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APPARATUS AND METHOD OF PRODUCING FANCY YARNS

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Fig. 1.

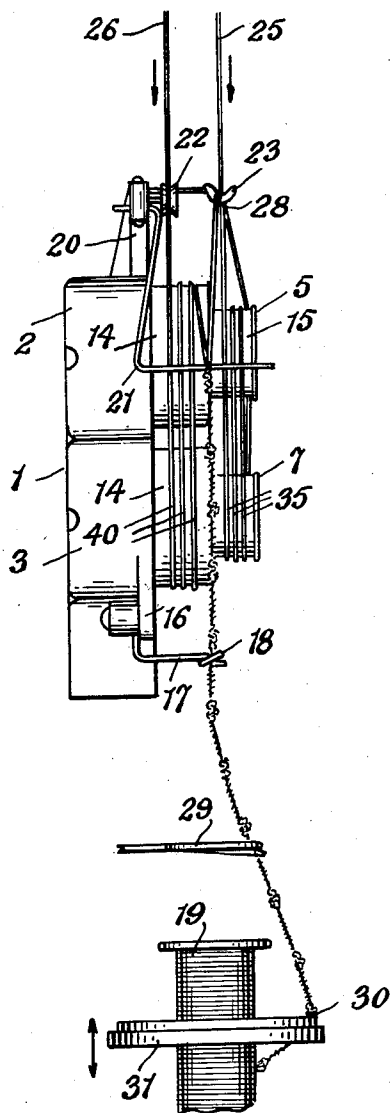
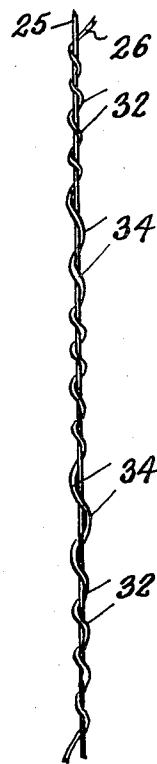


Fig. 6.



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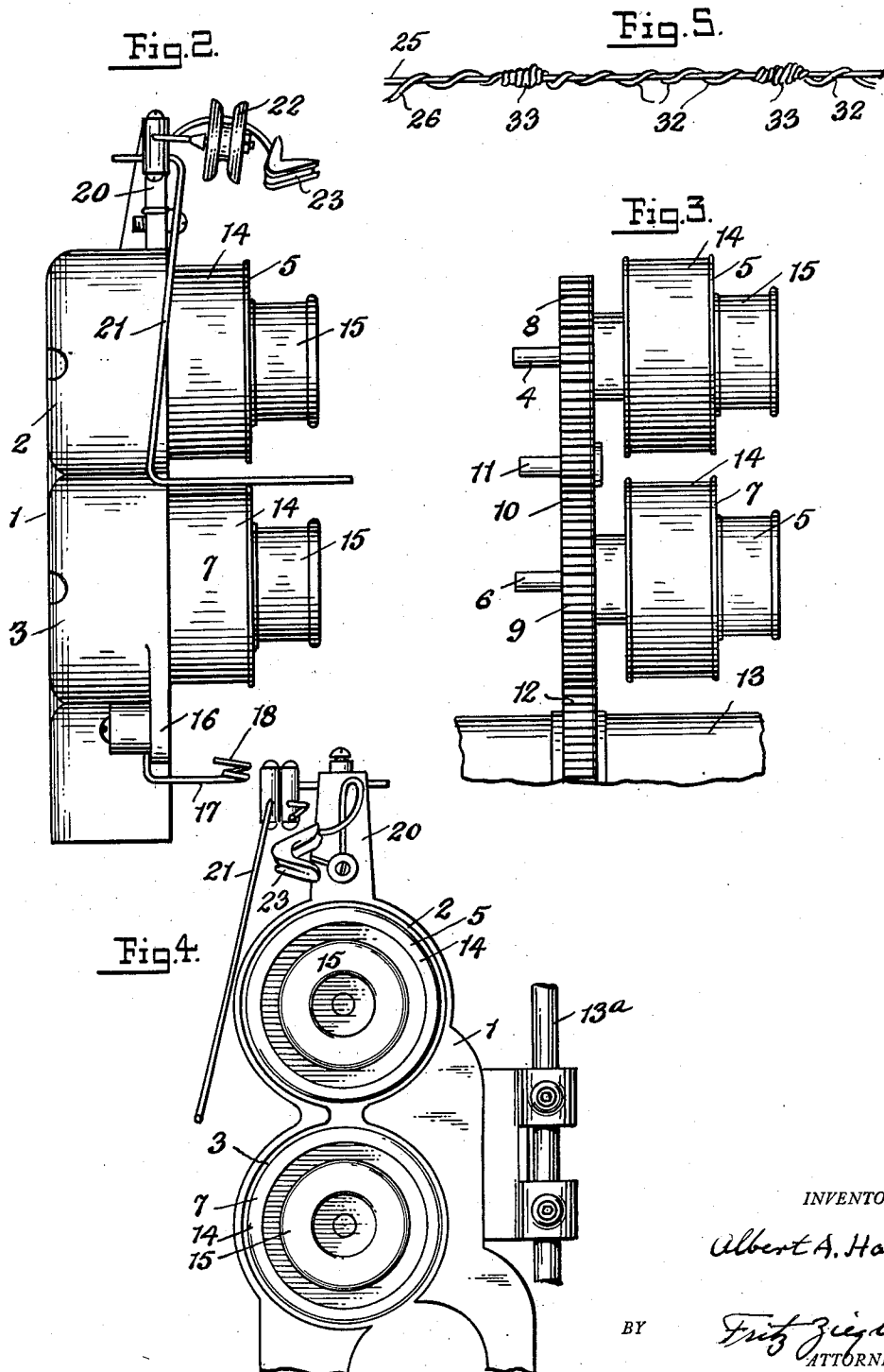
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APPARATUS AND METHOD OF PRODUCING FANCY YARNS

