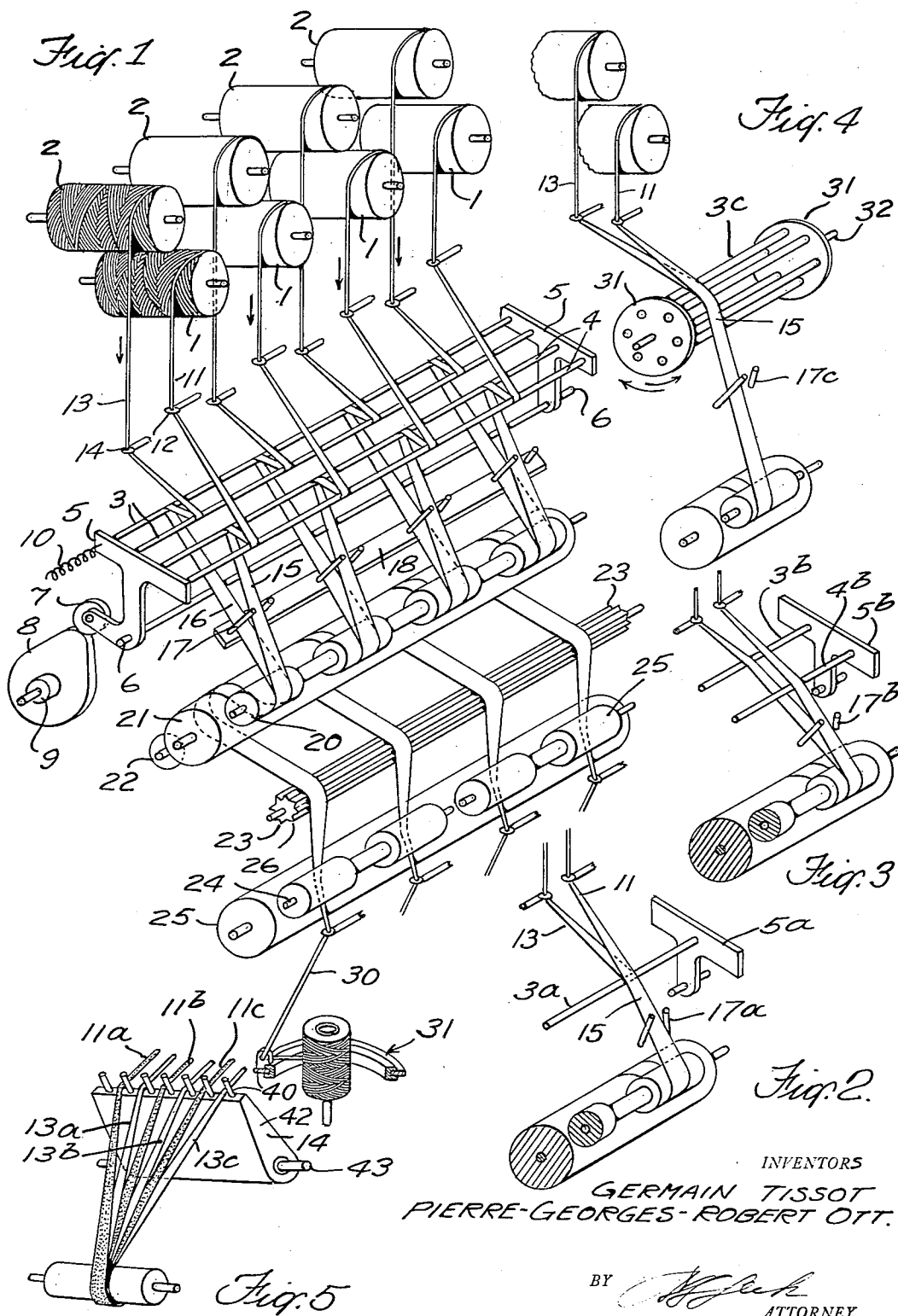


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METHOD AND APPARATUS FOR THE
MANUFACTURE OF BLENDED YARNS
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METHOD AND APPARATUS FOR THE MANUFACTURE OF BLENDED YARNS

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3 Claims. (Cl. 19—41)

This invention relates to the production of blended yarns from continuous filament tow and has for an object to provide a novel and improved method and apparatus for the simultaneous cracking by drawing to rupture of a bundle composed of a mixture of two or more continuous filament tows having different characteristics.

