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METHOD AND APPARATUS FOR PRODUCING MULTI-COLORED SINGLE  
YARN IN SIMULATION OF PLY YARN  
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*Fig. 1.*

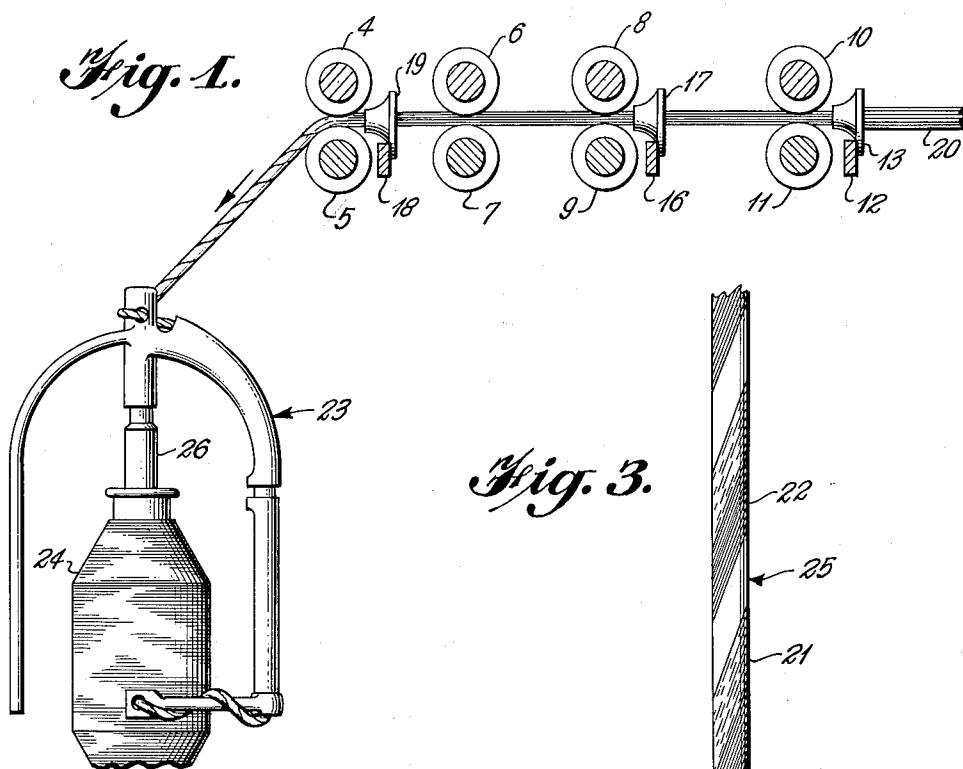


*Fig. 3.*

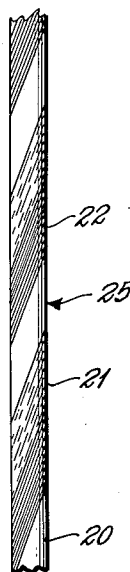
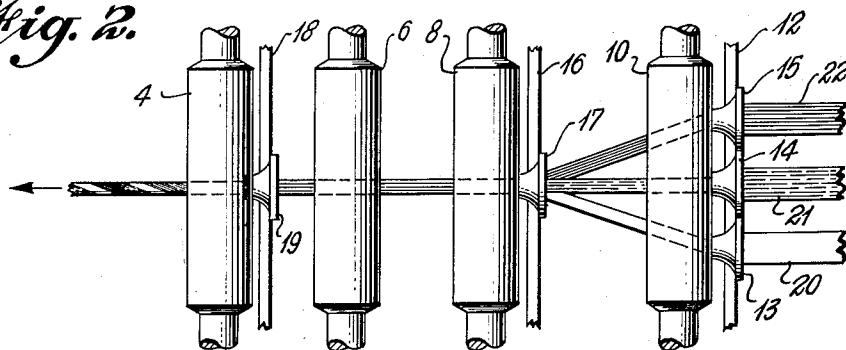


*Fig. 2.*



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1

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**METHOD AND APPARATUS FOR PRODUCING MULTI-COLORED SINGLE YARN IN SIMULATION OF PLY YARN**

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4 Claims. (Cl. 57—36)

The present invention relates to a method and apparatus for producing multi-colored single yarn which resembles in appearance ply yarns composed of a plurality of ends of different colors. The invention is more particularly concerned with the production of such yarns directly from drawing slivers of different color by use of a modified roving frame.

The invention may be briefly described as involving the production of a plurality of drawing slivers of different colored fibers, the simultaneous independent condensing of those different colored slivers, the simultaneous introduction of the independently condensed slivers into a roving frame having a plurality of drafting stages, the condensing together of the slivers of different colors in at least one of the drafting stages, and the imparting of twist in excess of roving twist to the fibers delivered by the front rolls of the roving frame to directly produce a single yarn which has the appearance of a multi-colored ply yarn.

One of the primary objects of the invention is to inexpensively produce a multi-colored single yarn having the appearance of a ply yarn composed of ends of different colors.

Another object of the invention is to provide simple and inexpensive modifications of a conventional roving frame to enable the production of such yarns.

The foregoing and other objects and advantages of the invention can be more fully understood from the following description which has reference to the accompanying drawing wherein:

FIGURE 1 is a view partially in vertical section and partially in side elevation of those portions of the modified roving frame which are necessary to an understanding of the invention;

FIGURE 2 is a top plan view of the apparatus illustrated in FIGURE 1; and

FIGURE 3 is an enlarged side elevational view of a yarn produced by the apparatus of FIGURES 1 and 2.

