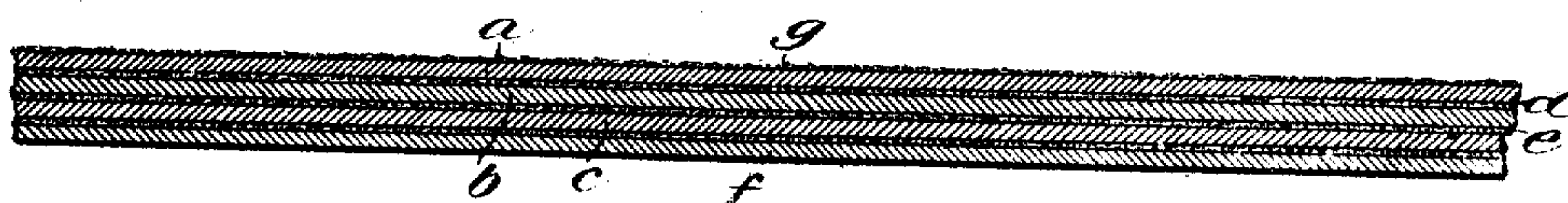


922,199.

H. SCHIMANSKY.
LEAD MATRIX.
APPLICATION FILED MAR. 24, 1908.

Patented May 18, 1909.



Witnesses:

H. H. Derrigan
Alfred R. Anderson

Inventor:

Hermann Schimansky
by Van Delden & Schenck
Attorneys

UNITED STATES PATENT OFFICE.

HERMANN SCHIMANSKY, OF RIXDORF, NEAR BERLIN, GERMANY.

LEAD MATRIX.

No. 922,199.

Specification of Letters Patent.

Patented May 18, 1909.

Application filed March 24, 1908. Serial No. 423,067.

To all whom it may concern:

Be it known that I, HERMANN SCHIMANSKY, a subject of the King of Prussia, residing at Rixdorf, near Berlin, Kaiser Friedrichstrasse 238, in the Kingdom of Prussia, German Empire, have invented new and useful Improvements in a Lead Matrix, of which the following is a specification.

In the production of a relief printing surface for the purpose of making a galvanoplastic cliché there are used plastic substances such as wax, india-rubber or the like. Lead has also latterly been employed for this purpose. The molding is effected by pressing the plastic substance or the lead by means of powerful presses into the original picture. This, however, always requires the use of pressure, which, while larger or smaller in accordance with the character of the original must, if lead is employed, be very considerable so that impressions can thereby be produced only of such originals as are hard enough to afford sufficient resistance to the hard lead, that is to say, the originals must, for instance, be made of such substances as zinc, copper or brass. Matrices formed of the ordinary type material, as well as wood cuts and clichés of copper deposits (galvanos) are very injuriously affected by the great pressure requisite and are damaged in their more delicate parts.

If the clichés used are formed of wax the warm plastic mass is apt to become pressed deeply into the recesses of the composition with the result that when the matrix is raised, distortions of the face of the composition cannot be avoided and that long and tedious work is required to cut out the deep fields, that is to say, the recesses, this being necessary before there can be imparted to the matrix the necessary conducting capacity for the electric current by dusting it with graphite.

When molding in a plastic substance or in solid lead it has heretofore only been possible to use flat presses, and it has, moreover, been necessary to determine the size and the ratios of pressure to be employed if the requisite pressure is to be obtained, in a manner appropriate to the original to be reproduced.

Now by means of the present invention,

there can be produced a matrix for the reproduction of relief printing surfaces which obviates the defects which occur when the reproduction is made by means of plastic substances or of lead.

In the manufacture of such a matrix there are used, for example, as shown in the accompanying drawing, three sheets of lead foil of the thickness of tissue paper: the second sheet (b) being attached to the back of the first (a) by means of an acid-resisting, sticky, soft substance (d), and the third sheet (c) attached to the back of the second sheet, by sticky substance (e) in the same manner. The sticky, soft, plastic substance (d or e) employed for this purpose preferably consists of a mixture of 60 parts of bees-wax, 20 parts of asphaltum dissolved in turpentine and 20 parts of Venice turpentine. A lead foil matrix formed in the manner just described, consists therefore of five layers, that is to say, three sheets (a, b, c) of lead foil and two layers (d and e) of soft wax placed between the layers of lead foil.

Such a matrix will only penetrate into the original to such an extent as is required for the purpose to be achieved and on account of its plasticity will not injure this one in any manner whatever. Such matrices may be stamped also in a cylinder press and can be used, as desired, for the reproduction of larger or smaller forms; the impression produced being equally sharp in both cases.

For the purpose of producing the impression the matrix is placed with its printing surface, which must be quite free from oxidation or impurities of any kind upon the cleaned original, and there is then placed thereon a support of soft paper, or of a soft felt, which however must be firm in its texture, or of any other suitable soft material. Furnished with these supports the original is subjected to pressure in a press or in any other suitable manner.