Another object is to provide for the conversion of a mixed tow of continuous filaments into top by drawing to rupture.

Another object is to provide for the direct spinning of a blended yarn from tow composed of mixtures of two or more different types of continuous filaments.

Another object is to produce staple fiber blended top which is suited for spinning into a uniformly blended yarn.

Another object is to produce a blended yarn having novel and improved characteristics.

Various other objects and advantages will be apparent as the nature of the invention is more fully disclosed.

The nature of the invention will be better understood by referring to the following description, taken in connection with the accompanying drawing in which a specific embodiment thereof has been set forth for purposes of illustration.

In the drawing:

Fig. 1 is a diagrammatic representation of one type of apparatus embodying the present invention;

Figs. 2, 3 and 4 are detailed views showing different modified mechanisms for forming and superimposing the ribbons of continuous filaments; and

Fig. 5 is a diagrammatic view showing mechanism for dividing and mixing continuous filament bundles to form a mixed tow.

Referring to the drawing more in detail, Fig. 1 shows a series of spindles 1 and 2 of a direct spinning machine embodying the present invention. The spindle 1 may for example contain continuous filament nylon tow or the like and the spindles 2 may contain continuous filament viscose tow.

In accordance with the present invention a spreading device is provided for converting the continuous filament bundles of tow into thin ribbons of continuous filaments. This spreading device is shown in Fig. 1 as comprising a grid composed of a plurality of bars 3 and 4 secured at their ends to brackets 5 which are pivoted at 6 for oscillation about an axis parallel to the axes of the bars 3 and 4. One of the brackets 5 carries a cam follower 7 which rides on a rotating cam 8 mounted on a shaft 9, driven by suitable means not shown so as to cause the grid device to oscillate.

The tows 11 from the spindles 1 pass through guides 12 and are wrapped in a Z path around the grid bars 3 and the tows 13 from the spindles 2 pass through guides 14 and are wrapped around the grid bars 4. The grid bars hold the tows under tension and because of their oscillation serve to spread the bundles of tow into thin layers or ribbons of continuous filament. The tows 11 are thus

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formed into ribbons 15 of continuous filament and the tows 13 are formed into similar ribbons 16.

The ribbons 15 and 16 are fed between guide pins 17 mounted on a bar 18 and are superimposed to pass together around guide rolls 20, thence around feed rolls 21 and between feed rolls 21 and 22, over a breaker roll 23 and between stretch rolls 24 and 25 which are operating at a faster speed than the feed rolls 21 and 22.

The breaker roll 23 comprises a fluted roll having a plurality of projecting flanges 26 having non-cutting edges which engage and deflect the filaments as they pass thereover. The breaker roll 23 is disposed out of alignment with the direct path of the filaments between the feed rolls 21 and 22 and the stretch rolls 24 and 25 so that the direction of the filaments changes as they pass the breaker roll 23.

In the operation of this form of the invention the filament tow bundles are spread out into thin ribbons 15 and 16 of continuous filaments due to the tension and rubbing action exerted upon the filaments by the bars 3 and 4 as the grate is oscillated. The mixed filaments in the two superimposed ribbons are cracked into a blended top by the operation of the stretching rolls 24 and 25 and the breaker roll 23 in a manner similar to that described in U. S. Patent No. 2,635,295.

The tension of the grid bars causes the superimposed continuous filaments to be alternated and mixed and to be cracked simultaneously into a top of staple fibers even though the continuous filaments of the two ribbons have substantially different stretch characteristics.

In order to facilitate the cracking of the two ribbons the synthetic filaments may be completely desized prior to cracking followed by the application of a new sizing after the cracking, as set forth more in detail in application Serial No. 482,300.