The apparatus includes the conventional drawing rolls of a roving frame including the front rolls 4 and 5, the second rolls 6 and 7, the third rolls 8 and 9, and the back rolls 10 and 11. Stationarily fixed behind the back rolls 10 and 11 is bar 12 to which is fixed three stationary, laterally spaced trumpets 13, 14 and 15. A stationary bar 16 is fixed behind the third rolls 8 and 9 and has fixed thereto a stationary, centrally positioned trumpet 17. A stationary bar 18 is positioned behind the front rolls 4 and 5 and has fixed thereto a centrally positioned trumpet 19.

Drawing sliver 20 of a first color is passed through and condensed in the trumpet 13 behind the back rolls 10 and 11. Drawing sliver 21 of a second color passes through and is condensed in the trumpet 14 behind the back rolls 10 and 11. Drawing sliver 22 of a third color passes through and is condensed in the trumpet 15 behind the back rolls 10 and 11. The slivers 20, 21 and 22, after being thus condensed, pass through the back rolls 10 and 11 and enter the first stage of the drafting zone. All three of the slivers 20, 21 and 22 are condensed together in the centrally positioned trumpet 17 behind the third rolls 8 and 9. The fibers are subjected to further drafting between the second and third rolls and between the front

2

and second rolls. The fibers of the previously condensed slivers are again condensed at the centrally positioned trumpet 19 behind the front rolls 4 and 5.

The fibers delivered from the front rolls 4 and 5 are guided by the flyer designated generally by the reference numeral 23. The flyer 23 is conventional. It is driven by the spindle 26, the speed of which has been increased to impart twist greater than normal roving twist. The speed of spindle 26 to which flyer 23 is attached is preferably adjusted to impart the same twist which the fibers would obtain in a conventional spinning frame. A twist of 2.38 turns per inch has been found satisfactory for a yarn which has a unit size of 0.78/1 cotton equivalent. The product is collected on the package 24.

The product, which is better illustrated in FIGURE 3 and designated generally by the reference numeral 25, is properly designated as a yarn rather than a roving in spite of the fact that it has been produced on a modified roving frame. The yarn 25, because of the amount of twist therein, could not be further drafted in a subsequent process. The product 25 illustrated in FIGURE 3 is composed of the three colors which originally formed the slivers 20, 21 and 22, those numerals being used in FIGURE 3 to designate the source of the fibers. The fibers of each color are concentrated together and the product, although a single yarn, resembles the appearance of a ply yarn having ends of three different colors.

It is of extreme importance that the bars 12, 16 and 18 and the trumpets carried by those bars be stationary. In other words, the bars 12, 16 and 18 must have no traverse motion. Any traverse motion of the bars 12, 16 and 18 would result in rolling action of the fibers within the drafting zone which would permit intermingling of fibers of different colors and would destroy the color separation to an objectionable extent.

The invention has been illustrated and described in connection with the production of a single yarn of three colors. It will be apparent, however, that the principles of the invention can be used to produce single yarns of two, four or more colors by utilizing less or more trumpets behind the back rolls 10 and 11.

The preferred embodiment of the invention has been illustrated and described. It will be apparent, however, that various modifications may be resorted to without departing from the broader scope of the invention defined by the claims.

Having thus described the invention, I claim:

1. A method for producing multi-colored single yarn, which method comprises individually condensing a plurality of drawing slivers of different colors, separately feeding the thus-condensed individual slivers into a common drafting zone having a plurality of drafting stages, condensing all of said plurality of slivers together in at least one of said drafting stages, and imparting to the fibers delivered from the drafting zone a twist in excess of roving twist to thereby form a multi-colored single yarn in simulation of a ply yarn having ends of different colors.

2. Apparatus for producing multi-colored single yarn in simulation of a ply yarn having ends of different colors, said apparatus comprising a roving frame having front, second, third and back rolls driven at such speeds as to effect drafting between said first and second rolls and between said third and back rolls, a plurality of laterally spaced, stationary trumpets behind said back rolls, each of said laterally spaced trumpets being arranged to condense and separately guide a drawing sliver of a different color to said back rolls, a single, stationary trumpet between said third and back rolls to condense all said colored slivers together behind said third rolls, a single, stationary trumpet between said front and second rolls to again condense all said colored slivers together behind

3

said front rolls, and twisting means for imparting a twist in excess of roving twist to the fibers delivered from said front rolls.

3. Apparatus for producing a multi-colored single yarn in simulation of a ply yarn having ends of different colors, said apparatus comprising a roving frame having front, back and intermediate rolls driven at such speeds as to effect drafting in a zone behind said front rolls, a plurality of laterally spaced, stationary trumpets behind said back rolls, each of said laterally spaced trumpets being arranged to condense and separately guide a drawing sliver of a different color to said back rolls, a single, stationary trumpet behind said front rolls in said zone to condense all of said colored slivers together behind said front rolls, and means for imparting a twist in excess of roving twist to the fibers delivered from said front rolls.

4. Apparatus for producing a multi-colored single yarn in simulation of a ply yarn having ends of different colors, said apparatus comprising a roving frame having front, back and intermediate rolls driven at such speeds as to

4

effect drafting in a zone behind said intermediate rolls, a plurality of laterally spaced, stationary trumpets behind said back rolls, each of said laterally spaced trumpets being arranged to condense and separately guide a drawing sliver of a different color to said back rolls, a single, stationary trumpet behind said intermediate rolls in said zone to condense all of said colored slivers together behind said intermediate rolls, and means for imparting a twist in excess of roving twist to the fibers delivered from said front rolls.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

|           |          |                |
|-----------|----------|----------------|
| 128,618   | Harris   | July 2, 1872   |
| 2,238,659 | Reynolds | Apr. 15, 1941  |
| 2,645,822 | Cabana   | July 21, 1953  |
| 2,728,112 | Berker   | Dec. 27, 1955  |
| 2,851,849 | Merrill  | Sept. 16, 1958 |