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COMPOSITE TEXTILE YARN

Filed March 13, 1961

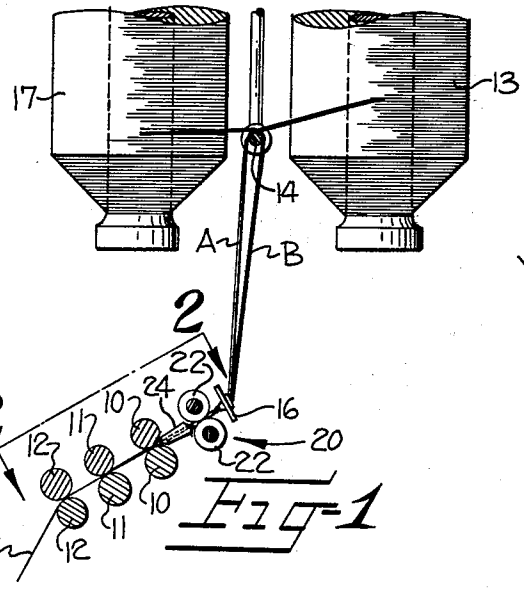


Fig-1

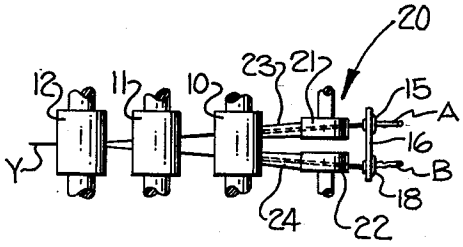


Fig-2

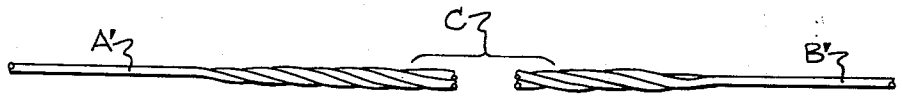


Fig-3



Fig-4

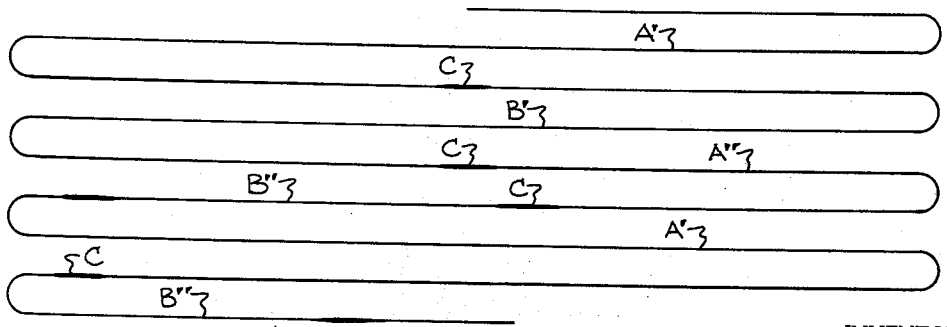


Fig-5

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COMPOSITE TEXTILE YARN

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The present invention relates to textile yarns and more particularly to spun or twisted composite textile yarns wherein sectional portions thereof have predetermined characteristics and the remaining sectional portions have different characteristics.

Broadly considered, the present invention contemplates the provision of a composite textile yarn preferably produced by a spinning, twisting or combined spinning and twisting operation, in which sectional lengths thereof are formed of fibrous strands having predetermined characteristics and other sectional lengths thereof are formed of fibrous strands having different characteristics. A yarn of this character may be used as the warp or filling or both for a woven fabric or as the yarn for a knitted fabric. By suitably choosing the different characteristics of the fibrous strands, a fabric may be produced which has a mottled or variable appearance either to the eye or the hand or both. More specifically, fibrous strands having the characteristics of rough cover or hand may be positioned in a predetermined manner with fibrous strands having the characteristics of smooth cover or hand which would produce a composite yarn having sectional lengths thereof of different cover or hand characteristics. When made into a fabric, such a yarn would impart thereto a variable cover or hand. Still further, fibrous strands of different dye affinities could be used to produce a yarn of the instant type such that when the yarn or fabric produced therefrom is dyed, a mottled effect is produced.

The different characteristics of the fibrous strands may be the natural characteristics of the material or materials of which the fibrous strands are constructed or may be induced characteristics. For example, natural characteristics would include dye affinity, coarseness or fineness of fibers which would result in rough or smooth cover or hand, and light reflectibility. Induced characteristics would include color which is imparted to the fibrous strands before inclusion in the yarn, and size or length or both of the sectional lengths of the different fibrous strands.

It is therefore an object of the present invention to provide a novel composite textile yarn and method of manufacturing the same wherein sectional lengths thereof are formed of fibrous strands having one characteristic and other sectional lengths thereof are formed of fibrous strands having at least one other characteristic.

