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PROCESS FOR PRODUCING NOVELTY YARNS

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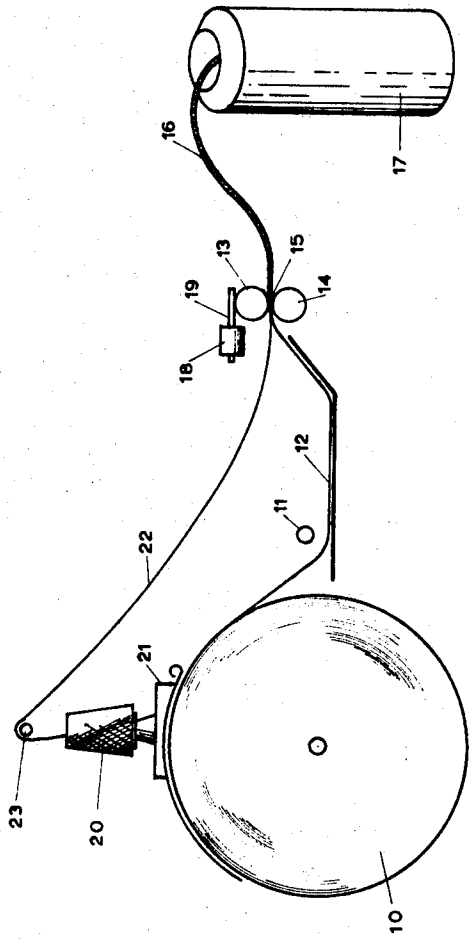


FIG. 1

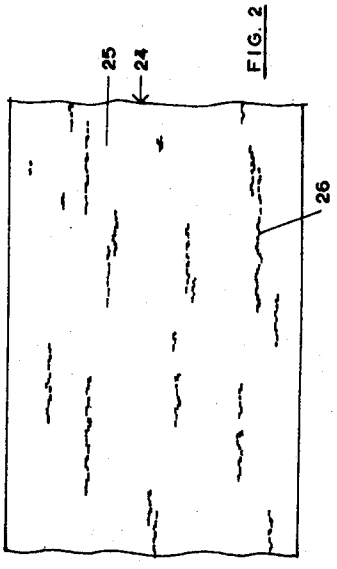


FIG. 2

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PROCESS FOR PRODUCING NOVELTY YARNS

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ABSTRACT OF THE DISCLOSURE

Slub or nep effects or the like in yarns and fabrics are obtained by simultaneously running a fibrous carded web and yarn through the nip of rotating crush rolls and adjusting the relative surface pressure at said nip sufficiently to break the yarn into segments and inject such segments into the body of the fibrous web at intervals therealong.

This invention relates to a process for the manufacture of novelty yarns or fabrics and, more particularly, to obtaining the same as by means of injecting slubs or neps of foreign fibers into a card web, for example, through the use of crush rolls on cotton type carding apparatus.

One object of the invention is a method of injecting into the fibrous body of the web, a fiber of different characteristics such as to create therein neps, slubs or splashes in the resulting yarn and fabrics made therefrom. A further object is the production of such neps, slubs and/or splashes obtained by injecting a second fiber of either different characteristics and/or chemical properties. Fibers of different physical characteristics tend to give a different textured appearance, while fibers composed of different chemical characteristics are disposed to crossdye differentially, resulting therefore in unusual color combinations in such yarns and fabrics.

In recent years many textile equipment manufacturers have designed cotton carding machines to operate and coact with what are called crush type rolls, to improve the processing performance of the cotton fiber web as it comes out of, or is discharged from such carding machines. By applying sufficient pressures to the crush rolls, various seed particles and/or particles of other vegetable matters caught in the web are crushed or disintegrated to such an extent that these foreign materials are thereby enabled to fall out of the fiber mass during the subsequent manufacturing processes. The addition of such crush rolls has been found not to affect, damage, or otherwise injure the fibrous web passing through the carding machine, but any object greater in size than the fiber is crushed or mashed by the pressures applied to these rolls.

Conventionally, slubs or neps or splash effects are usually produced by blending the same in blending hoppers, or by producing these novelty effects with a mechanical slub attachment mounted on a spinning frame. According to the new process disclosed herein however, a new product is evolved comprising slubs or neps of a very different character, and of a much greater variety than those heretofore produced on such conventional equipment.

According to one embodiment of the present invention, such novelty yarn and fabric effects may be obtained by passing strands of yarn of a foreign fiber along with the web produced on a cotton card through the crush rolls of a cotton carding machine, whereby the strands of such yarn are broken into segments of random various lengths. These segments are thereupon deposited onto the web of fibers that is being processed on the card.

In the subsequent processes of drafting, the broken yarn segments are distributed at random along the axis of the yarn, thus producing slubs, neps, splashes and the like in the yarn. By using yarns of different dyeing characteristics, a yarn is made which exhibits slubs and neps and splashes of contrasting color.

More particularly, if a spun yarn, or a filament yarn, or roving, is passed through the nip of the crush rolls along with the fibrous web, such yarn will be crushed and broken into various length segments, by reason of the fact that it is many times larger than the individual cotton fibers in such web. Moreover, since these segments of yarn discharged from the crush rolls are themselves of a fibrous nature, it has been found that they follow along with the other smaller fibers making up the web per se. That is to say, these random disconnected broken yarn segments do not fall out in subsequent processing of the yarn, as do seed particles and other relatively heavy vegetable compositions of matter. On the contrary, these yarn segments remain in the strand to subsequently appear as the neps, slubs, or splashes in the yarn thus prepared, and in fabrics subsequently fabricated therefrom, all as above described.

