

UNITED STATES PATENT OFFICE.

EMILE CRUMIÈRE, OF PARIS, FRANCE.

METHOD OF ELIMINATING COPPER FROM COAGULATED CELLULOSE.

No. 904,684.

Specification of Letters Patent.

Patented Nov. 24, 1908.

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To all whom it may concern:

Be it known that I, EMILE CRUMIÈRE, a citizen of the Republic of France, and a resident of Paris, France, have invented certain new and useful Improvements in Methods of Eliminating Copper from Coagulated Cellulose, of which the following is a specification.

In the manufacture of artificial silk, artificial horse-hair, and plastic materials consisting of cellulose, the cellulose is first coagulated from the solution in ammoniacal copper solution by means of a suitable bath. When the cellulose has been coagulated, it is necessary to remove completely the copper existing within it, as otherwise the filament or the like will be spotted, of bad luster, capable of being only imperfectly bleached and badly dyed. In eliminating the copper difficulties arise because the fragile nature of the moist threads as they leave the spinning apparatus generally necessitates the treatment of the threads on bobbins whereon the close layers offer great resistance to the penetration of liquids adapted to remove the copper. Whether the bobbins are stationary or moving, and whether the liquids are stagnant or flowing, the elimination of the copper occurs slowly and defectively, with large consumption of the solvent (generally a dilute acid such as sulfuric acid or acetic acid), which, moreover, carries away with it such copper as it has dissolved thus giving rise to another and important source of expense.

The present invention relates to a method of removing the copper which avoids these objections, for it allows a rapid and complete elimination with a minimum quantity of solvent (such as sulfuric or acetic acid) and an automatic recovery of the copper in the same

operation and in proportion as it is eliminated from the coagulated cellulose.

The new method consists in immersing the thread or material in question in a vat containing a solvent, such as an acid and in passing an electric current through the solvent by means of two appropriate electrodes; the vat may, for instance, serve as the cathode. By the passage of the current the thread of artificial silk or artificial horse-hair, whether on bobbins or in hanks, or the plastic materials consisting of cellulose, colored blue throughout their mass owing to the copper present in various conditions, become decolorized; the copper passes into solution in the liquid, the solvent power of which is increased, and deposits itself on the cathode. The copper is thus eliminated rapidly and completely with a minimum quantity of liquid, and at the same time there is complete recovery of the metal at a small total cost of electrical energy and manual labor.

Having thus described the nature of my said invention and the best means I know of carrying the same into practical effect,

I claim:—

A method of eliminating copper from coagulated cellulose, which method consists in passing an electric current through a solvent in which the coagulated cellulose is immersed, in such a manner as to dissolve the copper and deposit it on a cathode.

In witness whereof I have hereunto signed my name this 1 day of February 1908, in the presence of two subscribing witnesses.

EMILE CRUMIÈRE.

Witnesses:

DEAN B. MASON,
GABRIEL BELLIARD.