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8 Claims. (Cl. 57—91)

This invention relates to the production of so-called "fancy" yarns, and particularly to those produced by a twisting operation and by the securing of irregularities in the twist, producing in some instances, enlargements or nubs along the length of the yarn at either regular or irregular intervals.

In the production of yarns of this character, it is often found desirable to produce the nubs or irregularities in the yarn at irregular intervals, thus avoiding the production of so-called "windows" in the woven fabric formed of such yarns. In order to produce the nubs at varying distances apart in the yarn, it is desirable to provide simple means in the twisting mechanism by which adjustments can be made very readily in order to vary the type of twist and the type of irregularity secured in the yarn, including the spacing of the irregularities therein.

It is therefore one of the objects of the present invention to provide a means and method for twisting yarn in a manner to enable many fancy yarn effects to be attained with a minimum of adjustment of the parts of the apparatus.

It is another object of the invention to provide means readily applicable or adaptable to conventional yarn-twisting apparatus, for producing fancy yarns of the character above described.

It is still another object of the invention to provide means by which control over the type of yarn to be produced can be readily exercised; by which the production of the fancy yarn will be rapid and economical and by which a multitude of different ornamental effects in the yarn can be easily produced.

With these and other objects to be hereinafter set forth in view, I have devised the arrangement of parts to be described and more particularly pointed out in the claims appended hereto.

In the accompanying drawings, wherein an illustrative embodiment of the invention is disclosed,

Fig. 1 is a front elevation of the parts of the twisting apparatus which produce the fancy yarns, diagrammatically illustrating the manner in which a type of fancy yarn can be produced according to the present invention;

Fig. 2 is a front elevation of the varying-diameter rolls and associated parts;

Fig. 3 shows the rolls with the housing removed in order to disclose the driving gears;

Fig. 4 is a view of the apparatus shown in Fig. 2, looking from the right of the latter figure;

Fig. 5 is a view of a short section of one of the fancy yarns which can be made by the improved twisting apparatus, and

Fig. 6 is a similar view of another style of yarn readily produced by the apparatus.

