

No. 662,852.

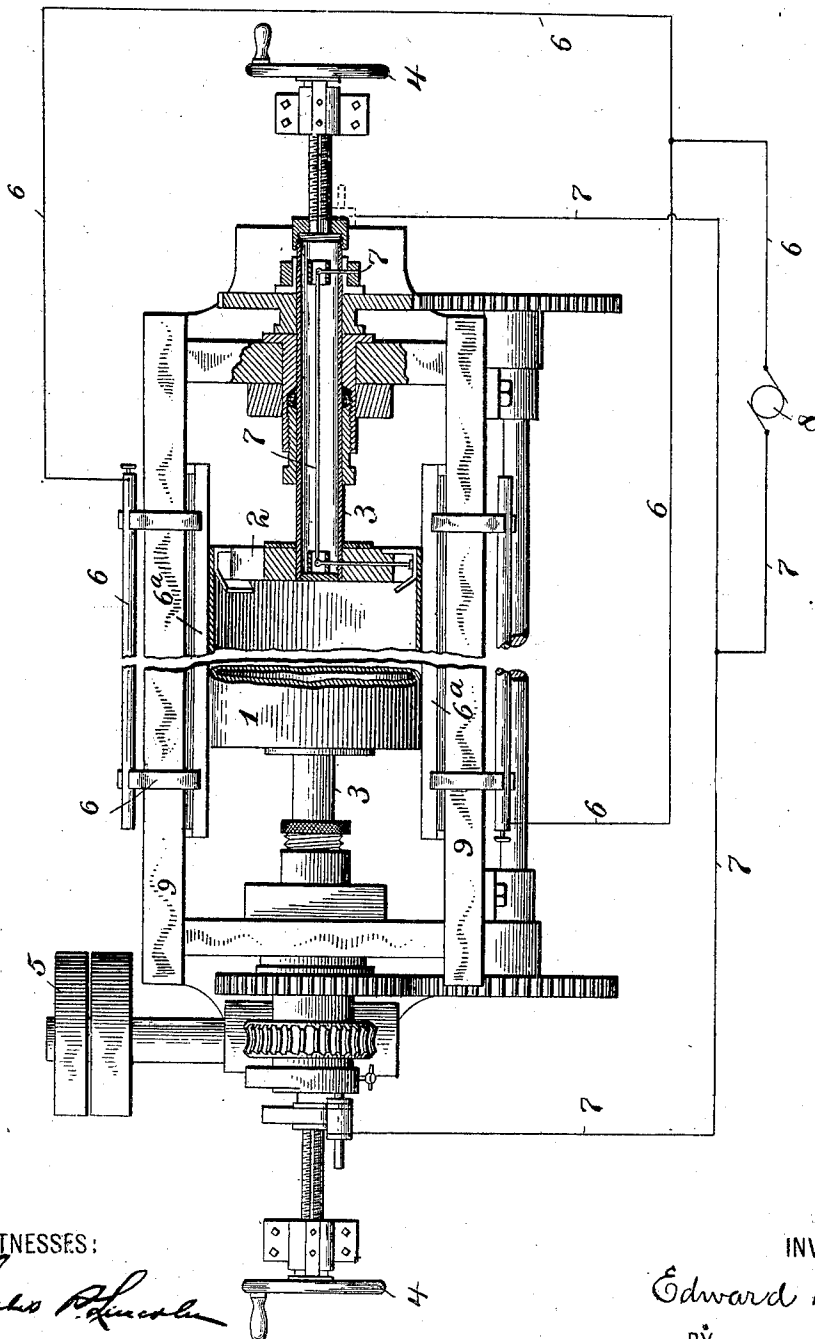
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E. HETT.

METHOD OF PRODUCING SURFACES FOR PRINTING, &c.

(Application filed Nov. 1, 1899.)

(No Model.)



WITNESSES:

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METHOD OF PRODUCING SURFACES FOR PRINTING, &c.

SPECIFICATION forming part of Letters Patent No. 662,852, dated November 27, 1900.

Application filed November 1, 1899. Serial No. 735,485. (No specimens.)

To all whom it may concern:

Be it known that I, EDWARD HETT, a citizen of the United States, residing at New York, (New Dorp, Staten Island,) in the county of Richmond and State of New York, have invented a certain new and useful Improvement in Methods of Producing Surfaces for Printing, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to methods for producing surfaces adapted for use as a printing or drawing or transferring or engraving surface; also to methods for producing planographic and lithographic printing-surfaces. It has for its object to produce surfaces of proper texture and porosity and such purity of composition, evenness, and fineness of grain and finish as to render them especially valuable and well adapted for use as printing-surfaces or engraving, transferring, or drawing surfaces.

My invention consists in constructing a base with a surface of the smoothness and finish required in the completed printing, drawing, transferring, or engraving surface and depositing an even and uniform surface electrolytically over the entire surface thereof; also in constructing such a base and placing it as a cathode in an electrolytic bath and electrolytically depositing the desired surface thereon from any suitable anode and during the operation changing the relative position of any member or members of the electrolytic bath to any other member or members preferably by imparting movement to the said cathode in the electrolytic fluid.

