Feb. 15, 1966 E. H. SHATTUCK 3,234,624

METHOD AND APPARATUS FOR MAKING LIMITED STRETCH BULKED YARN

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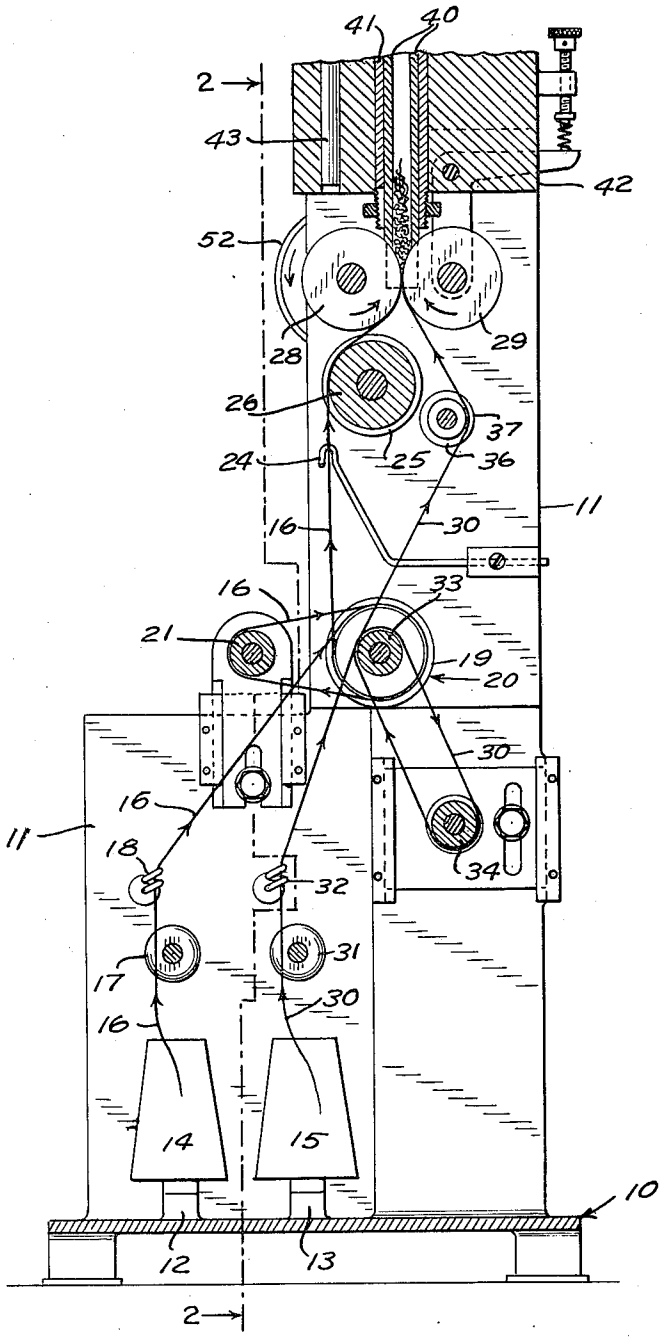


Fig. 1.

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Fig. 2.

