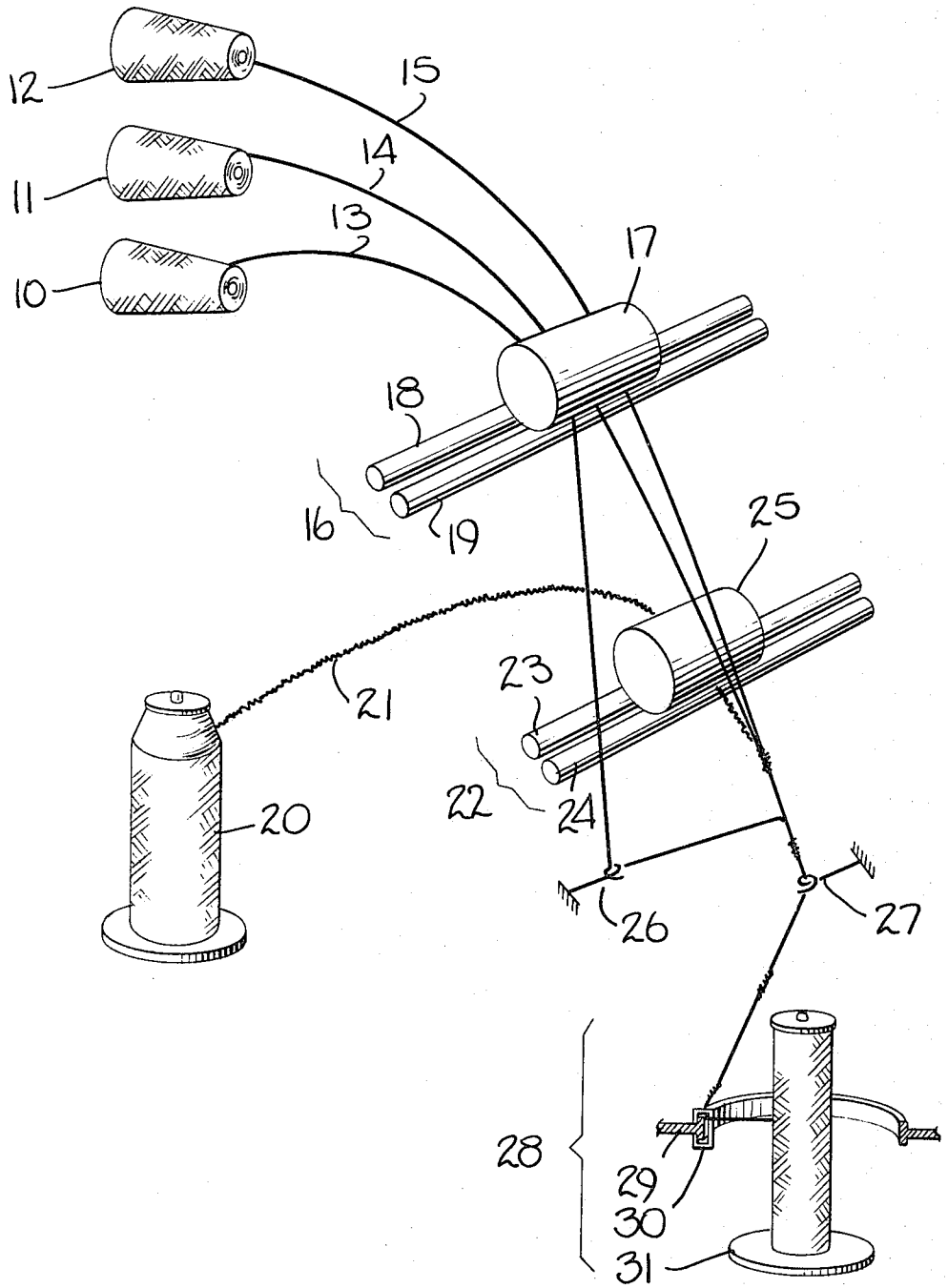
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SILKLIKE SLUB YARN AND METHOD OF MAKING SAME

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SILKLIKE SLUB YARN AND METHOD OF MAKING SAME

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ABSTRACT OF THE DISCLOSURE

A novel slublike yarn is produced by forwarding at least two ends of pre-formed yarn to a twist zone while simultaneously feeding to the twist zone at a lesser speed a roving whereby the roving is pulled apart into discrete slublike segments and because of the twisting together of the pre-formed yarn ends the discrete slublike segments of roving are locked in place.

This invention relates to a method and apparatus for making novelty yarns. More specifically, this invention relates to a method and apparatus for making silklike slub yarns. Furthermore, this invention relates to the novelty yarns themselves.

The method and apparatus of the present invention permits of a continuous unitary operation. The novelty yarn itself is especially desirable because the slubs are very firmly fixed; furthermore, the yarn has a highly pleasing appearance and can be made into fine silklike fabrics.

