

UNITED STATES PATENT OFFICE

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PRODUCTION OF ARTIFICIAL FILAMENTS

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7 Claims. (Cl. 18—54)

This invention relates to the production of artificial silk or the like from viscose solution and more particularly to an improved process for such production.

6 In the production of artificial filaments and similar tissues from viscose solution the usual procedure is to cause the artificial tissue to separate out in an acid liquid and then the tissue, for example the artificial filament, is led to a winding device. The wound spools are strongly saturated with acid liquid and in order to remove this dangerous substance they must be subjected to a long and inconvenient washing process. The spools are then dried, and the silk 10 twisted and brought into skein or hank form. The hanks thus obtained are finally desulphurized, bleached, washed and prepared.

15 In some cases in order to remove the greater part of the acid adhering to the spools previously to washing the spools the winding up devices are caused to rotate in a warm water bath. This step, however, only produces a partial removal of the acid liquid. A further suggestion is to neutralize the acid used in connection with the 20 formation of the filament by suitable treatment such as salt forming and to spool the salt-containing silk.

One object of the invention is to obtain an improved washing of the filaments.

30 Another object of the invention is to increase the strength of or in other words to sthenosize the filaments without increasing the number of steps of the process.

35 In accordance with the present process the acid parts and the salts are removed directly following the precipitating process in a hot water bath and immediately after removal of the artificial filaments from this bath the tissues are run on winding devices.

40 The process may for example be carried out in the following manner. The filament bundle passing out of the acid precipitating liquid is immediately drawn through a hot flowing water bath at about 70° C., and extending for about 45 50 centimetres and immediately following is wound up on a spool rotating outside this bath but which may also rotate in a treating liquid. The filaments thus spooled are free from acid and salts and can be subjected to further treatment without any additional washing.

50 The advantage of the new process as compared with those previously adopted is that it provides a considerable saving of labor. The action of the hot aqueous liquid and the removal 55 of the acids, salts and gaseous products of de-

composition directly after the precipitating and fixing process causes sthenosizing of the product as a longer period of action of these substances unfavorably influences the product especially in the case of an artificial filament.

5 If desired, additional sthenosizing of the product may be provided by adding to the hot washing liquid organic substances such as formalin or the like.

10 The process of the invention carried out in the above described manner provides a considerable increase in the strength of the artificial filament or the like if the filaments on passing through the hot water bath are simultaneously subjected to strong tension. This may be effected for example by leading the artificial filaments 15 or the like over rollers or other suitable guides which subject the filaments to tension by extending the path thereof and increasing the resistance to friction.

20 Extending the artificial filaments is not novel, per se, but in known processes this step is, however, completed in the first precipitating bath at which stage the filament is of a quite soft and elastic character and the primary object of such 25 a step is to draw out the filaments to a greater fineness.

30 In contradistinction thereto in accordance with the new process, the filament which is already considerably hardened is subjected to tension when under the action of the hot aqueous liquid with the result that no important reduction of its cross section takes place. The strength of the filament is, however, considerably increased probably due to the displacement and 35 parallel positioning of the small cellulose particles (micelle).

What I claim is:—

40 1. A process of the type herein described for producing artificial filaments or the like from viscose solution which consists in forming the filaments in an acid coagulating bath, leading the unwound filaments directly through a hot water bath after coagulation and subsequently immediately spooling said filaments.

45 2. A process of the type herein described for producing artificial filaments or the like from viscose solution which consists in forming the filaments in an acid coagulating bath, leading the unwound filaments directly through a hot water bath after coagulation, simultaneously sthenosizing said filaments and subsequently spooling said filaments.

50 3. A process of the type herein described for 55

producing artificial filaments or the like from viscose solution which consists in forming said filaments in an acid coagulating bath, leading unwound coagulated filaments directly after coagulation through a hot water bath containing formalin as a sthenosizing agent and subsequently spooling said filaments.

4. A process of the type herein described for producing artificial filaments or the like from viscose solution consisting in forming said filaments in an acid coagulating bath, passing said unwound filaments directly after coagulation through a hot water bath, subjecting said filaments on their passage through said water to a tensioning action and subsequently spooling said filaments.

5. That step in the process of producing artificial filaments or the like from viscose solution by coagulation of said filaments in an acid precipitating bath and by subsequent spooling of said filaments which consists in immersing the coagulated filaments in a hot water bath in direct

sequence after coagulation and prior to spooling said filaments.

6. That improvement in the process of producing artificial filaments or the like from viscose solution by coagulation of said filaments in an acid precipitating bath and by subsequent spooling of said filaments which consists in immersing the coagulated filaments in a hot water bath in direct sequence after precipitation and prior to spooling said filaments, and sthenosizing said filaments during said hot water washing.

7. That improvement in the process of producing formed artificial filaments from viscose solution by coagulation in an acid precipitating bath and by subsequent spooling of said filaments which consists in immersing said coagulating filaments in a hot water bath in direct sequence after coagulation and prior to spooling said filaments and submitting said filaments to a tensioning action during immersion in said hot water.

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