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METHOD FOR TREATING ARTIFICIAL SILK OBTAINED FROM CENTRIFUGES

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In the manufacture of artificial silk and particularly viscose silk, by the centrifugal process, the method of procedure which has hitherto been adopted has been to transfer the threads spun into the spinning pot, in the form of a so called "cake", to a reeling machine where it is wound into hanks, the hanks so obtained are washed, subjected to centrifugal hydro-extraction and dried, preferably on a stretching carriage. As the result of this method the hanks always leave the drying oven in a fairly hard state and the silk frequently exhibits quite considerable irregularities.

It has now been ascertained that one of the sources of these disadvantages is found in the unequal stretching of the spun fibres when drying. This unequal stretching takes place because in the washing process, the original regular shape of the hanks is frequently lost. Another source of irregularity is found to reside in the fact that in the processes hitherto employed the washed hanks were insufficiently and too unequally washed by means of the usual centrifuges.

According to the present invention these disadvantages are overcome by first washing and centrifuging the silk freshly spun by the centrifugal process, and then reeling it wet, and drying the resulting hanks while still intact.

Thorough washing is ensured by vigorously centrifuging the washed cake, for which purpose it is caused to rotate both during and after washing while it still remains either in the spinning pot itself or in the pot liner so as to prevent displacement of the threads of the cake.

The washing of the freshly spun cake cannot be carried out directly, because if this is done the ability of the cake to be reeled off is generally lost. These cakes can only be reeled off if the threads therein are not stuck together, and also provided that the cake is still so firm that it does not collapse either before or during reeling. Moreover, the various threads or layers of threads must not be tangled or pushed through each other, as this causes disturbance when reeling off the yet soft and wet thread.

According to the present invention, washing of the cake without destroying its ability to be reeled off is effected by rotating it rapidly on revolving spindles while still in the spinning pot or spinning pot liner, of the well known kind, at the same time spraying it from within with water in a very fine state of subdivision.

The water is driven through the mass of the spun cake by centrifugal force and is carried off in an outward direction. Owing to the limited and uniformly distributed supply of water to the cake, and owing moreover to the instant removal of the water in an outward direction, the thread never has a chance to float, and the positions of the threads are not altered by the finely divided particles of liquid sprayed upon them, nor is the shape of the threads altered, as by a coarse spray used heretofore. The cake therefore does not lose its coherence or shape, because during this careful washing its coherence is maintained by the action of the centrifugal force.

The washing process can be carried to completion very expeditiously. In order to have the cake cohere well, and to thoroughly eliminate the last traces of water, the centrifuging is preferably continued for some time after the supply of water has been shut off.

Water subdividers or sprinklers of the type which spray the water onto the cake of thread practically in the form of mist (that is to say, so-called "atomizer" nozzles, and in particular, the well known Schlick nozzle) are especially suited for this purpose. Such exceedingly fine subdivision of the water ensures a high degree of protection for the spun cake. Fine subdivision and uniform application of the water all over the spun cake are essential, but it is of secondary importance whether this application of finely divided water to the cake be effected by means of pressure, suction, or centrifugal action.

The washing process, which may be concomitant to the spinning operation, may, if necessary, be carried out on the spinning machines, that is to say, on the actual spinning spindles themselves, and it has been ascertained that my washing process always lasts

about a quarter of an hour, according to the kind and size of the spinning pot, the contents thereof and similar factors.

The encumbrance of the washing process with the spinning spindles is therefore generally impracticable, and it is more convenient to provide separate washing spindles to which the pot or liner is transferred, if necessary, and arranged at the back of the spinning centrifuges proper.

The cakes while being washed, and more especially those which have been already washed, must be carefully protected against the action of chemical agents, such as acids, lyes, salts and the like, which are as a rule used on the spinning machines.

Finally, the gearing of the washing spindles to the driving parts of the centrifugal machine is undesirable, since the working periods of the washing spindles, their number, and under certain circumstances, even their speed of rotation, may be small in comparison with the corresponding constants of the centrifugal machines. All these facts are taken into consideration according to the present invention, by providing separate washing spindles for washing out the cakes, and these washing spindles are preferably erected quite separate from the spinning machine. The washing spindles allotted to one or more machines may conveniently be grouped together in the form of a small separate washing machine. The washing machines are driven in a manner similar to that customary for the spinning spindles, either by separate electric motors or by a mechanical transmission, using worms and worm wheels, or by friction or equivalent means.

The washing machines are fitted with the required number of washing spindles for the reception of the vessels containing the spun cakes and with the driving mechanism required therefor, with pipes for the washing fluid, nozzles for sprinkling the cake, protective and collecting devices for catching the fluids thrown off, corresponding exhaust and discharge pipes, and, if necessary, any suitable appliances for drawing off gases and vapors evolved.

When washing the cakes, the first wash waters, which contain the major portion of the reagents of the spinning bath adhering to the threads, may be carried off separately, so as to permit the ready recovery of the chemicals, if desired. De-sulphurizing, bleaching or softening reagents may be added to the wash water, or to a portion thereof.

I claim.

A process for the treatment of artificial silk which comprises spinning a cake of thread having a plurality of concentric layers in a spinning receptacle, supplying an atomized washing liquid with the cake while in its spinning receptacle and supported by the outer walls of such receptacle, the inner walls of the cake remaining mechanically unsupported, and rotating the receptacle and the cake during such operation, eliminating the greatest part of the water not chemically combined by further rotating the receptacle with the cake, then reeling the thread and finally drying it in hanks.

In testimony whereof I have signed my name to this specification.

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