By using different numbers of strands of yarn, combinations of yarns of various characteristics, and also by varying the amounts of surface pressure applied to the crush rolls, many interesting novelty effects can be obtained.

It is important herein to note that according to normal blending procedures for the production of novelty yarns comprising neps, slubs and splashes, an undesired result is frequently the appearance of what are called filling bands which are said to result from the inability of present day mill blending equipment and methods to distribute the nubs, slubs and splashes uniformly throughout the web mass. Here, however, according to the present invention, the strand material which goes to make up such novelty effects is superimposed upon the web coming off the doffer of the card instead of being blended therein prior to its exit from the carding machine.

With the above and other objects in view, as will be apparent, the present invention consists in the construction, combination, and arrangement of parts and/or steps, all as hereinafter more fully described, claimed and illustrated in the accompanying drawings wherein:

FIG. 1 comprises a diagrammatic illustration of suitable apparatus for practising the steps of one embodiment of the present method; and

FIG. 2 is intended to represent a plan view of a relatively small piece or swatch of a woven fabric exhibiting the novelty effects of the present invention in the form of slubs, neps, or splash characteristics.

One example of practising the present invention may be described briefly, in conjunction with the two figures of the drawings above identified, as follows. A 40" cotton card machine having a doffer **10** and a doffer comb **11** for transferring a web of rayon fibers **12** may be constructed and arranged to co-operate and coact with a pair of Crosrol-Varga crush type rolls or crush rolls **13** and **14** through the nip **15** of which the web **12** being processed is passed to remove therefrom vegetable particles and any other deleterious compositions or substances that should be eliminated from the web **12** being processed before it proceeds in the form of a sliver **16** to the coiler **17**.

It will be understood, of course, that by changing the amount of surface pressure formed at the nip **15** of the crush rolls **13**, **14**, different length yarn slubs, neps and splash effects will result. Convenient means for adjusting such surface pressures may comprise a weight arm **18** suspended over or projecting from the crush roll assembly with suitable means for moving the weight element thereof along the shaft **19** of said weight device **18**, thereby varying the effect of said weight **18**, and correspondingly altering the surface pressure disposed at the nip **15** of the coacting crush rolls **13**, **14**. According to the present example, the weighting arrangement of the crush roll unit

may be adjusted so as to indicate "4" on the weight arm. A 14 oz. 100% viscose rayon lap is fed to the card (not shown), with the card speeds and drafts also being adjusted in such manner as to produce a 60 grain sliver.

While the card is actually producing the rayon web, thus described, a group of three 9°30′ cones **20** of 14/2 100% acetate yarns is positioned on any convenient base or support **21** on top of the card doffer **10**. All of the three yarns **22** are simultaneously led off their respective cones **20** and over the guide bar or yarn support **23** placed directly above the cones **20**. The three yarn strands **22** are fed, along with the web **12**, through the nip **15** of the crush rolls **13**, **14** of the card assembly. The yarns **22** thereupon become broken into individually distinct random segments which are deposited in the rayon web **12** being processed.

Eight ends of the sliver **16** may then be fed to a Whitin Even-draft draw frame according to the breaker process. The sliver from the draw frame is processed into a .60 hank roving, and the roving subsequently spun into a 15/1 yarn, which yarn is or may be dyed with rayon type dyestuff. The slubs and neps do not dye, which is to say, they are not affected by the rayon type dyestuff by reason of their different chemical characteristics since they are of acetate derivation or composition. For this reason, the slubs, neps or splashes of acetate nature thus injected into the rayon web stand out in visual contrast to the body of the yarn which is made from such web. This effect is intended to be illustrated or indicated in FIG. 2 comprising a relatively small swatch of cloth **24** woven or otherwise fabricated from rayon or viscose yarns **25** and contrasting random spaced injected slubs, neps or splashes **26** of acetate, which may be considered the product of the present process.

As will be understood, this process is designed so as to enable the use of a variety of raw materials. Combinations of fibers of widely different characteristics generally give better visual effects than combinations of fibers of similar characteristics. Thus, for example, acetate yarns fed onto a rayon card web (as described in detail in the foregoing example) give excellent results. Furthermore, yarns containing acetate nubs and silk nubs have been found to give unusual effects when fed onto a cotton or rayon web.

It will also be understood that by varying a number of strands of yarn fed onto the web, there will be obtained corresponding variations in the number of slubs or neps or splashes contained in the final yarn. It is also to be noted that, according to the present invention, slubs, neps or splashes of varying length and size are to be obtained, such that those of the larger type appear to be twisted in the direction of the novelty yarn being produced, thereby simulating or giving a mock twist appearance; whilst those of the smaller size or length are of such constitution that they resemble or give a soft, pebble effect.

What is claimed is:

1. A process for the production of novelty yarn effects comprising the steps of forming a web of fibers on a card, said fibers having predetermined characteristics, doffing the formed web from the card and passing it through the nip of a pair of rotating crush rolls while simultaneously passing at least one yarn of continuous length, made of fiber having at least one characteristic different from said predetermined characteristics of the fibers of the web, through the same nip of said crush rolls, the relative surface pressure of the rolls at said nip being sufficient to break the yarn into segments in the fibrous body of the web at intervals therealong.

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