Referring to the drawings, 1 indicates a metal housing which supports the rolls around which the threads or "ends" that produce the yarn are extended. The housing is provided with the upper and lower cylindrical chambers, indicated respectively at 2 and 3. The chamber indi-

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cated at 2 supports the shaft 4 of the upper roll generally indicated at 5. The lower chamber indicated at 3 supports the shaft 6 of the lower roll generally indicated at 7. The two rolls 5 and 7 are of similar size and are rotated in the same direction and at the same speed. For this purpose the roll 5 carries a gear 8, while a similar gear shown at 9 is carried by the roll 7, the gears 8 and 9 being in mesh with an idler gear 10 rotatable on shaft 11 supported by the housing 1. The gear 9 is in mesh with a gear 12 mounted on the drive shaft 13 which extends for the length of the twisting machine, and the housing 1 is mounted over the drive shaft and supported on the post 13a, in a manner to maintain the gear 9 in mesh with the drive-shaft gear 12. This arrangement is such that when the drive shaft 13 is rotated, its gear 12 will rotate the gear 9 and thus rotate the roll 7 carried thereby. The gear 9 will rotate the idler gear 10 which will in turn rotate the gear 8 and thus rotate the gear 5. Thus, through this arrangement, both rolls 5 and 7 will be rotated in the same direction and at the same rate of rotational speed.

Each of the rolls 5 and 7 is provided with a large-diameter portion 14 and a smaller-diameter portion 15 extending forwardly thereof. These parts 14 and 15 can be formed integrally or made in one piece, or if desired they can be separable and capable of securingment together in a manner to enable substitutions of different diameters to be readily made according to the effects sought in the twisted yarns. Adjacent to its lower end, the housing 1 is formed with an ear 16 to which is secured a pivotally adjustable wire finger 17 terminating in a guide loop or pigtail 18 through which the twisted yarn passes on its way to the wind-up spool or reel indicated at 19. At its upper end, the housing 1 is provided with a vertical post 20 which carries a pivotally adjustable tension finger 21, a guide roll 22 and a V-guide 23, these parts being adjustable for required positioning and to secure the desired tension of the threads in the known manner.

By reference to the structure disclosed in Fig. 1, the manner in which the fancy yarn is produced will be readily understood. The base or core thread is indicated at 25, and the same is guided downwardly through suitable guide means of the conventional form generally employed in yarn-twisting machines, from a suitable source of supply such as a properly-positioned cone or spool. The wrapping thread is indicated at 26 and the same is also brought downwardly, through suitable guiding means, from a cone, spool or other suitable source of supply.

In the arrangement shown in Fig. 1, the core thread 25 is given several turns as shown at 35, around the small-diameter portions 15 of the two rolls 5 and 7, and is then extended over the V-guide 23, as indicated at 28, from whence it is directed downwardly and forwardly of the tension-applying finger 21. The wrapping thread 26 extends downwardly and is given several turns as shown at 40 about the large-diameter parts 14 of the two rolls 5 and 7, then extending behind the tension-applying finger 21. The position of the tension finger 21 can be varied, and various effects are attained in the twisted yarn by changes in the position of this finger. The twisted yarn extends downwardly through the eye or pigtail loop 18; through the guide loop 29, to the traveller 30 mounted on the ring 31, and is thence taken up by the rotated reel or spool 19.

The yarn shown in Fig. 5 is illustrative of only one of the many effects attained by the use of the described apparatus. It will be noted in Fig. 5 that in the form there shown, the wrapper thread 26 is regularly wrapped or twisted about the core thread 25 in the areas indicated at 32, while at the points designated at 33, nubs or bunch-

ings of the wrapping thread have been obtained. One of the reasons for the securement of these nubs or bunchings is that the wrapper thread 26, when extended about the large-diameter portions of the rolls 5 and 7, will, during the rotative movement of these rolls, tend to slip. During such slippage a slowing up of travel of the wrapper thread will take place with a resultant build-up of slack in said thread, resulting in a bunching of the wrapper thread about the core thread 25, and thus resulting in the formation of one of the nubs or bunchings 33. As the wrapper thread loses its slack and tightens or becomes taut with the formation of one of the nubs or bunchings, its slippage on the rolls 5 and 7 will be reduced and its travel then becomes normal, with the result that the conventional regular windings shown at 32 will then take place.

I have found that by varying the number of turns of the threads 25 and 26 around the rolls 5 and 7, many different fancy effects can be secured in the twisted yarn. For example, in Fig. 6 a second form is shown, wherein regular twists will be seen at 32, whereas longer and looser twists 34 will occur at intervals in the yarn. The yarns shown in Figs. 5 and 6 are examples of only two of the many different effects attainable by slight adjustments in the described structure. Among such adjustments is the positioning of the tension finger 21, the number of turns of the threads 25 and 26 around the two-diameter parts of the rolls 5 and 7, and the guiding and tensioning of the two threads prior to the extension of the same around the rolls.

