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ARTIFICIAL SILK HOSIERY

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This invention relates to the manufacture of full fashioned hosiery from yarn of artificial origin, but primarily has for its object the simplification of the handling of the artificial silk yarn prior to its knitting on the full fashioned hosiery knitting machine.

In the early stages of the manufacture of full fashioned hosiery from yarn of artificial origin, particularly viscose silk, it was the practice to use dry yarn in knitting the hosiery. The unfinished hosiery thus produced showed a very irregular formation of mesh, which even in the finished product, i. e., after remoistening, dyeing, finishing and drying, did not improve to any great extent. After numerous experiments the trade has realized that a moistening of the artificial silk yarn prior to the knitting operation is necessary. (See Technologie der Textilfasern "Kunstseide", Berlin, 1927, page 303, lines 33-37). It has then been considered a prerequisite to knit hosiery from artificial silk yarn having a moisture content of more than 15%, preferably from 18 to 20%. The moistening operation has long been carried out in a way whereby the spools containing the yarn were either exposed to a vaporous atmosphere, or directly placed in a steamer; or, which was even more suitable, the artificial silk yarn was moistened during a special rewinding process, particularly in the manufacture of yarn on cones. Owing to the fact that the greater part of the artificial silk yarn now produced is delivered in cone form, the moistening of the yarn is already carried out in the yarn manufacturers' plants during the winding of the cones. The moistened cones are then packed in moistureproof wrappers, for example, tinfoil, paraffin paper and the like, in order to preserve their original moisture content. It is then the converter's duty to observe that the cones have no opportunity to dry out after being unwrapped and that during knitting the moisture content of the yarn is not reduced. The knitting machines are therefore provided with glass hoods and water troughs in order to prevent the yarn from drying out.

It is an object of the present invention to avoid all of these moistening and rewinding steps, the moistureproof packing of the yarn and the precautionary measures observed for maintaining the original moisture content of the yarn during the knitting thereof.

Other objects will become apparent from a study of the following specification.

The invention is based upon the concept that it is not necessary to produce unfinished hosiery having a perfect mesh formation. Since all un-

finished hosiery is again moistened and dried, either for the purpose of reviving, bleaching or dyeing, it is absolutely satisfactory if the finished products after these after-treating or finishing operations show a perfect mesh formation, i. e., an improvement and equalization of the mesh formation would have to take place during the after-treatment or finishing of the hosiery. It has now been found that this improvement and equalization of the unfinished hosiery will take place if a special kind of artificial silk yarn is used. The yarn to which reference is had is artificial viscose silk, having a high degree of shrinkage, which has been knit in the dry state. The unfinished hosiery produced therefrom has a comparatively wide and very irregular mesh formation, but changes completely during the after-treatment, dyeing and drying. Due to the shrinkage of the knitted yarn during remoistening and drying the meshes become much tighter and very uniform. Repeated experiments have shown that in order to satisfactorily knit artificial silk, such as viscose silk, in the dry state it is only necessary to use artificial silk yarn which possesses to a high degree, but very uniformly, shrinkage capability, in order to insure that irregular meshes in the unfinished hosiery are completely equalized during the after-treatment, i. e., remoistening and drying of the knit goods. In order to obtain the best results the artificial silk yarn must have a shrinkage capacity of at least 3%, preferably about 5%, which must be uniform throughout the entire length of thread. This highly shrinking artificial silk is knit with a comparatively wide spacing of the needles of the knitting machine. Consequently, wider meshes are primarily produced and the unfinished hosiery is comparatively longer than the length desired. During the after-treatment and/or shrinkage the width of the meshes and the length of the stocking shrink to the desired measurements.

Artificial silk which may be satisfactorily knit in the dry state can be produced in accordance with the so-called continuous process. The direct manufacture of the artificial silk in a single continuous operation yields a highly shrinking yarn, while the continuous operation of the process makes it possible to uniformly maintain this property over the entire length of the spun thread. Untwisted yarn of this kind may also be knit in accordance with the new process.

If ordinary artificial silk, such as produced in accordance with the pot spinning or spool spinning process, i. e., artificial silk which has not completely shrunk, is knit in the dry state simi-

larly poor results as experienced in the beginning of the manufacture of hosiery from artificial silk, will be obtained. This kind of artificial silk, which may be considered as more or less shrunk 5 yarn, possesses a low shrinkage capacity, which in yarn spun in accordance with the pot spinning system may at certain places amount to 1-1½%, while in yarn spun by the spool spinning process certain places of the yarn may have a shrinkage 10 capacity of 2-2½%. These yarns possess the very unfavorable property that considering the entire length of the thread, the shrinkage capacity is very irregular. These are the reasons that in spite of a certain partial shrinkage capacity it is 15 necessary to moisten the artificial silk produced in accordance with the so-called direct spinning process, prior to the knitting thereof, if it is desired to obtain a half-way satisfactory mesh formation.

20 Having now set forth the invention as required by the patent statutes, what is claimed is:

1. In the process of manufacturing hosiery from continuous filament yarn of artificial origin, the steps comprising knitting the hosiery from 25 yarn having high uniform shrinkage character-

istics and in the dry state, said hosiery having an irregular net formation, and thereafter moistening the said knitted hosiery fabric whereby the mesh of the said fabric is equalized.

2. In the process of manufacturing hosiery 5 from continuous filament yarn of artificial origin, the steps comprising knitting the hosiery from yarn having a shrinkage capacity of at least 3% and in the dry state, said hosiery having an irregular net formation, and thereafter moistening 10 the said knitted hosiery fabric whereby the mesh of the said fabric is equalized.

3. In the process of manufacturing fabrics from continuous filament yarn of artificial origin, the steps comprising knitting the fabric with a 15 comparatively wide mesh from yarn having a shrinkage capacity of at least 3% and in the dry state, said fabric having an irregular net formation, and thereafter moistening the fabric where- 20 by the mesh of the said fabric is equalized.

4. A process according to claim 3 in which the yarn has a shrinkage capacity of preferably 5%.

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