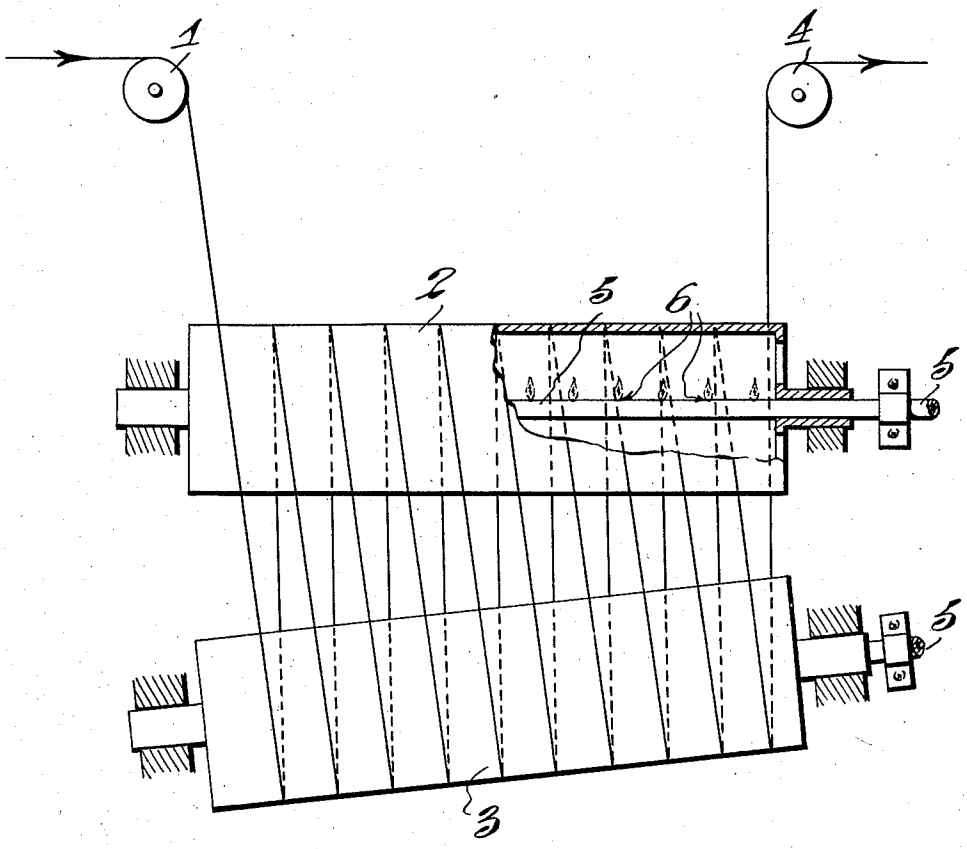
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METHOD OF DRYING ARTIFICIAL FILAMENTS

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METHOD OF DRYING ARTIFICIAL FILAMENTS

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This invention relates to the manufacture of yarn of artificial origin, but previously has for its object an improved method of drying of the filaments in a so-called continuous process apparatus.

Various methods have heretofore been used in which artificial filaments were dried by running the threads over so-called drying rollers. This has usually been done in machines wherein the filaments are extruded, drawn, given the different after treatments, such as bleaching, desulfurizing, etc., then dried and collected, all these operations being done on the one apparatus in a continuous process. In these types of machines it has been found that the yarn produced is of an inferior quality.

In view of the foregoing it has finally been found that the reason for obtaining filaments having inferior qualities has been due to the tension created in the filaments as they pass to the heating rollers as well as when the filaments are drawn off of these rollers. It is therefore the purpose of the present invention to provide an improved method in the drying of artificial filaments.

One object of the present invention is to devise a method whereby the thread is passed to the drying rollers under little or no tension and then drawn off the drying rollers under little or no tension.

These and other objects will in part become obvious and will in part be pointed out in the following specification taken in connection with the attached drawing, in which the arrangement of apparatus used in our novel method is illustrated in a diagrammatic view, parts of which are shown in section.

In the drawing in which like numerals of reference indicate like parts, 1 indicates a driven drawing roller over which the thread first passes on its way to the driven drying rollers 2 and 3. These drying rollers 2 and 3 are heated interiorly in any suitable manner or as shown in the drawing wherein a gas pipe 5 supplies the burners 6.

After passing a number of times around the drying rollers 2 and 3 the filaments are then drawn off by a second driven drawing roller 4 over which they pass on their way to the collecting means (not shown).

The essential feature of the invention lies in the fact that the filaments during their passage from the roller 1 to the receiving point at the lower drying cylinder 2 are practically under no tension. This is also true of the point where the filaments pass from the lower roller 2 to the driven drawing roller 4. This is effected by rotating the drawing rollers 1 and 4 and the drying cylinders 2 and 3 at suitable speeds.

The speed of the drawing roller 1 is a little less than the peripheral speed of the drying drums 2 and 3. This difference in speed, however, should be chosen in such a way as to allow the tension of the thread to be less than 5 grams which is a very slight tension to take care of any slack in the thread.

Due to the inclined relationship of the drying rollers 2 and 3 the threads are kept in spaced relations in their passage around these rollers and only little shrinkage takes place in this section. The peripheral speeds of the drying cylinders 2 and 3 are exactly the same.

The threads or filaments during drying in their passage around the rollers 2 and 3 would create considerable tension at the take-off point if the peripheral speed of the drawing roller 4 were not regulated to allow for this. The speed of this roller 4 is therefore sufficiently less than the peripheral speeds of the drying cylinders to compensate for this tension, which ensures the filaments passing to the collecting means under little or no tension.

In the experiments which have been made in the evolving of this novel method it was found that exceptionally good results were obtained if the take-up and take-off tension were less than 1 gram of tensile stress for artificial silk of 100 denier. It was further determined that it was possible in the manufacture of artificial threads of 100 denier that a tensile stress of up to 5 grams was allowable without seriously reducing the elongation qualities of the filaments. The above mentioned limits of tensile strength refer to the average titer of about 100 denier and vary in accordance with the titer strength of the filaments.

By having little or no tension on the filaments as they pass to the drying rollers 2 and 3 results in the drying effecting only the unstressed filaments. During the drying step, however, while the filaments are still on the drying rollers, the filaments shrink and thereby create a certain amount of tension, but due to the lack of tension at the take-off point, this tension is released with the resulting beneficial effect on the physical properties of the filaments.

This method is also applicable where only one drying roller is used and the threads lead once around the roller or a plurality of times around the roller. It may also be used with so-called dry reels or where rotating rollers inclined to each other are employed whereby the one or the other

or both rollers may be simultaneously heated, or whereby the heating or drying is effected by rotating cylinders in heated spaces.

Having now set forth the novel method constituting the invention as required by the Patent Statutes, what is claimed is:

1. In a method of drying artificial filaments the steps of passing the filaments to drying surfaces under less than 5 grams tensile stress, then passing the filaments from the drying surfaces under less than 5 grams tensile stress.

2. In a method of drying artificial filaments the steps of passing the filaments to drying surfaces under less than 1 gram tensile stress, then passing the filaments from the drying surfaces under less than 1 gram tensile stress.

3. In the manufacture of artificial filaments the steps of extruding the filaments, passing the filaments to a heated rotating surface under less than 5 grams tensile stress, then passing the filaments from the heated rotating surface to a collecting means under less than 5 grams tensile stress.

4. In a method of drying artificial filaments the steps of passing the filaments to heated rotating surfaces under less than 5 grams tensile stress, passing them around said surfaces a plurality of times and then passing them from the heated rotating surfaces under less than 5 grams tensile stress.

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