Since the securement of the nubs or irregularities in the twisted yarn is primarily secured by variations in the feed of the wrapper thread relatively to the core thread and such variations occur haphazardly, it will be apparent that the spacings of the nubs or bunchings in the twisted yarn will, in most instances, vary. This will be found desirable rather than detrimental since it will avoid the appearance of regularity found undesirable in the woven fabric and which often results in the production of so-called "windows" in the fabric.

In the embodiments shown in Figs. 5 and 6, two threads, namely, a core thread and a wrapper thread, are shown in twisted relation. It will be understood that by a subsequent twisting operation, one or more locking threads may be applied, and which threads are usually wound in a direction opposite to that of the first wrapper thread, thus maintaining the nubs or irregularities against longitudinal shift along the yarn.

While I have herein described several types of twisted yarn which can be produced by the structure described, it will be apparent that various other types are readily obtainable by relatively simple adjustments in the elements of the apparatus as herein pointed out, as well as by variation in the number of turns taken around the rolls as well as by changes in the relative sizes of the two parts of the rolls. Therefore, no effort is made herein to disclose the many patterns which can be produced as the same may vary according to the effects sought.

Having described one embodiment of the invention, it is obvious that the same is not to be restricted thereto, but is broad enough to cover all structures coming within the scope of the annexed claims.

What I claim is:

1. A yarn-twisting device comprising, a pair of rolls rotated in the same direction and at the same speed, each of said rolls having parts of different diameters, the larger diameter portions of both rolls receiving a plurality of turns of a wrapping thread extending around both of said rolls without completely encircling either of them, the smaller diameter portions of both rolls receiving turns of a core thread about them without completely encircling either of them, and twisting means for twisting the threads together.

2. A yarn-twisting device as provided for in claim 1, and including variable tension means in the form of an adjustable tension finger operative between the core thread and the wrapping thread.

3. In a twisting device for the production of fancy twisted yarns, a pair of rolls rotated in the same direction, one of the rolls being situated above the other, each roll having a large diameter portion and a smaller diameter portion, the large diameter portion of both rolls receiving a plurality of turns of a wrapping thread extended about them, and the small diameter portions of the rolls receiving a plurality of turns of a core thread around them, the threads never completely encircling either of the two rolls.

4. In a twisting device as provided for in claim 3, including means for tensioning the wrapping thread to permit the building-up of irregularly-occurring intermittent slackness therein during feed to thereby result in intermittent nub formation in the twisted yarn.

5. In a twisting device for the production of fancy twisted yarns, a pair of rolls disposed one above the other, means for rotating said rolls in the same direction, each of the rolls having a large-diameter portion and a small diameter portion extending forwardly thereof, means for guiding a core thread which is looped with a predetermined number of turns about the large diameter portions of both rolls without completely encircling either of said rolls, and tension means for engagement with the lead-off ends of both threads.

6. In a twisting device for the production of fancy yarns, a pair of rolls situated one above the other, each roll having a large diameter portion, the large diameter portion of one roll being located above that of the other roll whereby a wrapping thread may be looped several times about the large diameter portions of both rolls without completely encircling either of said rolls, each roll having a smaller diameter portion projecting concentrically from its large diameter portion, the small diameter portions of both rolls being disposed one above the other to receive several turns of a core thread about them without completely encircling either of them, means for rotating both rolls at the same speed, tension means operative on the threads, and twisting means operative on the threads.

7. The method of producing fancy twisted yarns, consisting in turning core thread and wrapper thread about different-diameter portions of a plurality of rolls rotated in the same direction without the threads completely encircling any of the rolls, with tension arranged to secure slippage of and building-up of slack in the wrapper thread as it is delivered from the rolls and to thereby secure irregularity of wrap of said thread about the core thread to result in the formation of nubs in the twisted yarn.

8. The method of producing fancy twisted yarns, consisting in turning core thread and wrapper thread about a pair of superimposed rolls which are rotated in the same direction without causing complete encirclement of either of the rolls by said threads, disposing the threads about different diameter portions of the rolls and arranging for slippage of and intermittent building-up of slack in the wrapper thread about the rolls, to thereby secure irregularity of wind of the wrapper thread about the core thread.

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