. To overcome this difficulty an adhesive substance has been employed in addition to the graphite such as a solution of beeswax in benzin, but this remedy had the disadvantage or objection that the solution would accumulate in small cavities and would become concentrated on account of the evaporation of the benzin so that some cavities would become filled up with wax and graphite. The formation therefore of a separating layer of graphite between the lead matrix and the electrolytically deposited shell has not been satisfactory in all cases and some better method of rendering easy the separation of the shell and matrix has been sought.

The object of the present invention is to provide such a method.

In its broad aspect, the invention consists

in treating the surface of the lead matrix with some substance which can easily penetrate the remoter and smaller cavities of the matrix and will react with the lead to form a thin film thereon, consisting of some salt of lead depending upon the particular substance employed to react therewith, which thin film will not interfere with the electro-deposition upon the surface of the matrix but which will be effective in rendering the separation of the shell subsequent to its formation, easy and convenient. I have discovered that for this purpose the lead matrix may be treated with carbonic acid to produce a thin film of carbonate of lead thereon which fulfils all of the conditions.

Many different means may be employed for applying the carbonic acid to the surface of the lead matrix, as will be obvious. The lead matrix, may, for instance, be placed in a closed box in which carbonic acid may be generated from marble dust and a dilute mineral acid such as muriatic acid, the marble dust and acid generating carbonic acid gas which attacks the surface of the lead matrix, even to the remotest and smallest cavities while in a still nascent condition. I prefer, however, to employ carbonic acid gas to the matrix in the presence of heat in order to expedite the reaction and for this purpose I may jet the gas upon the surface of the matrix by an air blast or by the use of steam. In this way the acid is driven with considerable force into the deepest and smallest cavities and under the action of the heat immediately generates the superficial film of carbonate of lead. Moreover, I may also facilitate the separation of the matrix and shell by employing in addition to the carbonic acid or in addition to the carbonic acid and steam, an oily or fatty substance such as paraffin oil or an alcoholic solution of rosin, the blast of the gas, in such a case entraining the oily substance so that it is sprayed upon the surface of the matrix together with the gas.

It has been found in practice that by the treatment which has just been described, an exceedingly thin film is formed over the surface of the lead matrix which does not interfere at all with the electro-deposition of metal thereon and which greatly facilitates the separation of the shell as soon as it is formed. Furthermore, admirable results have been obtained particularly with mat-

rices having deeply seated recesses and small cavities which were not only difficult but practically impossible to reach with the old graphite methods.

5 It will be understood that the invention is not limited to the employment of an oily substance, or to the use of steam or compressed air or to the employment of heat, but that these features of the described
10 method have simply been found to be preferable in obtaining the best results and in accelerating or expediting the reaction. Moreover, the invention is not limited to the use of carbonic acid or to the formation
15 of carbonates, as it is possible that other thin films may be formed upon the surface of the lead matrix by employing some other substance capable of reacting with the lead to produce a thin film which satisfies the neces-
20 sary conditions. Furthermore, it should be mentioned that the word "film" has been used throughout the description and claims without any particular significance in so far as this term might be taken to describe the
25 structure of the deposit formed upon the surface of the matrix. In other words, the word "film" is used as a reference to the deposit rather than as a term defining the particular nature of the deposit. Applicant
30 has not determined whether this deposit is in the nature of a cohesive coating as the term "film" might imply or whether it is composed of isolated or separate particles, or whether under different conditions the
35 structure of this deposit might be varied.

It will be understood that the method is applicable to the treatment of lead matrices which are designed to be used for any and every purpose as well as for lead matrices
40 which are used in the manufacture of electrotypes as referred to at the beginning of this specification.

I claim—

45 1. The herein described method of treating lead matrices which method consists in producing by the action of a suitable gas upon the surface of the matrix a film of a

salt of lead previous to the production of the electro deposit thereon.

2. The method of rendering an electro- 50 deposited metal upon a lead matrix easily separable from the matrix, which consists in treating the surface of the lead matrix with a suitable gas to form a salt of lead thereon previous to the producing of the electro-de- 55 posit thereon.

3. The herein described method which consists in treating the surface of a lead matrix with a gas which will react with the lead to form a lead salt upon the surface previously 60 to the producing of the electro-deposit thereon.

4. The herein described method which consists in treating the surface of a lead matrix with carbonic acid to form a thin film of 65 carbonate of lead upon the surface of the matrix previously to the production of the electro-deposit thereon.

5. The herein described method which consists in treating the surface of a lead matrix 70 with a blast of carbonic acid previously to the producing of the electro-deposit thereon.

6. The herein described method which consists in treating the surface of a lead matrix with carbonic acid and steam previously to 75 the production of the electro-deposit thereon.

7. The herein described method which consists in treating the surface of a lead matrix by spraying upon the surface of the lead matrix carbonic acid commingled with an 80 oily or fatty substance previously to the production of the electro-deposit thereon.

8. The herein described method which consists in treating the surface of a lead matrix by spraying upon the lead matrix a mixture 85 of carbonic acid, steam and paraffin oil previously to the production of the electro-deposit thereon.

This specification signed and witnessed this 22nd day of October, 1907.

CHARLES REVERDYS.

Signed in the presence of—

ALFRED W. KIDDLE,

MARJORIE ROLLINS.