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TREATMENT OF FIBROUS MATERIAL OF
VEGETABLE ORIGIN

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This invention relates to the treatment of fibrous material of vegetable origin including both natural fibres and artificial fibres.

I have found that fibres which due to their lightness, short length, the effects of static electricity, or other reasons are ordinarily difficult to spin are rendered readily spinnable by my process, and at the same time may be given a wool-like appearance. The tendency of the fibres to shed from yarn made up wholly or in part from the treated fibres, or from the fabric made up therefrom is minimized.

The term "vegetable fibres" as used herein includes all natural vegetable fibrous material such, for example, as kapok and milk-weed, and artificial fibres made up from vegetable matter such, for example, as cellulose compounds.

By my invention I am able to substantially eliminate the difficulties heretofore experienced due to "flying" and the effects of static electricity, not only temporarily but permanently, so that the fibres may be stored and used at a later time without further treatment, or the processing operations may be stopped as often as desired and need not be hurried.

In carrying out my invention, I modify the form and character of the fibres by inducing kinks, curls or sharp bends in them, and further reducing their freedom of slip by endowing them with a friction increasing material, thereby changing their frictional and electrical properties and their weight, and causing them to more readily engage and remain interengaged with other fibres, either of the same, or of a different kind. I may also deluster the fibres obtaining a product which, while varying greatly according to the shape and character of the fibre treated, will have what may be described in general terms as a wool-like appearance.

I prefer to modify the form of the fibres and deposit thereon an adherent material, in a single step. The form of the fibres may however be artificially modified by suitable means in one step, and an adherent material deposited on the fibres in a separate step.

While for the purposes of a full disclosure I have set forth herein a specific way of carrying out my invention, the proportions of the ingredients named, or their equivalents, may be considerably varied without departing from the scope of my invention which is defined in the claims appended hereto.

In carrying out my preferred treatment I immerse the fibres in a solution of sodium sulpho-cyanide, or other salt capable of modifying the form of the fibres, and an albuminate body in an alkaline medium, preferably a colloidal substance such as soap, which causes the fibres to be coated and weighted, and modified in form by the development of kinks, curls, or sharp bends.

I prefer to combine the sodium sulpho-cyanide and the albuminate body in the same bath as I have found that besides economy of time and effort the combined treatment results in a definitely improved quality of treated fibre. I find that the sulpho-cyanide increases the degree to which the fibre is impregnated by the adherent material, either by reason of its salting out effect on the alkali-sericine which exists in true solution, or its usefulness as an electrolyte in limiting the dispersion of the sericine in the water or the soap solution and favorably changing its distribution between the liquid and the fibre phase.

As an example of an albuminate body which will give good results I will mention sericine as in "boiled off liquor", which contains a high percentage of sericine or silk gum and which is more available commercially than pure sericine. In solution sericine is attached by soda or soap forming sodium-sericine which is readily combined with and deposited upon the fibres.

The exact amount of the various ingredients used may be varied according to the strength, size and character of the particular fibre being treated. Though I in no way limit myself to these percentages I have found that in treating cellulose acetate good results may be obtained by soaking the fibres in a solution comprising 4 per cent of sulpho-cyanide and 1 per cent of "boiled off liquor"; (from approximately 20 to 40 per cent of sulpho-cyanide and from 5 to 50 per cent of "boiled off liquor" based on the weight of the stock being treated). The per cent of "boiled off liquor" will depend upon the concentration which varies widely in the commercial product.

The "boiled off liquor" contains a varying percentage of soap in a colloidal state which modifies the degree to which the sericine is deposited from solution onto the fibres. Any suitable alkaline medium may be employed, with or in place of the soap, to facilitate the use of the adherent material.

An example of a substitute for the "boiled off liquor" as the adherent material is a gelatin solution made up substantially as follows:

Soap	-----lbs.	15
Gelatin	-----oz.	5
Olive oil	-----oz.	1.5
Salt	-----oz.	1.5
Water	-----gals.	5

The gelatin solution may be used in an amount approximately 15 per cent of the total solution, or from .6 to 5 per cent of the weight of the fibre stock being treated depending on the gelatin content.