In the drawing accompanying this specification and forming a part thereof I have shown one means by which my improved process may be carried out in its preferred form, and I will now proceed to describe the said means and in connection therewith the best manner known to me of carrying out my improved process.

Referring now to the means shown in the drawing, 1 is a base upon which I deposit by electrolytic deposition the desired surface adapted to be thereafter used as a printing or drawing

or transferring or engraving surface. This surface may be of any suitable size or shape. As shown, it is a tube having a continuous cylindrical surface. I construct the base so that its surface will have the same smoothness and perfection of shape and finish which is required in the completed printing, drawing, transferring, or engraving surface. It is preferably made of substantially the same size as the desired completed surface. I place said base as a cathode in electrolytic bath 9.

2 indicates spring clamping devices mounted upon horizontal shafts 3, suitably mounted in stuffing-boxes in the end walls of the bath. One of these clamping devices and its shaft is shown in section in the drawing; but it will be understood that the other clamping device is likewise arranged and connected with its shaft. These clamping devices enter the hollow ends of tube 1 and sustain and revolve it and carry the current to it in the bath. These shafts are movable in and out by turning hand-wheels 4 in the ordinary well-known way for permitting the removal or insertion of a tube. While the tube is in the bath it is firmly held and rotated by means of the spring clamping devices and the shafts. Any suitable means may be employed for driving the shafts. As shown, this is accomplished through pulley 5, driven from any suitable source through the gearing shown. Preferably a slow rotary movement is thus given to the base in the electrolytic fluid. Plates 6^a, of any suitable metal, constitute the anode, the base constituting the cathode. The cathode and anode may be made of any suitable material; but I prefer to employ copper for the base and zinc for the anode, thus producing a cylindrical electrodeposited zinc surface.

8 is any suitable source of current. In the usual way one terminal of the circuit consists of the anode 6^a electrically connected to 8 by electric connection 6, and the other terminal is the tube itself through electric connection 7, the ordinary commutator-brush conveying the current to the terminals in the slowly-rotating end shafts.

The electrodeposited coating is adherent to and substantially integral with the base and presents exteriorly a surface suitable without other or preparatory treatment for

purposes of printing, drawing, transferring, or engraving.

By my improved process a surface is produced of such smoothness, porosity, texture, 5 purity of composition or material, evenness of grain and fineness, and uniformity and perfection of finish that it is especially suitable and well adapted for use as a printing, drawing, transferring, or engraving surface. By this 10 it is to be understood that the surface produced is in its nature adapted to receive a design after the manner of lithographic surfaces either by drawing the design directly thereon or by transferring it thereto from transfer-paper and then damping the surface and 15 rolling it up after the lithographic method of transferring; but having received the design the surface is adapted to be developed into a printing-surface of the character desired, 20 as by light etching into a planographic or lithographic printing-surface or by engraving or deep etching into a relief or intaglio printing-surface. The surface is especially serviceable in lithographic transferring or printing. 25 The shape and size of the base may be varied as desired. When curved, its curvature or size may be varied and the material of which it is composed may also be varied as desired, although I prefer, as stated above, 30 to make it of copper. The electrolytically-deposited coating may be made of any suitable material, although zinc is preferred, and the thickness of the coating may also be varied as desired. The essential features of the 35 invention in these respects consist in painstakingly constructing the base in any given case with a surface of the exact predetermined size, shape, smoothness, and finish required in the completed form and in electrodepositing a coating which shall be even and 40 uniform over the entire outer or printing surface of said base, so that when the base is removed from the electrolytic bath it is ready to receive the design after the lithographic manner of applying a design to be developed 45 into a printing-surface and to cooperate with the other parts of the press without the necessity of resorting to any finishing operation, such as turning, grinding, sand-blasting, polishing, &c. 50

I am aware that it is not new to form a coating by electrodeposition upon an underlying base; but as far as I am aware no surface adapted for use as a printing, drawing, transferring, or engraving surface has ever been 55 made by electrodeposition upon a base the surface of which has been painstakingly prepared of the same smoothness and finish as that required in the completed printing or 60 drawing or other surface.

I am aware that attempts have heretofore been made to use zinc surfaces for lithographic purposes. Such attempts, however, have not been practicable or commercially 65 successful. The surface of the zinc, which is usually rolled or pressed, is too hard and im-

pure and not sufficiently porous for lithographic printing, and even with such surfaces it is necessary before they can be used at all to prepare them by sand-blasting or some 70 similar operation. Such a treatment merely leaves a thin skin or layer of zinc on the surface which is not at all fitted for the purpose desired, the rest of the zinc being wholly unfitted for lithographic purposes. My improved zinc surface needs no subsequent 75 treatment after it has been electrolytically deposited, and the surface gives excellent results in practice when used as a lithographic surface. Its surface is porous and has a fineness and evenness of grain and texture and 80 uniformity and perfection of finish admirably adapting it for lithographic uses. None of the impurities in the metal constituting the anode reach the base or are deposited thereon. 85 They remain in the bath.