Another object of the present invention is to provide a novel composite textile yarn and method of manufacturing the same wherein a first fibrous strand of predetermined characteristics is fed, drafted and twisted for a predetermined length, a second fibrous strand of different characteristics is fed, drafted and intertwisted in overlapping relation with said first strand, and the feed of the first strand is terminated while the feed, drafting and twisting of the second strand continued.

A further object of the present invention is to provide a novel composite textile yarn and method of manufacturing the same wherein varying lengths of a fibre strand having predetermined characteristics are longitudinally positioned in a predetermined manner with varying lengths of at least one other fibrous strand having different characteristics, the varying lengths of said fibrous strands being overlapped and intertwisted adjacent the terminal portions thereof to form a continuous yarn.

A still further object of the present invention is to

provide a novel composite textile yarn and method of manufacturing the same wherein a predetermined length of a first fibrous strand of predetermined characteristics is fed to a drafting and twisting mechanism, a second fibrous strand of different characteristics is fed to said drafting and twisting mechanism coextensively with said first strand such that the two fibrous strands are drafted and intertwisted, said coextensive feeding, drafting and twisting continuing only for a sufficient distance such that the two fibrous strands are secured together, the feed of the first fibrous strand to the drafting and twisting mechanism is then terminated while the feed of the second fibrous strand is continued for a predetermined distance, and the feeding, drafting and twisting of the two strands, and additional strands if desired, is continued in a predetermined order or manner.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

FIGURE 1 is a schematic view partly in section illustrating a spinning or twisting mechanism which may be used in producing the yarn of the present invention;

FIGURE 2 is an enlarged fragmentary detail taken in the direction of arrows 2—2 in FIGURE 1;

FIGURE 3 is an enlarged fragmentary detail of the yarn of the present invention showing the area of intertwisting of the terminal or proximal portions of two sectional lengths thereof;

FIGURE 4 is an enlarged fragmentary detail similar to that shown in FIGURE 3 wherein the area of intertwisting of the proximal portions of two sectional lengths of the yarn has been drafted to be of the same size as the yarn on either side of the intertwisted portion; and

FIGURE 5 is a diagrammatic view illustrating the yarn of the present invention showing the sectional lengths of the fibrous strands and the areas of interconnection therebetween.

Referring to the drawings and more particularly to the FIGURES 1 and 2, the composite textile yarn of the present invention may be produced on any conventional spinning or twisting mechanism or any conventional textile machinery having an attenuating mechanism in combination with a twisting mechanism. The mechanism which is preferably to be used is the conventional spinning frame comprising a set of drafting rolls **10**, **11**, **12** and a twisting mechanism (not shown).

A first fibrous strand A of predetermined characteristics is fed from a suitable source such as a roving bobbin **13**, over a guide member **14** to an eyelet **15** mounted in a suitable bracket **16**. A second fibrous strand B of different characteristics is fed from a suitable source such as a roving bobbin **17**, over guide member **14** to an eyelet **18** mounted in bracket **16**. The strands A and B are delivered from the eyelets **15** and **18** to the rear rolls **10** by a feed mechanism generally indicated at **20**. Feed mechanism **20** comprises a pair of driven rolls **21** for strand A and a pair of driven rolls **22** for strand B. A suitable guide **23** is mounted between feed rolls **21** and the rear roll **10** for guiding first strand A from feed rolls **21** to the rear rolls **10**. A second guide **24** is positioned between feed rolls **22** and rear rolls **10** for guiding second strand B from the feed rolls to the rear rolls. Guides **23** and **24** are convergingly arranged to direct first strand A and second strand B into drafting rolls **10**, **11** and **12** in converging paths of travel such that the two strands come together when fed coextensively and exit from the front rolls **12** in sufficiently close proximity to each other to be intertwisted.

While a feed mechanism of the above described type is shown and described as one way in which the fibrous strands may be delivered to the drafting rolls, it is con-

templated that any feeding means, including manual feeding, capable of feeding a predetermined length of a first fibrous strand to a set of drafting rolls, then feeding a second fibrous strand to the drafting rolls coextensively with the first fibrous strand for a predetermined distance and then terminating the feed of the first fibrous strand while continuing the feed of the second fibrous strand may be used within the scope of the instant invention. Further, while drafting rolls are shown and described, the same are used only by way of example since, as aforementioned, any type of attenuating mechanism may be used. Still further, while the feeding mechanism shown and described herein is capable of feeding only two fibrous strands, it is contemplated that feeding means for more than two fibrous strands may be provided without departing from the spirit of the instant invention.

