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F. HONIG

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METHOD AND APPARATUS FOR TWISTING FILAMENTS

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Fig. 1.

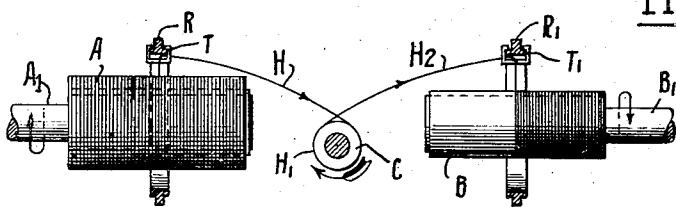


Fig. 2.

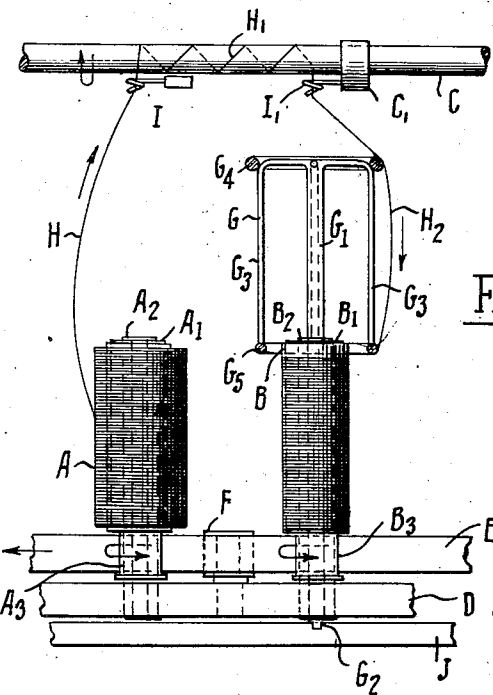


Fig. 3.

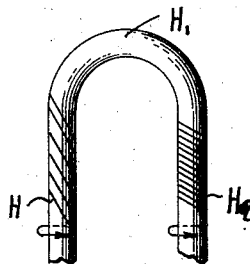


Fig. 4.

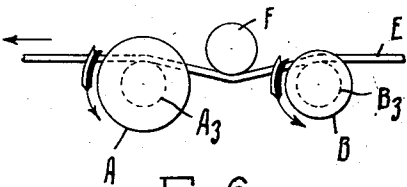
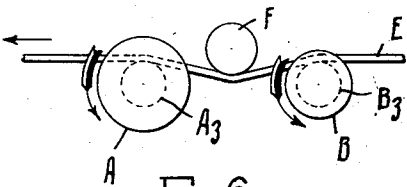


Fig. 5.

Fig. 6.



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METHOD AND APPARATUS FOR TWISTING
FILAMENTS

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Application February 28, 1934, Serial No. 713,252

4 Claims. (Cl. 117—24)

The invention relates to a method and apparatus for the manufacture of textile threads and in particular to the manufacture of such threads formed by twisting together a number of separate individual filaments. The invention is applicable to all kinds of filamentary material which are adapted to be twisted together into a single thread, but is particularly useful when applied to such materials as cotton, wool, silk, rayon and the like.

The object of this invention is to provide a simplified means and method for twisting individual fibers and/or filaments into the thread and at the same time produce an increased output of the finished product.

Heretofore it has been customary to unwind the filaments to be twisted from a source of supply which may be mounted on a spindle, thence to conduct them over a roller, referred to as the feeding roll, from which they are fed to the twisting and winding mechanism, thence through what is known in the art as a flyer or traveler, or ring-twister; that is, a small open loop-like element adapted to slide along the inner circumference of a closed ring, thence to the winding spool or core, mounted on a rotating spindle, the rotation of which imparts to the filaments one twist for each revolution of the spindle.

It has been proposed to eliminate the necessity of using the flyer or twister by combining the feeding roller with the winding roller, referred to in the art as the take-up roll or core; but this proposal has the disadvantage that while the diameter of the feeding roller decreases and the diameter of the take-up core increases due to the transfer of the thread from the former to the latter, the ratio of twists to core revolutions still remains constant; hence the finished product will not be of uniform texture, for the number of twists per linear unit of thread will be much greater at the end nearest the core than at the outer end.

In the practice of the present invention, not only is the use of the flyer or ring-twister rendered unnecessary, but a product can be produced which is of smooth and even texture, having the same number of twists per linear unit throughout its entire length, and in addition the number of twists per linear unit can be substantially doubled and the output of finished product increased in proportion.

An important feature of the present invention consists in imparting a twist to the filamentary materials just as or after they are unwound from the supply roll, and a second twist after they have left the feeding roll and just as they are about

to be rewound on the take-up roll. The operation of the mechanism can be so regulated that twists are imparted at the two points simultaneously, and if the winding and unwinding rolls rotate in the same direction, say, for example, counter-clockwise, and the feeding roll in the opposite direction, say clockwise, opposite directional twists will be imparted to the filaments; that is, at the time the portion of strand just coming off the supply roller is given a twist in one direction, the portion about to be wound on the take-up roller will be given a twist in the opposite direction. Thus is produced a thread having two twists for each revolution of the take-up spindle.

The mechanism for carrying out the invention will be best understood by reference to the accompanying drawing in which:

Fig. 1 represents a diagrammatic illustration of the improved method selected particularly to bring out the opposite directional twisting of the ends of the filament and shown with the employment of the ordinary ring traveler.