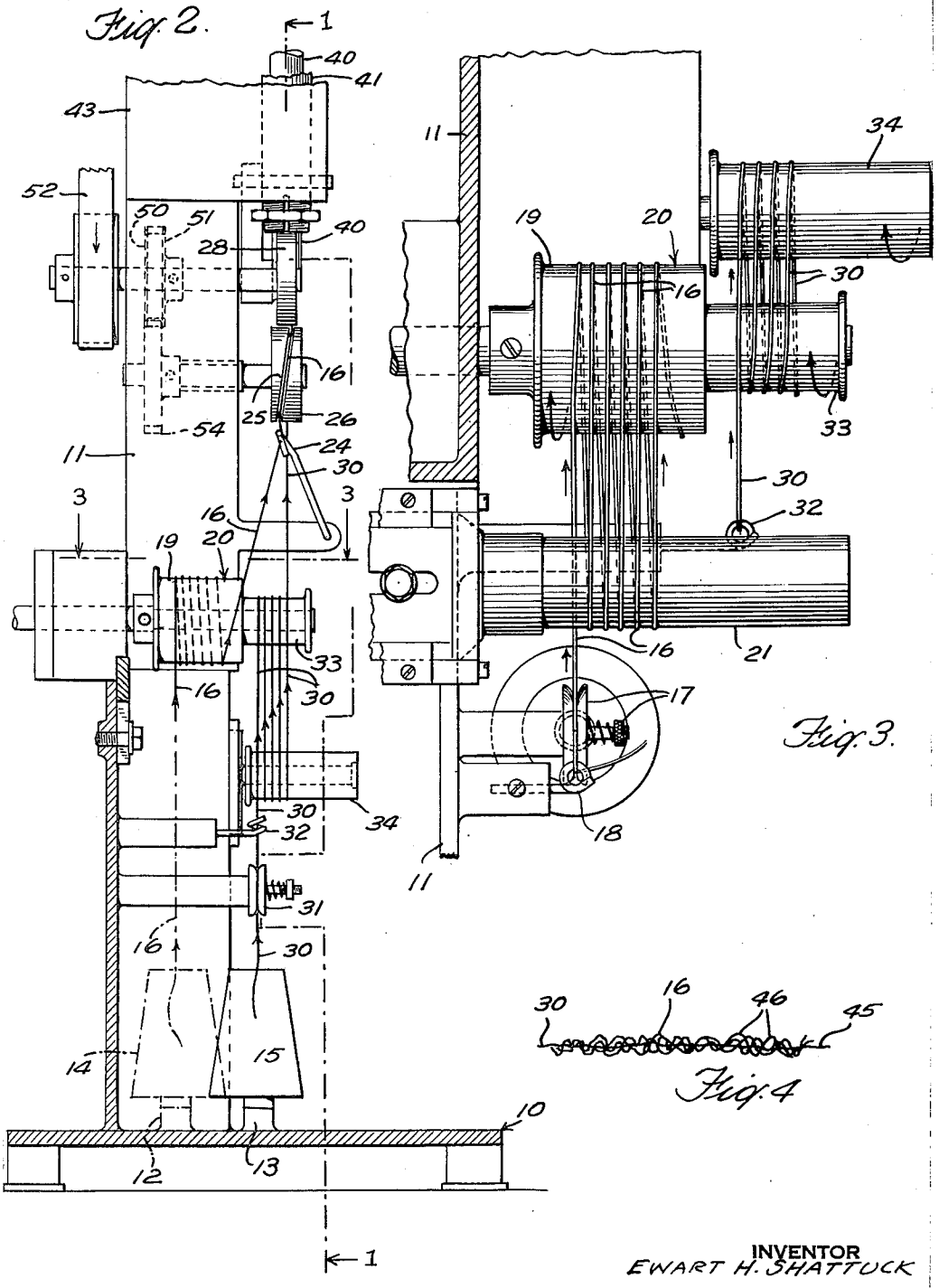


Fig. 3.

Fig. 4

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METHOD AND APPARATUS FOR MAKING LIMITED STRETCH BULKED YARN

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5 Claims. (Cl. 28—1)

This invention relates to the production of limited stretch bulked yarn and has for an object to provide novel and improved method and apparatus for producing such yarn.

Another object is to provide means for producing a bulked yarn composed of a plurality of plies having different degrees of bulk.

Another object is to provide means for producing a yarn of the above type in a stuffer crimper.

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

In accordance with the present invention a pair of ends, which may be in the form of bundles of continuous filaments in twisted or untwisted state, are fed at different rates into a stuffer crimper wherein the ends are bulked. When the ends are thus fed at different rates the one which is fed at the slower rate becomes the core yarn and the end which is fed at the higher rate becomes bulked around the core yarn to constitute the effect yarn. The relative amount of crimp in the two ends depends upon the relative rates of feed and may be varied in accordance with the overall effect desired. The bulk of the plied yarn thus depends largely upon the characteristics of the effect yarn and the stretch characteristic depends largely upon the characteristics of the core yarn.

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

In the drawings:

FIGURE 1 is a vertical section taken on the line 1—1 of FIG. 2 illustrating an apparatus for carrying out the present invention;

FIG. 2 is a vertical section taken on the line 2—2 of FIG. 1;

FIG. 3 is a partial plan section taken on the line 3—3 of FIG. 2 but on a larger scale; and

FIG. 4 is a diagrammatic representation of a product obtained from the apparatus of FIGS. 1 to 3.

