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MANUFACTURE OF YARNS CONTAINING STAPLE FIBER FROM YARNS COMPOSED OF CONTINUOUS FILAMENTS

Original Filed Feb. 4, 1937

FIG. 1

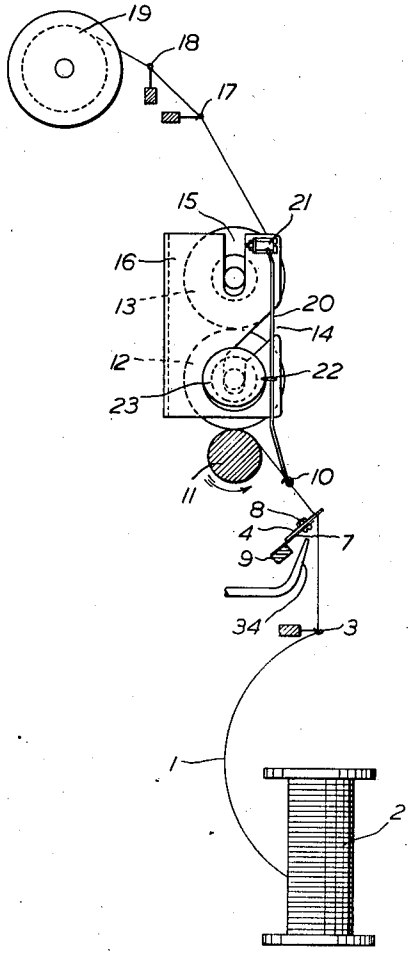


FIG. 2

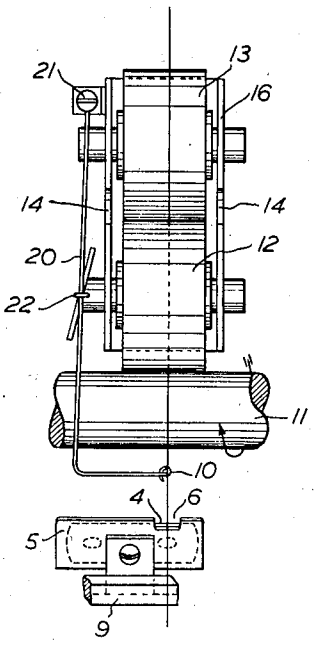
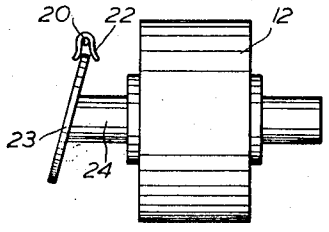


FIG. 3



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MANUFACTURE OF YARNS CONTAINING STAPLE FIBER FROM YARNS COMPOSED OF CONTINUOUS FILAMENTS

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Original application February 4, 1937, Serial No. 124,048. Divided and this application August 5, 1939, Serial No. 288,524. In Great Britain February 12, 1936

4 Claims. (Cl. 19—1)

This invention relates to the manufacture of yarns containing staple fibers from yarns composed of continuous filaments, and is divided from application No. 124,048 for "improvements in the Manufacture of yarns containing stable fibers from yarns composed of continuous filaments," filed February 4, 1937.

According to the present invention yarns containing staple fibers are produced by continuously drawing yarns composed of continuous filaments, for example yarns of cellulose acetate artificial silk or the like, over a razor edge in such a way that at intervals along the yarn, some but not all of the filaments are severed.

Besides the yarns composed of continuous filaments of cellulose acetate referred to above, yarns containing continuous filaments of other materials may also be used for the purpose of the invention, for example materials having a basis of other organic derivatives of cellulose, regenerated cellulosic materials, for example cuprammonium artificial silk and viscose artificial silk, and natural silk.

The yarns treated should preferably be lightly twisted but even untwisted yarns may be used provided that suitable means are adopted to maintain the necessary coherence between the severed and the unsevered filaments, for example by sizing or by the insertion during winding of twist which runs back from the collecting device as far, or nearly as far, as the razor edge. On the other hand it is of advantages that the filaments in the yarn should not be so closely packed as to prevent them from spreading somewhat during the severing.

The invention is particularly advantageous when applied to continuous filament yarns whose volume or bulk has been increased, e. g., by subjecting the yarn, either on its way to the razor edge or in a previous stage, to a false twisting operation in the course of which the twist inserted in the yarn is set, e. g., by the application of wet steam or other setting agent. In the case of a false twisting operation of this kind the twist so set in the yarn automatically runs out owing to the nature of the false twisting operation. Alternatively the yarn may, in a previous stage, have been actually twisted prior to or during setting of the twist, in which case the twist should preferably be removed. Indeed, in the case either of a twisting or of a false twisting operation carried out in a previous stage a small quantity of twist in the reverse direction to that set in the yarn may conveniently be imparted to the yarn after the setting and removal of twist. In the case either of a twisting or of a false twist operation, the setting and removal of twist leaves the yarn with a greater bulk than it previously possessed on account of the distortion of the individual filaments, imposed while the yarn was temporarily twisted and retained after untwisting. A yarn whose bulk has been increased in this manner, and which has been given a small degree of reverse twist, is particularly convenient for the purposes of the present invention.

