

UNITED STATES PATENT OFFICE

2,166,739

MANUFACTURE OF ARTIFICIAL SILK

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No Drawing. Original application November 16, 1927, Serial No. 233,747. Divided and this application October 13, 1936, Serial No. 105,439. Renewed November 10, 1938. In Germany December 8, 1926

6 Claims. (Cl. 18—54)

This application is a division of my application Serial Number 233,747, filed November 16, 1927.

This invention relates to artificial silk filaments having a dull lustre and to a method for making said filaments.

It has already been proposed for the manufacture of artificial silk of dull lustre, subsequently to impregnate the artificial silk structure, which has been prepared in the usual way, with metal salts, for example barium sulphate, which are difficultly soluble or insoluble in water, in such a manner that the artificial silk is treated successively with aqueous solutions of chemical compounds which by a double chemical reaction yield difficultly soluble or insoluble compounds. The artificial silk of dull lustre obtained in this way has however the disadvantage of an increased specific weight and at the same time a diminished pliability and elasticity.

It has been found that artificial silk filaments having a rich dull lustre, which resembles or is identical with the lustre of natural silk, can be produced by incorporating with the artificial silk filaments difficultly volatile substances, if desired a plurality of such substances in a fine state of subdivision, for instance in such a manner that these substances are distributed in an emulsion-like, suspension-like or colloidal form in the spinning solutions, and these are then worked up according to the usual methods to form filaments. Under difficultly volatile substances are also to be understood substances which are practically non-volatile or generally considered as non-volatile. Such substances may be for example mineral, vegetable or animal oils, fats or waxes, fatty acids, aniline, tetralin, nitro-benzene and the like, and the spinning solutions may be for instance viscose, ammoniacal copper oxide, nitro-cellulose or cellulose acetate solutions. The substances to be incorporated should be so chosen for the different spinning solutions that they do not dissolve molecularly in the spinning solutions, but are merely distributed in the same after the manner of an emulsion or colloid. Solid substances such as for example thorium oxide, magnesium soaps, calcium naphthenate and the like, which are insoluble or difficultly soluble in the spinning solutions may however also be incorporated in a finely suspended or colloidal form with the spinning solutions.

The fine distribution of the added substances in the spinning solution can be obtained for example by preparing these substances beforehand in a very fine state of subdivision or in the form of colloidal solutions and thereupon mixing them

with the spinning solutions; however it may also be obtained by purely mechanical means directly in the spinning solutions themselves, for instance by using mixing apparatus, or distributing apparatus. The incorporated substances should preferably be distributed in such manner that, the smaller the diameter of the artificial silk filament to be spun, the finer are the distributed particles. For the usual kinds of artificial silk, particles of the size of 0.001 to 0.005 mm. are satisfactory. When distributing apparatus having a more intensive action, for instance homogenizing apparatus or emulsifying apparatus are used, it is possible if desired to obtain an even finer distribution of the substances to be incorporated, if necessary up to colloidal dimensions. Mixtures of difficultly volatile with volatile substances, for example paraffine oil and benzene, are also suitable for the present process.

The substances may also be incorporated during the process for the production of the spinning solutions, that is to say the substances need not only be distributed in the finished spinning solutions, but they can be successfully distributed beforehand, for instance at the same time as the cellulose compounds are dissolved in their solvents.

The incorporated substances are present in the finished artificial silk structures in the form of microscopic or sub-microscopic drops or granules and give the artificial silk structure a lustre similar to that of natural silk and the textiles made therefrom are extremely pliable and elastic.

According to one mode of carrying out the invention the method adopted is such that the incorporated substances are subsequently partly removed again, by which means it is possible at the same time to obtain the so-called hollow filaments. This partial elimination can be obtained for instance by treating with suitable solvents for example organic solvents. It can also be effected for example by removing a part of the incorporated substances as by heating, if desired, in a vacuum. By this method it is also possible partially to remove more difficultly volatile substances from the filaments again. These artificial silk structures also have a lustre similar to that of natural silk and are characterised by a pleasant soft feel.

Examples

1. 1000 g. viscose, in which 5 g. paraffine oil or linseed oil or mixture of paraffine oil or linseed oil and small amounts of benzene have been finely distributed by means of a butter churn, is spun in

a known manner in precipitating baths, which contain sulphuric acid and sodium sulphate, and the resulting artificial silk filaments washed and dried in the usual way. An artificial silk filament is obtained, which contains tiny drops of oil, distributed very finely and evenly therein, this filament having a rich dull lustre.

2. 150 g. of sodium cellulose prepared and ripened in the usual manner are treated in a known way with 18-26 g. carbon disulphide, 3 g. aniline or paraffine oil then added and after thorough mixing in a kneading apparatus in a known manner dissolved in soda lye, so that a viscose is obtained containing 7-8% caustic soda and 7-8% cellulose. This spinning solution is spun into filaments as in Example 1, which filaments are then washed, dried and thereupon treated with benzene while being heated, until about $\frac{1}{5}$ of the incorporated aniline or paraffine oil is extracted from the artificial silk filaments. After evaporating the benzene, artificial silk filaments having dull lustre are obtained which are particularly soft and pliable.

What I claim is:

1. In the preparation of artificial silk, the step of preparing a highly dispersed suspension of thorium oxide thoroughly mixing such suspension with the spinning solution and spinning the artificial silk.
2. In the preparation of artificial silk, the step

of preparing a mixture of a thorium oxide in a medium in which it is insoluble, said thorium oxide being in a highly dispersed state in the said medium, thoroughly mixing said dispersed system with the spinning solution and spinning the artificial silk.

3. An artificial silk filament having a lustre resembling that of natural silk and containing finely divided, dispersed undissolved particles of thorium oxide.

4. An artificial silk filament having a lustre resembling that of natural silk and containing finely divided, dispersed undissolved particles of thorium oxide, said filament having void spaces therein.

5. An artificial silk filament having a lustre resembling that of natural silk and containing finely divided, dispersed undissolved particles of thorium oxide, said filament having a pitted surface resulting from the removal of material dispersed throughout the filament.

6. A spinning solution for use in the manufacture of delustered artificial silk filaments and the like, comprising a cellulosic solution to which has been added thorium oxide, said thorium oxide having been first prepared in a fine state of subdivision by suspending the same prior to incorporation in the spinning solution.

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