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PROCESS FOR THE MANUFACTURE OF ARTIFICIAL SILK

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In the manufacture of artificial silk by the wet process, a more or less swollen yarn of hydrated cellulose is obtained which retains substantially its water of imbibition, even after passing through the washing and other treating baths. If such highly swollen threads, filled with imbibed water, are subjected to a first drying, it will be observed that superimposed threads tend to stick together. Yarn bodies of artificial silk, manufactured and dried in the aforementioned manner, can be only unwound with great difficulty, and sometimes it becomes impossible to unwind them at all. In any event, in this process the fibres are damaged and fuzz is formed. In order to avoid these drawbacks, it has heretofore been proposed to treat the freshly spun and washed yarn bodies, before drying, with a more or less heated soap solution and subsequently to dry them. The yarn, thus, loses its water of imbibition during the first drying, this step terminating the coagulation of the plastic thread to cellulose. In the aforementioned process, the soap solution is able to penetrate the cellulose thread to some extent, and, thus, to prevent tackiness of the single fibres by surrounding them like an insulating coating.

Recently it has been recognized that, due to peculiar characteristics of the soap used, the treated and dried yarn bodies of artificial silk stick again together to a certain degree during drying. This tackiness of the products is not due to a sticking together of the cellulosic yarns per se but to a considerable incrustation of the yarn bodies caused by soap adhering thereto. For this reason, it has been necessary to submit the yarn bodies, treated and dried in this manner, to a second washing and drying. After this second washing and drying the yarn bodies could be satisfactorily unwound. The processes, set forth above, were especially applied to products of hydrated cellulose, formed from cuprammonium cellulose solutions, by the so-called stretch-spinning process. In this process, the first drying caused the formation of streaky, irregular products. It is just in the case of cuprammonium silk that the danger of sticking is particularly great since this variety of artificial silk tends to swell to a particularly great degree, but the danger may also arise in the case of viscose artificial silk insofar as the artificial silk is spun in salt-free baths, e. g. pure acid baths, since here there is no opportunity for any considerable osmotic deswelling of the filament.

I have found, by experimentation, that the process of double wet treatment and double drying can be shortened and rendered more economical, and that the artificial silk yarn bodies can receive a single wet treatment with a subsequent single drying in such a manner that they may be unwound without formation of fuzz.

In accordance with my novel process, it is necessary to pass the wet-treated and washed yarn bodies before the first and only drying through oil and fat emulsions, these emulsions being heated above 70° C., i. e., somewhat below the boiling point of the emulsions. During the treatment the oil and fat seem to penetrate considerably the interior of the cellulosic products. At any rate, after the first drying an extremely soft artificial silk fibre is obtained. The oils and fats surround the cellulose fibre in a similar, yet better manner and prevent tackiness during the subsequent drying thereof. However, it is to be noted that no incrustation of the yarn bodies occurs during drying, for the reason that the fats and oils do not form incrustations and allow the unwinding of the threads from the yarn bodies after the drying thereof. Although it is preferable to use such oils and fats which do not produce incrustations at all during drying, I wish to emphasize that any mineral oil or fat, vegetable oil or fat and animal oil or fat may be employed for the purpose set forth above. It is also to be noted that any type of cellulosic yarn, such as viscose, cuprammonium cellulose, cellulose ethers and esters, etc. may be treated with my oil or fat emulsions. Soaps on the other hand are very inferior for use in the present invention, since, irrespective of whether they are used hot or cold, they tend to form crusts. The following example will serve to illustrate the working principle of my invention.

Example

Freshly spun, decopped cuprammonium cellulose yarn in skein form is thoroughly washed and immersed for about 30 minutes in an aqueous emulsion of olive oil containing about 1.5% of olive oil. The temperature of the oil emulsion is maintained during the treatment at about 90° C. The skeins, treated in this manner, are centrifuged and dried in conventional manner. These skeins may be unwound without trouble and used in the production of textiles. Depending upon the thickness of the material under treatment and the degree of swelling of the hydrated cellulose, this oil treatment may be shortened or prolonged, in other words, the treatment need not be exactly 30 minutes. In addition, the concentration of the emulsions may be varied at will. In order to facilitate the emulsi-

fications of oils and fats in water, I may use well known emulsifying agents. Before immersing the yarn bodies in the oil or fat emulsions, special preparations may be applied thereto, such as wetting agents and "soromin", this latter preparation being manufactured by I. G. Farbenindustrie which is described in British patent specification No. 337,737.

Modifications of my process will be readily recognized by those skilled in the art, and I desire to include all modifications falling within the scope of the appended claims.

I claim :

1. In the method of removing the tackiness of freshly spun yarn bodies of hydrated cuprammonium cellulose, the step comprising treating the yarn bodies of cuprammonium cellulose at a temperature above 70° C. with an aqueous emulsion of a substance of the group consisting of fats and oils.

2. In the method of removing the tackiness of freshly spun yarn bodies of hydrated cuprammonium cellulose, the step comprising treating the yarn bodies of cuprammonium cellulose at a temperature above 70° C. with an aqueous emulsion of olive oil.

3. In the method of removing the tackiness of freshly spun yarn bodies of hydrated cuprammonium cellulose, the step comprising treating the yarn bodies of cuprammonium cellulose at a temperature of about 90° C. for about 30 minutes with an aqueous emulsion of olive oil, said emulsion containing about 1.5 per cent of olive oil.

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