Referring now to FIGURES 3 and 4 wherein the novel composite textile yarn of the present invention is shown, yarn Y comprises a predetermined length A' of first fibrous strand A and a predetermined length B' of the second fibrous strand B which have been suitably drafted and twisted and which are connected by a portion C comprising coextensive intertwisted portions of strands A and B. It is noted that the length of intertwisted portion C is only sufficient to secure the strands A and B together and will vary according to the amount of draft, the size of the strands A and B and the amount of twist which is applied thereto.

The yarn shown in FIGURE 4 is identical with that shown in FIGURE 3 except that the overlapping and intertwisting portion C of the fibrous strands A and B has been drafted to be of the same size as strands A and B. To accomplish this, the speed of the rear drafting rolls 10 of the drafting mechanism is decreased to one-half the normal speed during the coextensive feeding of strands A and B such that the draft is doubled. A mechanism for accomplishing the reduction of the speed of the rear drafting rolls is shown and described in United States Patent No. 2,069,446, issued to Leon H. Horner on February 2, 1937, and entitled Drawing Mechanism for Spinning or Twisting Machines.

Referring to FIGURE 5 wherein the manner or order in which the fibrous strands A and B are arranged to form yarn Y is shown, a first length A' of fibrous strand A is connected to a length B' of fibrous strand B, the lengths A', B' being of the same longitudinal dimension. A length A'' of fibrous strand A is connected to length B' and is of a longitudinal dimension which is different from lengths A', B'. A length B'' of fibrous strand B is connected to length A'' and is of a longitudinal dimension which is different from lengths A', B' and A''. The longitudinal dimension and size of the lengths of fibrous strands A and B may be varied in any order or proportion without departing from the spirit of the instant invention since the above lengths are given by way of example only.

Depending upon the result desired, the fibrous strands A and B may be formed of suitably chosen materials, which may be either natural or synthetic or both or blends of two or more materials, having different dye affinities such that when the strands are formed into the composite yarn, the yarn may be subjected to any of the well known cross-dyeing methods to produce the effect of a spaced-dyed yarn of different colors or shades. For example, if one of strands A and B were formed of cotton and the other of acetate rayon, the composite yarn could be cross-dyed using a "develope dye" or "direct yellow" for the cotton and a "disperse black" for the acetate rayon which would produce the effect of a spaced-dyed yarn part yellow and part black. Further, if one of the strands A and B were formed of orlon and the other of nylon, the nylon might be dyed with an "acid red" and the orlon with a "basic grey." The effect here would be a spaced-dyed yarn, part red and part grey.

The fibrous strands A and B may be formed of suitably chosen materials which are pre-dyed before being formed into the composite yarn. Pre-dyeing would also produce a yarn having segments of different colors or shades. In this case, it would be possible to form strands A and B of the same material which is pre-dyed different colors or shades and then formed into yarn Y. Further, fibrous strands A and B may be formed of suitably chosen materials which have affinities for the same dye, but one material has a greater affinity than the other material such that it will be dyed a deeper shade than the other material which is dyed a lighter shade.

It will therefore be apparent that a novel composite textile yarn and method of manufacturing the same are provided wherein sectional portions have different characteristics from other sectional portions providing a distinctive appearance.

In the drawings and specification there has been set forth a preferred embodiment of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. A composite textile yarn comprising predetermined lengths of a first fibrous strand having predetermined characteristics alternating with predetermined lengths of at least one other fibrous strand having different characteristics therefrom, said predetermined lengths being overlapped only at their proximal end portions and said proximal end portions being intertwisted to form said lengths into a continuous yarn.

2. A composite textile yarn comprising predetermined lengths of a first fibrous strand having predetermined characteristics alternating predetermined lengths of at least one other fibrous strand having different characteristics therefrom, said predetermined lengths of said strands being overlapped only at the proximal end portions thereof and said proximal end portions being intertwisted to form said lengths into a continuous yarn, said overlapped and intertwisted portions being of lesser length than the predetermined lengths of said strands therebetween.

3. The structure set forth in claim 2 wherein at least some of the predetermined lengths of said first strand are of the same length as at least some of the predetermined lengths of said at least one other strand.

4. The structure set forth in claim 2 wherein at least some of the predetermined lengths of said first strand are of a different length from at least some of the predetermined lengths of said at least one other strand.

5. A composite textile yarn comprising varying predetermined lengths of a first fibrous strand having predetermined characteristics alternating with varying predetermined lengths of at least one other fibrous strand having different characteristics therefrom, said predetermined lengths of said strands being overlapped only at the proximal end portions thereof and said proximal end portions being intertwisted to form said varying lengths into a continuous yarn.

6. A composite textile yarn comprising predetermined lengths of a first fibrous strand having a predetermined dye affinity alternating with predetermined lengths of at least one other fibrous strand having a different dye affinity from said first strand, said predetermined lengths being overlapped only at their proximal end portions and said proximal end portions being intertwisted to form said lengths into a continuous yarn.

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