Referring to the drawings more in detail the invention is shown as embodied in an apparatus comprising a base 10 carrying an upright bracket 11 and having pins 12 and 13 on which cops 14 and 15 are supported. The yarn 16 from the cop 14 is fed through a tension member 17 and guide 18 onto the larger diameter portion 19 of a stepped roll 20, thence in a plurality of convolutions around a spaced idler roll 21. From the roll 20 the yarn 16 passes through a guide 24 to an inclined peripheral groove 25 in a traversing guide roll 26, thence into the bite between a pair of feed rolls 28 and 29.

The yarn 30 from the cop 15 is fed through a tension member 31 and guide 32 around the smaller diameter portion 33 of the stepped roll 20, thence in a plurality of convolutions around spaced idler roll 34. From the roll 20 the yarn 30 passes into a peripheral groove 36 in a guide roll 37 to the bite between the feed rolls 28 and 29.

The feed rolls 28 and 29 feed the yarns 16 and 30 into a tube 40 which constitutes a stuffer crimper chamber of the usual type. The tube 40 is secured in a fixed

tube 41 positioned in the bore of a block 42 carrying heating means such as a heater rod 43. The bulked ends are withdrawn from the delivery end of the tube 40 as a plied yarn and may be twisted if desired.

The plied yarn as shown in FIG. 4 comprises a core yarn 30 which is relatively straight with a crimp 45 of low amplitude, and the effect yarn 16 which is more highly bulked with a crimp 46 of higher amplitude which is formed as the end 16 is fed back and forth by the traversing roll 26. The ends may be twisted and heat set for retaining their core and effect form, or may be bonded together by suitable means.

The feed rolls 28 and 29 are interconnected by gears 50 and 51 and are driven by a pulley thru a belt 52 from a motor not shown. The gear 51 also drives the traversing roll 26 by a gear 54. The stepped roll 20 may be driven at a fixed ratio to the feed rolls 28 and 29 by gear connections not shown.

It will be noted that the overfeed of the end 16 with respect to the end 30, together with the traversing guide 26 causes the end 16 to feed back and forth transversely of the end 30 as it is crimped to a highly bulked state. The bulk of the product is thus determined by the state of the effect yarn 16 while the stretch is determined by the crimp amplitude of the core yarn 30. The two ends, each of which constitutes a bundle of filaments, are thus entangled to form a blended yarn wherein the various filaments are interleaved to form a unitary bundle wherein strip-back or separation of the ends is prevented due to the entangling of the filaments. While the ends have been referred to as plied together it is to be understood that the resulting yarn may be considered as a single yarn since the individual yarns have lost their identity due to the plying or entangling operation.

What is claimed is:

1. The method of making a limited stretch bulked yarn composed of a plurality of plies which comprises introducing said plies together into a stuffer crimping zone while feeding one of said plies to said zone at a predetermined fixed rate adapted to produce a low amplitude crimp therein and feeding the other of said plies to said zone with a traversing movement adapted to lay the latter ply back and forth across the first ply to form a highly bulked effect yarn.

2. The method of making a limited stretch bulked yarn composed of a plurality of plies which comprises introducing said plies together into a stuffer crimping zone while feeding one of said plies to said zone at a predetermined fixed rate adapted to produce a low amplitude crimp therein and feeding the other of said plies to said zone with a traversing movement adapted to lay the latter ply back and forth across the first ply to form a highly bulked effect yarn and heat setting and twisting said yarn.

3. Apparatus for producing a limited stretch bulked yarn comprising a stuffer crimper having a crimping chamber and feed rolls adapted to feed yarn thereto for crimping, means feeding a yarn end to said feed rolls at a predetermined rate, and means feeding a second yarn end to said feed rolls for plying with said first end at a different predetermined rate whereby one of said ends is overfed with respect to the other of said ends and becomes more highly bulked in said crimper.

4. Apparatus as set forth in claim 3 including a traversing guide means for feeding said overfed end to said feed rolls with a traversing movement.

5. Apparatus as set forth in claim 3 in which said feed means comprises a stepped roll having feed portions of

different diameters around which the respective ends are fed.

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