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# UNITED STATES PATENT OFFICE

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## PRODUCTION OF ARTIFICIAL FILAMENTS, THREADS, RIBBONS, FILMS, AND THE LIKE

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10 Claims.

(Cl. 18—54)

This invention relates to the manufacture of filaments, threads, ribbons, films, sheets or other products from viscose.

In prior U. S. Patent No. 1,465,994 processes are described for the manufacture of filaments and films by extruding solutions of cellulose acetate into aqueous solutions of thiocyanates, for example ammonium, sodium or calcium thiocyanate.

10 I have now found that such coagulating agents are advantageous in the case of the formation of filaments or other products of regenerated cellulose.

15 As in U. S. Patent No. 1,465,994 the process permits of the production of filaments or other products of very fine denier or relatively small cross-section.

20 The concentration of thiocyanate in the coagulating liquids may be varied with the particular thiocyanate employed, with the concentration of the spinning solution and with the particular denier or cross-section of the products being produced. For example, in spinning with relatively large jet orifices higher concentrations of thiocyanate may be employed than with smaller jet orifices. At the same time the use of relatively concentrated solutions of thiocyanates enables the products to be drawn 25 out to fine deniers or low cross-sections.

30 Any desired additions may be made to the coagulating liquids for the purpose of assisting or increasing the regeneration of the cellulose. For example, acids, acid salts or salts, e. g. sulphuric acid, acid sulphates or neutral sulphates or sulphites, may be added thereto. Alternatively the products after coagulation by means of aqueous thiocyanate solutions may be treated with aqueous solutions of acids, acid salts, or salts. Where desirable the coagulation or 35 regeneration may be rendered more uniform throughout the products by the addition of organic substances such as glycerin, sugars or wetting agents.

40 As indicated above a stretch may be applied to the materials during coagulation so as to draw them out to the required denier or cross-section. Alternatively or in addition a stretch may be applied thereto after coagulation and during 45 or after regeneration of the cellulose (where a subsequent treatment is applied for this purpose); for instance filaments may be carried in succession round two or more feed rollers having successively increasing peripheral speeds.

50 55 The following example shows the best method

known to me for carrying the invention into effect, but it is not to be regarded as limiting it in any way:—

### Example

A normal viscose, or a viscose obtained from unmatured alkali cellulose or from alkali cellulose which has been matured for a relatively short time, for example 18—30 hours, and in which the viscose has been allowed to stand for about 70—80 hours at 17° C., is spun through a nozzle having spinning apertures of 0.08 millimetre diameter into an aqueous coagulating bath containing 6—8% of concentrated sulphuric acid, 20—30% of sodium thiocyanate, 1% of zinc sulphate, and 10% of glucose, the bath being maintained at a temperature of about 10° C., and the length of immersion of the filaments being 16—20 inches. The yarn is carried out of the coagulating bath and wound on a bobbin running in water, or sprayed with water, and rotating at a peripheral speed of 40—60 metres per minute; this speed is 1.5—3 or even 5 times the rate of extrusion of the spinning solution from the nozzle. The yarn may be further washed and dried as desired.

What I claim and desire to secure by Letters Patent is:—

1. Process for the manufacture of filaments, threads, ribbons, films or other products from viscose, comprising spinning viscose into an aqueous coagulating bath containing a thiocyanate.

2. Process according to claim 1, wherein the thiocyanate used is that of sodium.

3. Process for the manufacture of filaments, threads, ribbons, films or other products from viscose, which comprises spinning viscose into an aqueous coagulating bath containing a thiocyanate in a concentration of at least 20%.

4. Process for the manufacture of filaments, threads, ribbons, films or other products from viscose, which comprises spinning viscose into an aqueous coagulating bath containing sodium thiocyanate in a concentration of 20 to 30%.

5. Process for the manufacture of filaments, threads, ribbons, films or other products from viscose, comprising spinning viscose into an aqueous coagulating bath containing a thiocyanate and a compound having the formula  $H_aX_bR_c$  where H is hydrogen, X is a metal, R is an acid radicle and a, b, and c are integers of which either a or b may be zero.

6. Process for the manufacture of filaments, threads, ribbons, films or other products from

viscose, comprising spinning viscose into an aqueous coagulating bath containing a thiocyanate and a compound selected from the group consisting of glycerine and sugars.

5. Process for the manufacture of filaments, threads, ribbons, films or other products from viscose, comprising spinning viscose into an aqueous coagulating bath containing a thiocyanate and a wetting agent.

10. Process for the manufacture of filaments, threads, ribbons, films or other products from viscose, comprising spinning viscose into an aqueous coagulating bath containing a thiocyanate, and subjecting the product to a stretching operation.

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9. Process for the manufacture of filaments, threads, ribbons, films or other products from viscose, which comprises spinning viscose into an aqueous coagulating bath containing a thiocyanate and then treating the formed materials to regenerate the cellulose.

10. Process for the manufacture of filaments, threads, ribbons, films or other products from viscose, which comprises spinning viscose into an aqueous coagulating bath containing a thiocyanate, subjecting the product to a stretching operation and then treating the formed materials to regenerate the cellulose.

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