

# UNITED STATES PATENT OFFICE.

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METHOD OF COVERING TEXTILE AND POROUS MATERIALS WITH METAL.

SPECIFICATION forming part of Letters Patent No. 694,946, dated March 11, 1902.

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*To all whom it may concern:*

Be it known that I, JOHN A. DALY, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Methods of Covering Textile and Porous Materials with Metal, of which the following is a specification.

This invention relates to metallizing textile fabrics and other porous articles for the purpose of producing ornamental metallic surfaces and substances. It is especially applicable to the metallization of lace and other ornamental and flexible fabric, and by this process a metallic lace can be produced either rigid or flexible and having very many of the characteristics and much of the appearance of knitted or woven lace or other textiles. A textile fabric is used as a base. A knitted or netted cotton, linen, or other fabric or lace may be used, but cotton is preferred.

A solution made of pyroxylin, celluloid, xylonite, or like compound dissolved in acetate of amyl, camphor, or other solvent is first prepared, or rubber dissolved in chloroform or benzin may be used. This solution is made into a paint or creamy mass by the addition of finely-powdered metal or bronze. The fabric or other porous material is thoroughly saturated with this solution, either by immersion therein or by the application of the solution to the fabric by means of a brush or otherwise. The fabric or material having been saturated with the solution is then partially dried. If a lace or netting, it should be stretched or spread out and the threads or meshes restored to normal or regular position. Excess of the compound may be removed by blowing or by centrifugal action. As pyroxylin gives considerable stiffness to the fabric, it is quite easy to spread out a lace or net to show to good advantage when saturated with such compound. The fabric or flexible textile substance having been covered by a conductor of electricity, consisting of finely-powdered metal, is immersed in a proper chemical solution, and an electroplating attachment is made according to any approved formula. An electrodeposit of copper, nickel, silver, or other metal capable of electrodeposition is then made on the fabric. If the coating or saturation has been properly done, a very even deposit is made, so that the original configuration

of the lace or fabric is substantially preserved. A net can be covered with metal to give the appearance of an ornamental stamped or engraved metallic network, except that the electrodeposited net has much more the appearance of a knitted or woven textile material than has usual metal construction whether stamped or engraved.

The solution of pyroxylin, celluloid, xylonite, or like compound has a base of nitrated cellulose, and it is probable that for the purposes of this invention nitrated cellulose compounds may be utilized in various ways. I describe the invention as I have practiced it, leaving for subsequent investigation the determination of the question as to what constitutes equivalents. The solution having such nitrated cellulose base having been well mixed with the comminuted metal carries the metal with it into the fibers of the material constituting the lace, network, or knitted or netted fabric, and the subsequent electrodeposition of metal on a net or fabric so treated causes the electrodeposited metal to become incorporated with or firmly connected to the metal so enmeshed, producing a compound structure of lacework and metal or fabric and metal quite different from a metallic deposit on the surface of a material which has been covered with black-lead or similar conducting material.

For rigid materials—such as ornamental railings, window and other screens, gates, &c.—a heavy electrometal deposit may be made on the textile base; but where flexibility is desired the fabric is but lightly coated with metal and may then be used as a trimming for garments or as a substitute for bullion, gold or silver lace, &c.

I am aware that it has been proposed to treat articles with a coating of varnish having a finely-divided metal therein, then treat the coated article with a solution of nitrate of silver, and then electrodeposit metal on this silver base. As I do not use nitrate of silver in any form I do not claim such a process as is above indicated.

I am also aware that finely-divided tin has been used with or in place of graphite as an electrical conducting-surface to increase the rapidity of the deposition of a copper film in electrotyping and electroplating. This is not

my process in its entirety, but is only a well-known step which I may employ as part of my method.

What I claim is—

- 5 1. The method of producing metallized fabric of the character described, which consists in saturating the fabric with an adhesive compound having a quantity of comminuted metal embodied therewith, whereby the metal be-  
 10 comes enmeshed with the fabric, drying the fabric with the compound and metal so incorporated, and electrodepositing metal thereon, so that the same becomes adherent to the enmeshed particles of metal in the fabric, sub-  
 15 stantially as described.
2. The method of producing metallized lace and the like which consists in saturating said fabric with a solution composed of a nitro-  
 20 cellulose base, as described, and finely-comminuted metal incorporated therein, then electrically depositing metal directly on said fabric so that the same becomes incorporated and connected to the enmeshed metal, sub-  
 25 stantially as described.
3. A metallized textile fabric having finely-comminuted metal enmeshed in its fibers

along with a nitrated cellulose filling, and having a substantial covering of metal connected to said enmeshed particles, substantially as described. 30

4. The method of producing metallized fabric of the character described, which consists in saturating the fabric with an adhesive compound having comminuted metal contained therein, drying the fabric with the metal and  
 35 compound, and without other addition to the product so prepared, electrodepositing a metal directly thereon, substantially as described.

5. A metallized textile fabric having finely-  
 40 comminuted metal enmeshed in its fibers along with an adhesive filling, and having a substantial covering of metal electrodeposited directly on and adherent to the enmeshed metallic particles, substantially as described. 45

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

JOHN A. DALY.

Witnesses:

LEON LASKI,  
 FRANCIS N. ORLANDO.