In accordance with the present invention, there is provided a method of producing a novelty yarn comprising feeding at least one roving together with at least two ends of pre-formed yarn through a twist zone, said roving being fed at a lesser speed than said pre-formed yarn ends, and twisting together said pre-formed yarn ends and said roving in said twist zone, whereby said yarn ends due to their greater speed than the speed of said roving intermittently pull said roving apart into discrete segments and whereby there is produced a novelty yarn comprising the pre-formed yarn ends twisted about and holding in place slublike segments of roving. In a preferred embodiment of the present invention, the method further comprises twisting at least one additional pre-formed yarn end about the roving and the other pre-formed yarn ends after said roving and other pre-formed yarn ends have been at least partially twisted, whereby each additional pre-formed yarn end is also twisted about said slublike, discrete segments of roving and thereby also holds said segments in place.

Since the amount of twist imposed in the twist zone will be dependent in part upon the denier or count of the pre-formed yarn ends, the amount of twist preferably is defined in terms of "twist multiplier." "Twist multiplier" is the dimensionless number which is calculated by dividing the number of turns per inch by the square root of the cotton count of a pre-formed yarn end. It is preferred that the twist multiplier be about ½ to 5 and most preferred that it be about 1½ to 2½.

In a still more preferred embodiment of the method, said additional pre-formed yarn end is twisted about said roving and other pre-formed yarn ends in said twist zone after said roving and other preformed yarn ends have been completely twisted.

When one or more additional pre-formed yarn ends are used, it is preferred that the "twist frequency" (number of turns of twist per inch) of the roving and initial preformed yarn ends, considered together as a unit, with the additional pre-formed yarn ends be approximately no greater than the twist frequency of the roving with the initial yarn ends; it is most preferred that the ratio of

the latter twist frequency to the former twist frequency be about 1:1 to 4:1.

It is preferred that the ratio of the feeding speed of the pre-formed yarn ends to the feeding speed of the roving be from about 2:1 to 1000:1 and most preferred from about 5:1 to 50:1 in order that the roving be adequately pulled apart to form discrete, slublike segments but yet not be pulled too much apart to produce an aesthetically pleasing yarn.

There is also provided in accordance with the present invention apparatus for producing a novelty yarn comprising a first set of feed rolls for feeding at least two ends of pre-formed yarn, a second set of feed rolls for feeding roving between said pre-formed yarn ends at a slower speed than said yarn ends, and a twister spindle for twisting said yarn ends and roving together whereby said yarn ends due to their greater speed than the speed of the roving pull the roving apart into discrete segments and whereby there is formed a novelty yarn comprising the pre-formed yarn ends twisted about and holding in place slublike, discrete segments of roving.

In further accordance with the present invention, there is provided a novelty yarn comprising at least two ends of pre-formed yarn twisted and thereby interlocked together with discrete, slublike segments of roving. The twist multiplier is preferably about ½ to 5 and most preferably about 1½ to 2½. In a preferred embodiment, the novelty yarn further comprises at least one additional pre-formed yarn end twisted with the twisted roving and initial preformed yarn ends at a twist frequency approximately no greater than the twist frequency of said roving and initial pre-formed yarn ends; it is still further preferred that the ratio of the latter twist frequency to the former twist frequency be from about 1:1 to 4:1.

It will be understood that a pre-formed yarn end may comprise a continuous filament yarn made up of one or more continuous filiments which may or may not be twisted or it may comprise a spun yarn composed of staple fibers.

The drawing shows a specific embodiment of the present invention.

The invention will now be further described by reference to the drawing as follows:

From packages **10**, **11** and **12** carrying pre-formed yarn ends **13**, **14** and **15**, respectively, said yarn ends are withdrawn by feed roll **16**. Feed roll **16** consists of driven rolls **18** and **19** and presser roll **17** which is in nipping relation to rolls **18** and **19**. Said pre-formed yarn ends **13**, **14** and **15** pass between the nip of rolls **17** and **18** and the nip of rolls **17** and **19**. Downstream of feed rolls **16** is an identical set of feed rolls **22**. Feed rolls **22** consist of driven rolls **23** and **24** and presser roll **25** in nipping relation to rolls **23** and **24**. Pre-formed yarn ends **13**, **14** and **15** bypass the nips of feed rolls **22** but yarn ends **14** and **15** contact the top of roll **25** which thereby acts as a means for preventing twist applied downstream from proceeding further upstream, i.e., "twist holdback means." From supply package **20** roving **21** passes between the nip of rolls **23** and **25** and rolls **24** and **25** and downstream of feed rolls **22** is inserted between preformed yarn ends **14** and **15**. Pre-formed yarn ends **14** and **15** pass through guide **27** and therefrom to twister spindle **28**; twister spindle **28** comprises bobbin **31**, traveler ring **29** and traveler **30**. By the action of twister spindle **28**, roving **21** is twisted initially with yarn ends **14** and **15** after being inserted therebetween; therefrom the twisting action continues down to twister spindle **28**. Downstream of rolls **22** pre-formed yarn end **13**, which has been diverted by guide **26**, is introduced into the twisting zone. Pre-formed yarn ends **13**, **14** and **15** are fed at a higher speed than roving **21** so that during the twisting operation said pre-formed yarn ends due to their

higher speed than said roving pull said roving apart into discrete, slub-like segments which are held in place by the twists. Guides **26** and supply package **10** carrying yarn end **13** may be omitted if the extra tight holding of the slubs by the additional yarn end is not desired.

