

UNITED STATES PATENT OFFICE.

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PROCESS FOR THE MANUFACTURE OF ARTIFICIAL SILK FILAMENTS FROM NITROCELLULOSE.

No. 866,768.

Specification of Letters Patent.

Patented Sept. 24, 1907.

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To all whom it may concern:

Be it known that I, CHARLES BOTTLER, a subject of the German Emperor, and a resident of Jülich, Germany, have invented a certain new and useful Improved Process for the Manufacture of Artificial Silk Filaments from Nitrocellulose, and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to the art of manufacturing so-called artificial silk or artificial silk filaments from nitrocellulose is comparatively new and of late years particularly has been in a state of active development. An important point or progressive knowledge forming a part of the observations necessary in considering such manufacture consists in the observation or determination of at what moisture contents the nitrocellulose which serves as the starting or base material can be most advantageously brought into solution with the view of producing therefrom as perfect an artificial silk as possible. The investigations made in this domain have found their expression in a number of Letters Patent and applications for Letters Patent each of which has had for object to obtain protection for the use in the manufacture under notice of nitrocellulose containing a definite percentage of water. In this connection are concerned the following:—1. The specification accompanying an application for Letters Patent in Germany made by J. Douge, of Besancon France, No. D.11841, Class 29b, describing the use of nitrocellulose having from 6% to 10% water content. 2. The specification accompanying an application for Letters Patent in Germany made by Johann Stoerck, of Brussels, Belgium, No. St.7903, Class 29b, describing the use of nitrocellulose having from 12% to 20% water content. 3. The specification of German Letters Patent granted to Hilaire de Chardonnet, of Paris, France, No. 81599, describing the use of nitrocellulose having from 25% to 30% water content. 4. The specification accompanying an application for Letters Patent in Germany made by Gustav Dietl, of Berlin, Germany, No. D.14651 IV/29b describing the use of nitrocellulose having from 33% to 38% water content.

It is now found that the zone of moisture content of the nitrocellulose which is technically of greatest advantage both in respect of the attainment of the quick-

est and clearest solution possible in the known solvents, as well as in respect of the further working up of the colloid solution obtained in this way and of the final product thereby obtained into artificial silk, lies between 20 and 25 per cent.

Departing from the methods described in the specifications hereinbefore mentioned, it is found disadvantageous to carry out drying by presses, in a current of air or by heat, as is necessary where the water content is below 20%. It is also found that by a single whirling in a centrifugal machine the water content of the nitrated cotton coming from the washing machines can only be reduced down to a water content of about 25%, so in carrying out the improved method, while observing the rules laid down by practice, the once whirled nitrated cotton is introduced in small portions into a second and thence into a third and if necessary into a fourth centrifugal machine and in this way, by keeping time accurately to seconds, a regular abatement of the water content within the limits of a few per cent. is successfully obtained. The nitrated cotton prepared in this careful way and in contradistinction to previous experience and observation can in all cases be brought to an easy and clear solution which filters excellently well. The solution takes place in closed vessels in the proportion of 18 to 23 kilos, dry weight, of nitrated cotton to 100 liters of solvent, consisting of a mixture of alcohol and ether in the proportions of 3:2 or 1:1; this is however only an example. Other relative proportions of weight and measurement, as well as mixtures of other known solvents such as methyl alcohol, acetone etc., may however be employed.

The most important advantage however of the colloid solution prepared from a nitrocellulose with a water content of 21 to 24 per cent. consists in addition to the advantages stated in its capability of being easily and regularly spun and its simplified denitration in the obtaining of a final product which is characterized by special strength of filament and increased brilliancy especially in a dyed condition.

What I claim is:—

1. The herein described process for the manufacture of artificial silk which consists in treating nitrocellulose to reduce the water content thereof to from 21 to 24 per cent. and adding a solvent thereto to form a colloid solution.
2. The herein described process for the manufacture of artificial silk, which consists in subjecting a nitrocellulose to centrifugal action to reduce the water content thereof to from 21 to 24 per cent, and in subsequently forming a

collodion solution by dissolving said nitrocellulose in a mixture of alcohol and ether or the like.

3. The herein described process for the manufacture of artificial silk which consists in subjecting nitrocellulose to centrifugal action to reduce the water content thereof, to from 21 to 24 per cent, and in mixing the same with a solvent to form a collodion in the approximate proportion of 18-23 kilos of said nitrocellulose to 100 liters of the solvent.

4. The herein described process for the manufacture of

artificial silk which consists in reducing the water content of nitrocellulose by subjecting the same to successive centrifugal actions for predetermined intervals of time.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CHARLES BOTTLER.

Witnesses:

BESSIE L. DUNLAP,
LOUIS VAMDORY.