No. 792,149. Patented June 13, 1905.

UNITED STATES PATENT OFFICE.

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METHOD OF MAKING ARTIFICIAL SILK.

SPECIFICATION forming part of Letters Patent No. 792,149, dated June 13, 1905.

Application filed October 3, 1902. Serial No. 125,738.

To all whom it may concern:

Be it known that we, HARRY S. MORK, WILLIAM H. WALKER, and ARTHUR D. LITTLE, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Methods of Making Artificial Silk, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

In Letters Patent granted to us, No. 712,200, an artificial silk is described composed of a stable non-explosive compound of or derivative of cellulose, and notably the simple or mixed cellulose esters of the fatty acids—as, for instance, cellulose acetate; and this invention relates to a method by which the artificial silk described in said application may be produced.

In carrying our invention into practice we first dissolve the cellulose ester—as, for instance, cellulose acetate—made according to our Letters Patent No. 709,922 in chloroform or other suitable solvent to which has been added a small quantity of a material of low volatility, such as phenol, cresol, or substances having an equivalent effect. After solution has been effected, to this is added a small quantity of a non-volatile material, such as oleic acid or castor-oil, preferably also dissolved in chloroform. We have found a solution prepared as follows to give satisfactory results: One hundred grams of cellulose acetate are added to a mixture of one thousand grams of chloroform and fifty grams of cresol and the mixture agitated from time to time until a solution of the acetate has been effected. Fifty grams of oleic acid dissolved in two hundred grams of chloroform are then added and the solution carefully filtered. The threads or filaments constituting the artificial silk are produced from this solution by projecting it through fine orifices under any suitable pressure into a coagulating-bath. This bath may be composed of any suitable liquid which will itself rapidly dissolve the chloroform or other solvent of the cellulose ester and cause a coagulation of the solution of the ester into very fine filaments. We have found the paraffin hydrocarbons, such as petroleum naphtha, to be very serviceable for this purpose; also, terpenes, such as turpentine, camphor-oil, &c. The threads which are formed by twisting the fine filaments issuing from the orifices are drawn through the coagulating-bath and wound upon reels, and on said reels or otherwise the threads are held under tension and slowly heated until the volatile materials are practically removed. The finished threads may be dyed in the ordinary manner, or the cellulose ester may be dyed before it is dissolved in the chloroform or other suitable solvent, or the dye may be added to the chloroform solution before it is projected into the coagulating-bath.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The method herein described of making artificial silk which consists in dissolving a cellulose ester, as cellulose acetate, in a solvent composed of a material of high volatility and a material of a low volatility, then adding to the solution a small quantity of a non-volatile material, then projecting the solution through small holes into a coagulating compound.

2. The method herein described of making artificial silk which consists in dissolving a cellulose ester, as cellulose acetate, in a solvent composed of a material of high volatility and a material of a low volatility, then adding to the solution a small quantity of a non-volatile material, then projecting the solution through small holes into a coagulating compound, and then placing the same under tension and drying.

3. The method herein described of making artificial silk which consists in dissolving a cellulose ester, as cellulose acetate, in a solvent composed of a material of high volatility and a material of a low volatility, then adding to the solution a small quantity of a non-volatile material, then adding a dye to the solution, and then projecting the solution through small holes into a coagulating compound.

4. The method herein described of making artificial silk which consists in dissolving a

celloluse ester, as cellulose acetate, in a solvent composed of a material of high volatility and a material of a low volatility, then adding to the solution a small quantity of a non-volatile material, then projecting the solution through small holes into a coagulating compound, then twisting together a plurality of the filaments, then winding and drying the same under tension.

In testimony whereof we have signed our names to this specification in the presence of subscribing witnesses.

HARRY S. MORK.
WILLIAM H. WALKER.
ARTHUR D. LITTLE.

Witnesses:
B. J. NOYES,
L. H. HARRIMAN.