When the process above described is intended to be used for the printing of larger objects it is advisable to strengthen the finished matrix so as to prevent its being bent when placed in the electrolyte bath or the like. For this purpose, after the three sheets of lead foil have been pressed in the manner

already described into the matrix, while it is still on the original, there is attached thereto by means of the adhesive substance already referred to, a flat strengthening plate 5 *f*, preferably of lead of about one millimeter thickness, which is provided on its outer side with a coating of current-insulating material, preferably paper covered with asphaltum. Against the back of such a 10 strengthening plate there is then placed in addition a supporting sheet composed of some hard material, such, for instance, as strong pasteboard, cardboard or the like, and the whole is then again subjected to pressure, 15 which however need not be very considerable, as its only purpose is to effect a combination of the strengthening plate with the projections on the rear of the matrix. If, however, it is not desirable to employ a 20 strengthening plate, the insulating paper already mentioned is laid on the three pressed sheets of lead foil, or any suitable insulating coating may be used. From a matrix, such as described, the galvanoplastic 25 cliché can then be obtained in the usual manner. It has however been found by experience that, especially when the employment of a calendar press is impracticable, at those parts where the pressure apparatus exerts 30 only a small amount of pressure, the action of the plastic mass lying between the separate thin layers of lead foil will result in the reproduction of all the coarse details of the original, but that the more delicate lines of 35 the original, such, for instance, as fine grained autotypes, will not come out with the necessary sharpness as the layer of lead, after all, possesses a certain thickness and hardness and does not penetrate easily into all the 40 more delicate portions of the original. Such matrices, made of sheets of lead foil, have moreover the tendency to expand under the influence of the somewhat considerable pressure employed and thus to become buckled. 45 Now this invention obviates also this comparatively trifling defect by rendering the printing surface of the lead foil matrix more sensitive to pressure.

After the lead foil matrix has been manufactured in the well known manner by cementing several sheets of lead foil together by means of the plastic substance and the insulating layer has been attached to the back thereof, it is placed back downward upon a 55 plate which is heated to an extent corresponding with the melting point of the wax employed, and then the printing surface, that is to say, the side which is placed on the printing form for the purpose of reproducing 60 the image of the original is coated with a very thin layer of a plastic substance *g*, sufficiently thick however, to enable impressions to be taken through it of the finest portions of the shades of autotypes. The best substance for this purpose is beeswax to which

5 per cent. Venice turpentine have been added. To prevent this coating from adhering to the original when printing, the printing surface of the coated matrix is powdered with graphite or some other suitable powder. 70

The operation of printing by means of a matrix in accordance with this invention is as follows:—As the thin coating of a soft plastic substance is situated between the original to be reproduced and the layer of 75 lead foil, both harder than itself, it will penetrate into the most delicate parts of the original, upon the exertion of a slight pressure. The plastic mass will thereby be pressed aside into the recesses at the places which 80 represent in the block the picture to be printed in such manner that there remains on the printing portions only the very smallest trace of the plastic mass, and that the lead is exposed at the portions constituting the image in such manner as not to affect injuriously the current-conducting capacity thereof. In order to render current conducting the portions not affected by the pressure it is then sufficient slightly to brush them over. 85 90

Matrices manufactured in accordance with this invention combine the advantages of the easily facsimiles forming wax matrix with those of the readily conducting lead matrix and may in this form be considered as constituting the most perfect means for effecting 95 the reproduction of a print.

This invention in consequence of the small pressure required presents the further advantage that the matrices do not in the least 100 change their size and that printing blocks which are mounted on soft wood need no longer be placed on a metal foundation for the purpose of printing therefrom, but that they can be printed at once in the condition 105 in which they stand in the composition.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim and desire to secure by Letters Patent is: 110

1. A lead matrix consisting of layers of thin sheet lead foil and soft layers of wax, alternately arranged and cemented together, and a thin coating of a soft plastic mass 115 spread over the printing surface of the lead matrix.

2. A lead matrix consisting of layers of lead foil and soft layers of wax, alternately arranged and cemented together; a thin coating of a soft plastic mass spread over the 120 printing surface of the lead matrix and a flat strengthening plate attached to the back thereof.

3. A lead matrix consisting of layers of 125 lead foil and soft layers of wax, alternately arranged and cemented together; a thin coating of a soft plastic mass spread over the printing surface of the lead matrix and an insulating coating on the back thereof. 130

4. A lead matrix composed of layers of
lead foil and soft layers of wax, alternately
arranged and cemented together; a thin coat-
ing of a soft plastic mass spread over the
5 printing surface of the lead matrix and at-
tached to the back thereof a flat strengthen-
ing plate and an insulating coating.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

HERMANN SCHIMANSKY.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.