One form of apparatus according to the present invention will now be described in greater detail with reference to the accompanying drawing, in which:

Fig. 1 is a diagrammatic side elevation of an apparatus according to the invention;

Fig. 2 is a front elevation of a part of Fig. 1; and

Fig. 3 shows a detail of the apparatus shown in Figs. 1 and 2.

Referring to Figs. 1 and 2, the yarn 1 is drawn from a stationary package 2 through a balloon guide 3 and then proceeds directly over an exposed part of the edge of a blade 4 which is of the wafer type commonly employed in safety razors. The blade 4 is provided with a guard 5 having a gap at 6 in one of its edges through which gap the yarn is caused to pass. The blade 4 and the guard 5 are secured to a holding plate 7 by means of a nut and bolt 8. The holding plate 7 is carried on a bar 9 and is set at an acute angle of, e. g., 45°, to the yarn coming to it so that the yarn is drawn past the edge, and the filaments are not instantly and simultaneously severed.

From the edge of the blade at the gap 6 the yarn passes through a pig-tail guide 10 and thence round three rollers 11, 12, 13. The roller 11 is a driven roller and drives the rollers 12 and 13 by friction. The rollers 12 and 13 drop into slots 14 and 15 in a bracket 16, the slot 14 opening in front of the bracket so that the roller 12 may be dropped in in such a way that the yarn is caused to pass over the roller 11, behind the roller 12 and in front of the roller 13. From the roller 13 the yarn proceeds to the guides 17, 18 of a take-up device by means of which they are wound on a package 19.

The guide 10 is carried on a long wire 20 which is pivotally mounted at 21 on the bracket 16. A U-shaped piece of wire 22 is secured to the wire 20 and engages with a disc 23 obliquely secured to the spindle 24 of the roller 12, as is shown in Fig. 3. The obliquity of the disc 23 causes the wire 20 which is connected to the disc 23 by the

U-shaped wire 22 to oscillate about the pivot point 21 so that the pig-tail guide 10 oscillates to and fro lengthwise of the exposed edge of the blade 4. In this way the yarn is caused to traverse to and fro along the exposed part of the blade. In order to prevent the accumulation of loose severed filaments beneath the blade 4, a nozzle 34 is provided in order to direct a jet of air against the edge of the blade, and blow any loose filaments away. In place of the nozzle 34 there may be employed a rotating brush or a wiper which may be synchronized with the reciprocation of the thread.

When yarn having a crinkle produced by twisting the yarn, setting the twist therein and removing the twist is employed, it is preferable that the take-up package 19 should be rotated at a speed slightly lower than the peripheral speed of the rollers 11, 12 and 13 so that the crinkle is not pulled out by the tension between the take-up package 19 and the roller 13.

Having described our invention, what we desire to secure by Letters Patent is:

1. Apparatus for the production of yarn containing staple fibers from yarns composed of continuous filaments, said apparatus comprising a blade having a razor-like cutting edge, means for continuously drawing yarns composed of continuous filaments over said edge and means for traversing the yarn along said edge so that at intervals along the yarn some, but not all, of the filaments are severed.

2. Apparatus for the production of yarn containing staple fibers from yarns composed of continuous filaments, said apparatus comprising a blade having a razor-like cutting edge, means for continuously drawing yarns composed of continuous filaments over said edge, a guide for leading the filaments in contact with said edge, and means for reciprocating said guide to and fro parallel to said edge so as to traverse the yarn along said edge whereby at intervals along the yarn some, but not all, of the filaments are severed.

3. Apparatus for the production of yarn containing staple fibers from yarns composed of continuous filaments, said apparatus comprising a blade having a razor-like cutting edge, means for continuously drawing yarns composed of continuous filaments over said edge, said blade being set so as to form an acute angle with the yarn about to cross the edge of said blade, and means for traversing the yarn along said edge so that at intervals along the yarn some, but not all, of the filaments are severed.

4. Apparatus for the production of yarn containing staple fibers from yarns composed of continuous filaments, said apparatus comprising a blade having a razor-like cutting edge, a guard adapted to cover a part of said edge and means for continuously drawing yarns composed of continuous filaments over said edge so that at intervals along the yarn some, but not all, of the filaments are severed.

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