UNITED STATES PATENT OFFICE.

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PLANOGRAPHIC PRINTING-SURFACE.

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To all whom it may concern:

Be it known that I, GEORGE R. CORNWALL, a citizen of the United States, residing at Rye, in the county of Westchester and State of New York, have invented an Improvement in Planographic Printing-Surfaces, of which the following is a specification.

My invention relates to surfaces employed in the art of planographic printing, and has for its object the production of an improved planographic printing surface possessing important advantages set forth in the following specification.

Planographic printing surfaces as at present employed are commonly made of rolled metal sheets such as zinc, aluminum, etc., or of a surface consisting of electrolytically deposited metal. The objection to planographic surfaces produced by these two methods is as follows: In the first case, the sheet is prepared from a metal ingot by annealing the ingot and rolling it to the desired thickness, the metal being repeatedly annealed and rolled until the thickness desired has been attained.

Planographic printing plates produced by the above-mentioned process possess the defect that, owing to the repeated rolling operations to which they have been subjected, the metal assumes a dense, compacted, hardened and close texture and a polished surface. This texture and condition of surface is distinctly unfavorable to the conditions required for use in planographic printing, in that the plate or surface does not readily respond to the surfacing operation to which a plate is subjected to bring it in condition to use for planographic printing. Also for the further reason that plates made by the rolling process are likely to have some portions relatively hard and other portions relatively soft. The relatively hard portions resist the means for surfacing the plate while the relatively softer portions are cut away more rapidly. As a consequence the plate has an uneven texture of surface; some portions thus taking and holding the design with greater certainty than other portions. Furthermore, the harder portions are less readily acted upon by the acid used with the gum, on the non-printing parts of the plate, and in consequence these harder portions do not hold the same amount of gum filler as the other portions. These portions therefore have a greater tendency to "tint" in printing.

The objection to a planographic plate made by electrodeposition is that from its comparatively open, granular or porous structure it has a tendency to oxidize, thus increasing the danger of having the non-printing parts of the surface "tint". My invention is directed to the avoidance of the disadvantages inherent in the plates above described and now in use. In order to carry out my invention I take a sheet or plate of metal, such for instance as iron, as a base, and deposit thereon a coating of a suitable metal, such for instance as zinc or any other metal susceptible of planographic use.

The method employed for coating the base metal sheet is as follows: The base metal sheet is first suitably cleaned to free it from oxids, grease or other impurities. The clean plate is then dipped in a bath of molten metal of the character above mentioned, such as zinc, etc. After the base metal has been so coated to the desired thickness the plate is suitably treated as by graining, abrading, etc. to give it a true and uniform surface. The thickness of the coating may be varied by controlling the temperature of the plate at the time of immersion or otherwise varying the relative temperatures of the molten metal and the plate to be coated. The time during which the plate is immersed may also be varied for the same purpose. The surface so produced is found to be of a different character from that exhibited by plates ordinarily used. As compared with the rolled plate it is uncondensed and noncompacted, and as compared with the electrodeposited plate not so porous or granular in structure. These features not only make it more easy of preparation, but also make it more uniformly receptive and retentive of both the design and the gum filler and less apt to oxidize and less apt to "tint" in printing.

Aside from the advantages above-mentioned, a plate of the character herein-described costs much less to produce, both in the amount of planographic material required and in the character of the operations which must be performed to bring the same to condition for use in planographic print-

ing. The amount of the surface metal used is extremely small as compared with the rolling method, since the base metal forms the greater part of the sheet, the coating metal deposited thereon being comparatively very thin.

A further advantage consists in the facility with which plates made according to my invention may be renewed. This is easily accomplished by merely removing the coating metal by proper treatment, such as dissolving with acid, and giving the base sheet a new coating.

While I have mentioned certain specific materials for the base metal and for the coating metal, and have described a specific method of preparing the sheet, it is to be understood that my invention is not limited to the materials and methods herein described.

Other materials and methods of coating may be employed which are suitable to the purposes of my invention, without departing from the spirit and scope thereof, the instances given being only illustrative and not restrictive.

In the claims I have used the term "relative" as signifying that the conditions and characteristics recited therein as possessed by plates made in accordance with my invention are relative to the characteristics exhibited by plates and surfaces ordinarily used.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent is:

1. The herein-described planographic plate, consisting of a galvanized metal support, the galvanized coating of which consists of planographic metal.

2. The process of producing a planographic plate which consists in coating a base or support with fluid or molten planographic metal, without subjecting it to pressure, and allowing said coating to solidify and preparing the said plate for printing planographically.

3. The process of producing a planographic plate which consists in galvanizing a base or support with planographic metal.

4. The process of producing a planographic plate, which consists in galvanizing an iron base or support with planographic metal to produce a non-compacted and relatively soft and non porous coating thereon.

5. The process of producing a planographic plate, which consists in immersing a metallic base or support in fluid or molten planographic metal to coat the support therewith controlling the conditions of temperature during and after immersion so as to produce a non-compacted structure of the planographic metal, and then preparing the said surface for printing planographically.

6. The process of producing a planographic plate which consists in immersing an iron base or support in fluid or molten planographic metal to coat the support therewith and produce thereon a coating of planographic metal in a non-compacted and relatively soft and non porous condition and preparing the surface of the said plate for printing planographically.

7. The process of producing a printing plate which consists in bringing a metallic base in contact with a fluid metal and causing the fluid metal to adhere to the base by molecular adhesion and without being under pressure, so as to secure a coating of the fluid metal as a printing surface upon the base.

8. The process of producing a planographic printing surface which consists in forming a preliminary surface of molten metal, permitting said surface to cool without subjecting it to pressure and then applying a design to said surface.

9. The process of producing a planographic printing surface which consists in forming a preliminary surface of molten metal, permitting said surface to cool without subjecting it to pressure and then graining said surface and applying a design to said surface.

10. The process of producing a planographic printing surface which consists in forming a preliminary surface of molten metal, permitting said surface to cool under normal conditions of temperature and pressure and then applying a design to said surface.

GEORGE R. CORNWALL.

Witnesses:
CECIL H. MOORE,
HENRY C. WORKMAN.