The invention will now be further described by reference to the following example:

EXAMPLE

According to the present invention, there is made a novelty yarn using an apparatus as illustrated in the drawing. The steps involved are as follows: Two continuous filament pre-formed yarn ends ("initial pre-formed yarn ends"), each 40 filament, 200 total denier, 2 turns per inch of Z-twist (i.e., 200/2Z/40) cellulose acetate are passed through the nips between roll **17** and rolls **18** and **19**. (It should be noted that, of course, any twist in a pre-formed yarn end is simply part of the pre-formed yarn end and does not enter into determinations of twist imposed in making the novelty yarns of the present invention.) A 3.0 hank polyethylene terephthalate staple roving is passed through the nips between roll **25** and rolls **23** and **24** and fed thereby between the two cellulose acetate yarn ends. The ratio of the feeding speed of said two cellulose acetate yarn ends (i.e., the linear velocity of the surface of rolls **18** and **19**) to the feeding speed of said roving (i.e., the linear velocity of the surface of rolls **23** and **24**) is 40:1. An additional yarn end, 20 filament, 75 total denier, 2 turns per inch of Z-twist (i.e., 75/2Z/20) cellulose acetate, is passed through the nips between roll **17** and rolls **18** and **19**, then diverted by guide **26** and tied into the cellulose acetate yarn ends, then passed through conventional twister frame spindle guide **27** and therefrom passed to conventional twister spindle **28**. Guide **26** is located approximately midway between feed rolls **22** and guide **27** and about four inches transversely from the line of travel of the cellulose acetate yarn ends. The twist thereby imposed is 5.0 turns per inch.

It is to be understood that the above description is given merely by way of illustration of the present invention and that modifications and variations within the spirit and scope of the invention may be obvious to those of ordinary skill in the art.

The embodiments of the inventions in which an exclusive property or privilege is claimed are defined as follows:

1. Method of producing a novelty yarn comprising feeding at least two ends of preformed yarn to a twist zone feeding at least one roving together with said at least two ends of pre-formed yarn to said twist zone, said roving being fed at a lesser speed than said pre-formed yarn ends, and twisting together said pre-formed yarn ends and said roving in said twist zone, whereby said yarn ends due to their greater speed than the speed of said roving intermittently pull said roving apart into discrete segments and whereby there is formed a novelty yarn comprising the pre-formed yarn ends twisted about and holding in place slub-like, discrete segments of roving.

2. The method of claim **1**, wherein the total extent of twisting in said twist zone imposes a twist multiplier of about ½ to 5.

3. The method of claim **2**, wherein the ratio of the feeding speed of the pre-formed yarn ends to the feeding speed of the roving is from about 2:1 to 1000:1.

4. The methods of claim **1**, further comprising twisting at least one additional pre-formed yarn end about the roving and the other pre-formed yarn ends after said roving and other pre-formed yarn ends have been at least partially twisted, whereby each additional pre-formed yarn end is also twisted about said slub-like discrete segments of roving and thereby also holds said segments in place.

5. The method of claim **3**, wherein the extent of twisting imposes a twist frequency on the roving and other pre-formed yarn ends, considered together as a unit, with the additional pre-formed yarn ends approximately no greater than the twist frequency of said roving and other pre-formed yarn ends if considered alone.

6. The method of claim **5**, wherein the ratio of the last named twist frequencies to the first named twist frequency is about 1:1 to 4:1.

7. A novelty yarn comprising at least two ends of pre-formed yarn twisted and thereby interlocked together with discrete, slub-like segments of roving, and at least one additional pre-formed yarn end twisted with the roving and other pre-formed yarn ends, thus further locking said discrete, slub-like segments of roving, the amount of twist in said novelty yarn being defined by a twist multiplier of from about ½ to about 5, and the twist frequency of said novelty yarn being no greater than the twist frequency of a yarn comprising only the pre-formed yarn ends and the discrete, slub-like segments of roving.

8. The novelty yarn of claim **7** wherein the ratio of the twist frequency of said novelty yarn to the twist frequency of a yarn comprising only the pre-formed yarn ends and the discrete slub-like segments of roving is from about 1:1 to about 1:4.

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