

# UNITED STATES PATENT OFFICE.

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## METHOD OF COATING LACE WITH METAL.

No. 844,304.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, JOHN ANDREW DALY, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Method of Coating Lace with Metal, of which the following is a specification.

This invention relates to a method of coating lace or similar knitted, netted, or woven fibrous or textile open-work material with metal.

The object of the invention is to cover or electroplate the finest laces and gauzy fabrics with a metal of uniform thickness.

In the preparation the lace is stretched on a frame, as is the case for many other purposes. I then cover the fibers of the lace with a thin, even coating of shellac. This may be applied with a brush to both faces of the lace. The shellac is thoroughly dried and serves to stiffen the lace. When the stretched lace is dry, the surface is covered with an aqueous solution of nitrate of silver and allowed to partially dry; but before the silver nitrate has thoroughly hardened the surface is again painted or covered by an aqueous solution of sulfid of potassium. The effect of this application of potassium sulfid is to decompose the nitrate of silver, the products of such decomposition being sulfid of silver and nitrate of potassium. The lace is now washed in water, which removes the soluble nitrate of potassium, leaving the lace covered with a coating of sulfid of silver, which is a conductor of electricity. This coating of sulfid of silver is comparatively inert and will not destroy the fiber of the lace by its caustic properties. The lace so prepared is then connected with a number of thin copper wires, which wires lead to or extend through a number of points on the surface of the lace. The object of having a number of such connections is to have the electrodeposit begin in a number of places and spread rapidly, so as to save time and also to give a substantially uniform coating of electrodeposited metal. The lace so coated and wired is then suspended by the wires or otherwise in a plating-bath, and electrical connections are made with the wires and bath, so that an electrodeposit of metal may take place on the surface of the lace, the sulfid of silver serving as a conductor for the electrodeposit. Any metal or alloy capable of electrodeposition may be deposited on the lace in the usual way.

After the wired lace has been in the plating-bath a few minutes it is removed, and the wires are withdrawn from the lace. The lace will now be found to be covered with a thin coating, which is termed a "preliminary" coating of the electrodeposited metal from the bath. The lace is now immersed in an alkaline bath to neutralize any acid remaining. It is then washed. The lace is then spread or stretched out and brushed over on both sides with a scratch-brush to bind the crystalline metal of the deposit more firmly together and to the fibers or threads of the lace. The brushing down with a scratch-brush compacts the metal on the threads, serving to exclude acids during the subsequent treatment. After the metal is compacted by the scratch-brush no further wiring is required than the usual wire or metallic connections such as are usual in electroplating. When so connected and again immersed in a plating-bath, the electrodeposit of metal may be continued to the desired thickness.

When it is desired to retain the lace in flexible condition, the first step of coating the lace with shellac is dispensed with. The nitrate of silver is applied directly to the lace.

Heretofore a conductor has sometimes been made by treatment of lace with nitrate of silver. This material is so caustic that it sometimes destroys the fine fibers or threads of the lace and renders the coarser threads and masses of the lace weak and easily broken, like charred wood. By neutralizing the caustic properties of the nitrate almost immediately this defect is avoided, and the strength of the lace is substantially preserved.

By compacting the metal mechanically, as by the use of a scratch-brush, after the preliminary deposit in the bath, the basic metal is made stronger and finer, and a better finished as well as a stronger article of metalized lace results.

What I claim is—

1. The method of coating lace with metal, which consists in covering the threads of lace with a conductor, then making a preliminary electrodeposit of metal thereon in a plating-bath, then removing from the bath and solidifying this preliminary deposit on the threads by mechanical action, then adding further electrodeposited metal.

2. The method of coating lace with metal,

which consists in treating the lace with a solution of nitrate of silver, then with a solution of sulfid of potassium, thus securing a conducting coating, then depositing a preliminary metallic coating thereon in an electroplating-bath, then removing from the bath, compacting the metal on the lace by mechanical means, and depositing further metal thereon in an electroplating-bath.

3. The method of coating lace with metal which consists in stretching the lace on a frame, covering the threads of the lace with a thin varnish to stiffen the same, then covering the varnished threads with a solution of nitrate of silver, then applying an aqueous solution of sulfid of potassium, then washing with water, then making wire connections with a number of points on the lace, and electrodepositing a metal thereon.

4. The method of covering the threads of lace with metal, which consists in stretching the lace on a frame, then covering the threads or web of lace with an aqueous solution of nitrate of silver, then with an aqueous solution of sulfid of potassium, then washing with water, then making an electrodeposit on the lace in an electroplating-bath.

5. The method of covering lace with metal, which consists in stretching the lace on a frame, securing a conductor on the lace, connecting conducting-wires to the lace at numerous points, and depositing metal on said lace and conductor in an electroplating-bath.

6. The method of coating fibrous lace with

metal, which consists in holding the mesh of the lace extended, covering the threads of the lace by a coating of sulfid of silver, connecting the threads of lace to copper conducting-wires at numerous points, making a preliminary deposit of copper thereon, then removing the conducting-wires and afterward increasing the copper deposit.

7. The method of covering fibrous lace with metal, which consists of holding the mesh of the lace in extended position, developing an electrical conductor on the threads of the lace, connecting the web at numerous points to metallic wire conductors, making a preliminary electrodeposit on the threads of lace, then removing the metallic wire conductors and subsequently electrodepositing additional metal on the lace.

8. The method of coating lace with metal, which consists in holding the mesh of the lace in extended position, securing a conductor on the surface of the lace by covering it first with a solution of nitrate of silver and then with an alkaline reagent, connecting the mesh of the extended lace at various points to conducting-wires of a plating-battery, and electrodepositing metal on the threads of the lace.

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

JOHN ANDREW DALY.

Witnesses:

M. J. LOFT,

CHAS. E. HUNTER.