It is to be understood that the continuous filament tows may be composed of filaments of different materials, or the filaments may be of the same materials and have different deniers, or the filaments may be of different colors. The tops 30, thus produced, are uniformly blended and may be spun into a yarn having improved characteristics. The tops 30 may be fed from the stretching rolls 24 and 25 directly to a spinning frame such as a ring twister 31 or the like for spinning into a blended yarn.

It is found that the yarn thus produced is uniformly blended regardless of variations in characteristics of the different filaments which are used. Also more than two ribbons may be superimposed for simultaneous cracking depending upon the desired composition of the yarn.

By way of example it has been possible, by use of the present invention, to obtain satisfactory 150 denier blended yarn from a 4000 denier bundle of regenerated cellulose filaments of 2.5 deniers each and a 2000 denier bundle of nylon filaments of 1.5 denier each. The yarn showed an excellent mixture of the fibers formed by the braking operation in spite of the great difference in breaking characteristic of the two filaments.

In the form shown in Fig. 2 a single spreader bar 3a is provided which is attached to the brackets 5a similar to the bracket 5 of Fig. 1. The filament bundles 11 and 13 are superimposed over the bar 3a which is oscillated in the same manner as the bars 3 and 4 of Fig. 1 so that the bundles are spread thereby into superimposed ribbons 15 which are fed between guides 17a around guide roll 20 as in Fig. 1.

Fig. 3 illustrates a further embodiment of the invention wherein the spreading device includes two bars 3b and 4b over which the respective tows 11 and 13 are fed. The bars 3b and 4b are attached to brackets 5b which are similar to the brackets 5 of Fig. 1 and are oscillated in a similar manner for spreading the tows into ribbons 15 and

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16 which are superimposed and passed between guides 17b around guide roll 20 in Fig. 1.

In accordance with Fig. 4 the spreader is of the bird cage type comprising a plurality of bars 3c mounted on end disks 31 which are attached to a shaft 32. Means not shown is provided for rotating or oscillating the shaft 32 or the cage may be rotated by the ribbon which is pulled thereover. The shaft 32 may be driven in the direction of feed of the ribbon or in the reverse direction. The ribbons 15 are superimposed on the cage and fed between guides 17c to guide roll 20 as in Fig. 1.

In accordance with the embodiment shown in Fig. 5 the bundle of filaments 11 is divided into three parts, 11a, 11b and 11c and the bundle 13 is divided into three parts 13a, 13b and 13c which are passed over an oscillating comb 40 mounted on an arm 42 which is pivoted to a shaft 43 and may be oscillated in the manner set forth in Fig. 1.

While certain specific embodiments have been shown for purposes of illustration, it is to be understood that the invention is capable of various uses as will be apparent to a person skilled in the art.

What is claimed is:

1. Apparatus for making uniformly blended yarn from at least two tows of continuous filaments having different characteristics, comprising a spreading device for spreading each of said continuous filament tows into a flat ribbon of parallel continuous filaments, means for superimposing said ribbons to form a composite ribbon composed of a blended mixture of said filaments, cracking

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mechanism for converting said composite ribbon into top by drawing to rupture, comprising a pair of feed rolls and a pair of stretch rolls operating at progressively higher speeds so as to stretch the ribbon to rupture, means for directing the composite ribbon to said feed rolls said spreading device comprising a plurality of parallel spaced bars, said tows being fed around at least two of said bars and means for oscillating said spreading device to and fro in a direction parallel to the direction of feed of said tow.

2. The invention set forth in claim 1 in which said bars are mounted on an oscillating bracket.

3. The method of making blended yarn from at least two tows of continuous filaments having different characteristics, which comprises spreading each tow into a flat ribbon of parallel filaments, superimposing said ribbons to make a composite ribbon of blended filaments, drawing said composite ribbon to rupture to form a staple fiber top and spinning said top into a yarn composed of blended fibers.

References Cited in the file of this patent

UNITED STATES PATENTS

2,031,647	Hale	Feb. 25, 1936
2,419,320	Lohrke	Apr. 22, 1947
2,635,295	De Lacotte et al.	Apr. 21, 1953

FOREIGN PATENTS

501,155	Great Britain	Feb. 22, 1939
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