For purposes of convenience in this specification and in the claims I shall refer to the electrolytic bath as composed of three members—the cathode, the anode, and the electrolytic fluid. In my invention I change the 90 relative position of one or more members of the bath to any other member or members thereof during the plating operation and preferably do this continuously and slowly during 95 the electrolytic operation. In practice I accomplish this preferably by moving the cathode. The particular movement described in the means illustrated in the drawing consists of the rotary movement of the base. It 100 is not essential to my invention, however, that this member of the electrolytic bath move rather than that any other member or members of the bath move. By thus changing the 105 relative positions of the different members of the bath I substantially equalize the conditions to which the different parts of the surface of the cathode are subjected in the electrolytic operation, and as a result I obtain 110 an even and uniform deposit upon the base over its entire surface. Each part of the cathode is moved through the same cycle of positions relative to the anode and electrolytic fluid that each other part of the cathode is moved 115 through.

By making the exterior surface of the base smooth and of substantially as perfect a shape and finish as that desired in the completed surface to be used for printing or other purposes I also tend to equalize the conditions 120 to which the different parts of the cathode are subjected in the electrolytic operation, and I am thus enabled to obtain a completed surface uniform and even, possessing fineness of grain and finish and having the proper 125 texture and porosity.

In using the term "lithographic printing" in the specification and claims herein I include lithographic transferring as well as the ordinary lithographic printing. 130

Many changes and modifications can be made in the means shown herein for carry-

ing out my improved process and in the preferred method of carrying out my improved process without departing from my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. The method of producing a surface adapted for use as a printing or drawing or transferring or engraving surface which consists in constructing a base with a surface of the predetermined size, shape, smoothness and finish required in the completed printing or drawing or transferring or engraving surface, placing the said base as a cathode in an electrolytic bath, electrolytically depositing the desired surface thereon from any suitable anode, and during the operation changing the relative position of any member of the electrolytic bath relative to another member to equalize the conditions to which the different parts of the surface of the cathode are subjected in the electrolytic bath, and maintaining during the operation such conditions as will result in a planographic surface, substantially as described.

2. The method of producing a surface adapted for use as a printing or drawing or transferring or engraving surface which consists in constructing a base with a surface of the smoothness predetermined size, shape and finish required in the completed printing or drawing or transferring or engraving surface, placing the said base as a cathode in an electrolytic bath, electrolytically depositing the desired surface thereon from any suitable anode, and during the operation imparting a uniform movement to the said cathode in the electrolytic fluid, and maintaining during the operation such conditions as will result in a planographic surface, substantially as described.

3. The method of producing a curved surface adapted for use as a curved printing or drawing or transferring or engraving surface which consists in constructing a curved base with a surface of the predetermined size, curvature, shape, smoothness and finish required in the completed curved printing or drawing or transferring or engraving surface, placing the said base as a cathode in an electrolytic bath and electrolytically depositing the desired surface thereon from any suitable anode during the operation turning the said cathode in the electrolytic fluid, and maintaining during the operation such conditions as will result in a planographic surface, substantially as described.

4. The method of producing a surface adapted for use as a printing or drawing or transferring or engraving surface which consists in constructing a base with a surface of the predetermined size, shape, smoothness and finish required in the completed printing or drawing or transferring or engraving surface, placing the said base as a cathode in an electrolytic bath and electrolytically depositing the desired surface thereon from any suitable anode, and maintaining during the operation such conditions as will result in a planographic surface, substantially as described.

5. The method of producing a printing-surface which consists in constructing a base with a surface of the predetermined size, shape, smoothness and finish required in the completed surface, placing the said base as a cathode in an electrolytic bath and electrolytically depositing the desired surface thereon from any suitable anode imparting a design to said completed surface after the lithographic manner and developing the surface into a printing-surface of the character described.

6. The method of producing a lithographic printing-surface which consists in constructing a base with a surface of the predetermined size, shape, smoothness and finish required in the completed surface, placing the said base as a cathode in an electrolytic bath and electrolytically depositing the desired surface thereon from any suitable anode, imparting a design to said completed surface after the lithographic manner and developing the surface into a lithographic printing-surface.

7. The method of producing a printing-surface which consists in constructing a base with a surface of the predetermined size, shape, smoothness and finish required in the completed surface, placing the said base as a cathode in an electrolytic bath and electrolytically depositing the desired surface thereon from any suitable anode, and during the operation maintaining such conditions as will result in a planographic surface, imparting a design to said completed surface after the lithographic manner and developing the surface into a printing-surface of the character desired.

In testimony whereof I affix my signature in the presence of two witnesses.

EDWARD HETT.

Witnesses:

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