The fibre stock may be treated in either of the above solutions for approximately 30 minutes at

a temperature of approximately 180° F. at the beginning of the period.

To increase the delustering effect the per cent of sulpho-cyanide may be increased.

The delustering effect may also be increased by immersing the fibres in a preliminary bath comprising from 2 to 4 per cent of triethanolamine and 1 per cent of trichlorethylene and water in approximately 5 times the weight of the stock.

The temperature of this bath may be initially from 170° to 180° F. and the stock may be soaked therein for 10-30 minutes.

Instead of the preliminary bath of triethanolamine and trichlorethylene the fibres may be delustered by being initially treated in a solution containing 7 per cent of soap based on the weight of the fur stock, the stock being treated therein for from 20 minutes to an hour, the bath being heated initially to 180° to 210° F. From .1 to .25 of one per cent of phenol may be added to increase the delustering effect.

When treating fibre having a very low specific gravity it is desirable to increase the proportion of water to the weight of the stock. For example, in treating kapok I have found it desirable to use an amount of water which is approximately 12½ times the weight of the stock.

Fibre treated by my process may be given a wool-like appearance. A great variety of effects may be produced, especially with artificial fibres, due to the various shapes into which these fibres can be formed. For instance, if the fibre is made ribbon-like in cross section a mass of the fibre after treatment, or the yarn made up therefrom, will vary considerably in appearance from such fibre formed with a substantially circular cross section.

The treated fibre has the great advantage that "flying" and the effects of static electricity are reduced to a minimum during the steps of spinning and otherwise processing the fibres and if yarn made up wholly or in part of the treated fibres is properly spun the tendency of the fibres to shed from the yarn or from fabric made up therewith is greatly reduced.

What I claim is:

1. Method of treating fibres of the kind described herein for spinning into a yarn with fibres of the same or different kind, which comprises treating the fibres with a solution of sulpho-cyanide, olive oil, gelatin, salt and water.

2. Method of treating fibres of the kind described herein for spinning into a yarn with fibres of the same or different kind, which comprises treating the fibres prior to spinning with a solution of olive oil, gelatin, salt and water.

3. The method of making artificial wool which comprises artificially modifying the form of vegetable fibers and thereafter treating the vegetable fibers in a solution of trichlorethylene and triethanolamine and then in a gelatin solution of a strength of .6 to 5%, based on the weight, of the fiber stock being treated.

4. The method of making artificial wool which comprises artificially modifying the form of vegetable fibers and thereafter treating the vegetable fibers in a solution of gelatin in a strength of from .6 to 5% of the weight of the stock being treated.

5. The method of making artificial wool from fibers of vegetable origin which comprises artificially modifying the form of vegetable fibers and thereafter treating the fibers in a solution comprising gelatin, olive oil, salt and water.

6. The method of making artificial wool which comprises soaking cellulose acetate fibers in a solution comprising approximately 4% of sulpho-cyanide and 1% of boiled off liquor.

7. The method of making artificial wool which comprises soaking cellulose acetate fibers in a solution of from 20 to 40% of sulpho-cyanide and 5 to 50% of boiled off liquor, based on the weight of the stock being treated, for approximately 30 minutes at a temperature of 180° F.

8. The method of making artificial wool which comprises soaking the fibers in a solution comprising approximately 20 to 40% of sulpho-cyanide and a solution of from .6 to 5%, based on the weight of the fiber being treated, comprising soap, gelatin, salt and water.

9. The product having artificially curled vegetable fibers having a deposit thereon comprising sulpho-cyanide, olive oil, gelatin, salt and water.

10. Spun yarn containing short vegetable fibers rendered more spinnable by a deposit thereon prior to spinning comprising olive oil, gelatin, salt and water.

11. The product consisting of short vegetable fibers rendered more spinnable by a deposit thereon prior to spinning comprising olive oil, gelatin, salt and water.

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