Fig. 2 is a diagrammatic end view of Fig. 1.

Fig. 3 is a view partly in section of the preferred embodiment of the invention showing both spindles rotating in the same direction, as indicated by the arrows, and a reciprocating, non-rotating distributing device.

Fig. 4 is a greatly enlarged portion of the filament as twisted by the preferred method shown in Fig. 3.

Fig. 5 is a view showing the manner in which the distributing device is prevented from rotating.

Fig. 6 is a view on the line 6—6 of Fig. 3.

In the drawing A represents the core of a package of filament constituting the supply and B represents a core on which the filament is wound up after being twisted. C represents a feeding roll or drum which receives the filament from the supply package on core A and delivers it to the take-up core B.

The package or supply core A and the take-up core B (Fig. 1) are suitably and demountably carried on shafts or spindles A1 and B1. In Fig. 3 the cores are shown as rotatably mounted on fixed hollow sleeves or spindles A2 and B2 whose lower ends are rigidly secured in standard D which is a part of the main frame of the machine (not shown). As shown in Fig. 3 the central openings of the spindles extend throughout their length and through the support D. The openings of all spindles are shown to be of approximately the same size.

The spindles A2 and B2 (Fig. 3) are driven by

suitable mechanism such as the pulleys A3 and B3 and belt E.

For purposes of this specification it may be considered that the spindles are rotating in the direction indicated by the arrows.

Belt E is provided with idler F (Figs. 3 and 6) to assist in maintaining suitable driving contact between the pulleys A3 and B3.

The delivery shaft or roll C is mounted in bearing C1 which is a part of the frame of the machine (not shown). Roll C is rotated by any suitable driving mechanism (not shown) to draw the filament from the supply package A and deliver it to the take-up core B at the rate of speed required to produce the desired number of twists in the filament.

The filament designated as H is drawn through a guide I from the supply package and is given one or more turns about delivery shaft C as indicated at H1 and then passes through guide I1 to the take-up spool B as shown at H2.

For the purpose of effecting even distribution of the finished thread over the take-up core, distributing device G is detachably mounted over the spindle B2 with an extension of the central shaft G1 running through the spindle B2. A slot G2 in the lower end of shaft G1 is adapted to fit into a horizontal bar J, which holds it against rotation with the spindle B, and the up-and-down movement of which permits the distributor to move up and down. The bar J extends below the open ends of all the spindles shown.

The thread coming from the feed roller is drawn over rings G4 and G5, supported by the vertical spokes G3, full and free movement of the thread being permitted as the spindle rotates.

In Fig. 1, R and R1 represent the ring, and T and T1 represent the traveler such as ordinarily used in connection with twisting operations. These parts act to distribute the filament on the respective core. However, as previously stated, the preferred embodiment is shown in Fig. 3 in which the filament is free to move about the outside of the distributing ring without the aid of a traveler.

It may be stated that the various moving parts of the mechanism are caused to move or rotate at the desired rate by any suitable driving means. This means is not shown since any well known means could be used for this purpose.

And, while, for convenience, only one supply package is shown in the drawing for each take-up core, it will be understood that any number of supply packages may be used in connection with one take-up spool. When more than one supply package is used for each take-up core and if all the filaments in the assembled thread require an equal number of twists, then all of the supply packages should be rotated alike. However, in cases where the finished thread requires that some of the individual filaments be twisted more

than others, the supply packages carrying the latter should not be rotated to produce the extra twist. In the methods previous to the invention this doubling operation was performed as a separate operation, but with my improved method the doubling operation or the assembling of separate filaments of various twists can be produced in one operation.

The invention may be variously modified and embodied within the scope of the subjoined claims.

I claim:—

1. Mechanism for twisting stranded material, comprising in combination, a plurality of core supporting spindles provided with tubular openings therein, one of said spindles serving to take up strand material received from another of said spindles, a strand distributing device provided with a projection fitting in the opening of said take-up spindle, means for rotating said spindles, means for feeding strand material to said take-up spindle, and means for holding said strand distributing device against rotation.

2. Mechanism for twisting stranded material, comprising in combination, a plurality of spindles and supports therefor provided with tubular openings therethrough, one of said spindles serving to take up strand material received from another of said spindles, a strand distributing device provided with a projection fitting in the opening of said take-up spindle, means for rotating said spindles, means for feeding strand material to said take-up spindle, and means for holding said strand distributing device against rotation.

3. Mechanism for twisting stranded material comprising in combination, a plurality of aligned spindles and supports therefor provided with tubular openings therethrough, one of said spindles serving to take up strand material received from another of said spindles, means for feeding strand material to said take-up spindle, a strand distributing device provided with a projection extending through the opening of one of said spindles, and means positioned below the openings of all of said spindles for cooperating with the lower end of said projection for holding the strand distributing device against rotation.

4. Mechanism for twisting stranded material comprising in combination, a plurality of aligned spindles and supports therefor provided with tubular openings therethrough, one of said spindles serving to take up strand material received from another of said spindles, means for feeding strand material to said take-up spindle, a strand distributing device provided with a projection extending through the opening of one of said spindles, and a bar positioned below the openings of all of said spindles for engaging the lower end of said projection to hold the strand distributing device against rotation.

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