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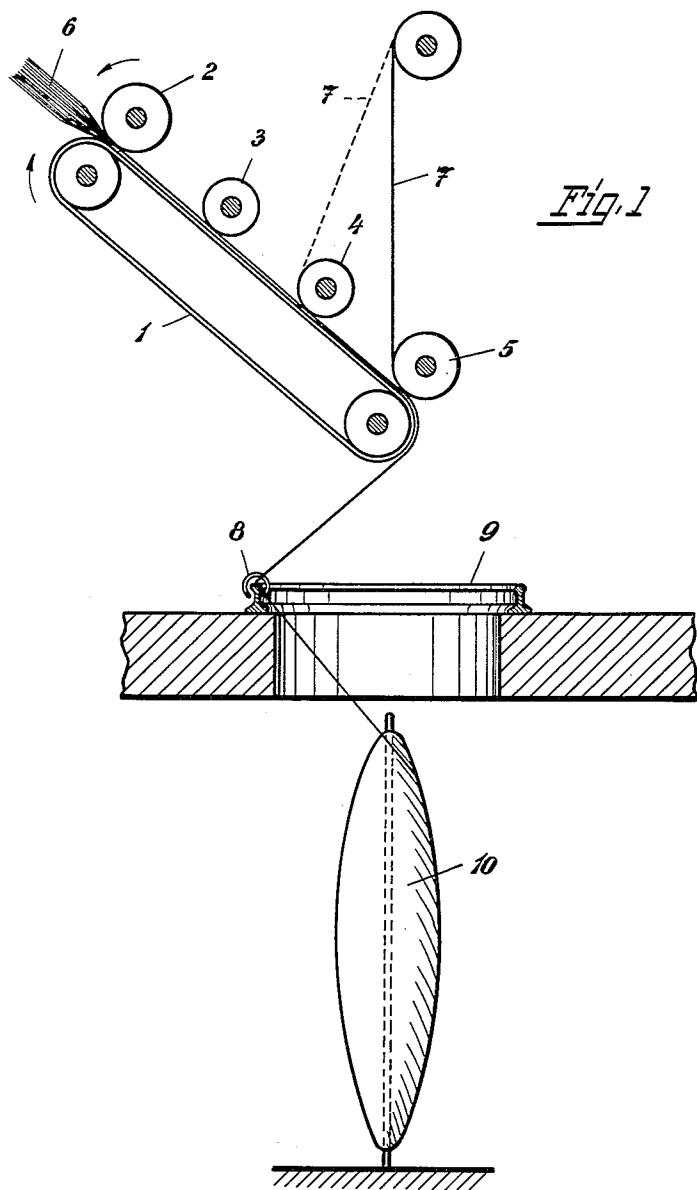
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2,746,236

PROCESS FOR THE MANUFACTURE OF THREADS

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2 Sheets-Sheet 1



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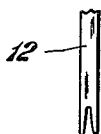
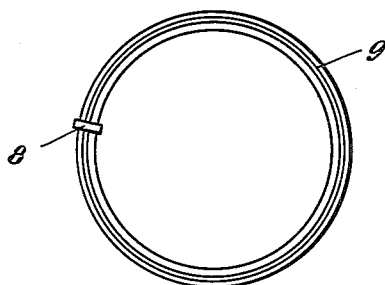
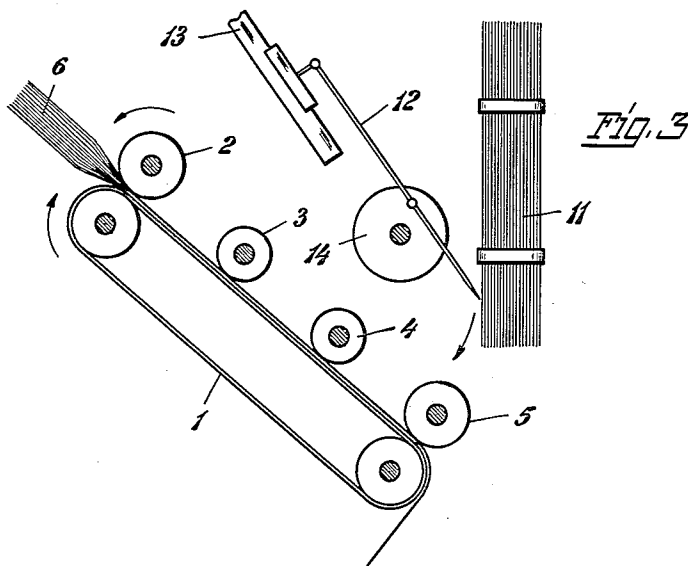
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PROCESS FOR THE MANUFACTURE OF THREADS

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1

2,746,236

PROCESS FOR THE MANUFACTURE OF THREADS

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2 Claims. (Cl. 57—160)

The present invention relates to a process for preparing spun threads containing fibers which are themselves not capable of being spun.

It is known to use threads containing stiff hairs and yarn for the purpose of manufacturing stiff fabrics or tissues. The method of producing such threads employed up to now consists essentially of using individual lengths of stiff hair, for instance horsehair and artificial horsehair which are wrapped around or sewed with a yarn. By such wrapping an endless or continuous thread is produced containing individual lengths of hair placed lengthwise in a row.

When this known method is used it is possible for the stiff hairs to project between the turns of the sewing or windings of the wrapped thread and in spite of the wrapping it happens that some stiff hairs pierce the wrapping and thin ends protrude from the thread. Besides, if artificial horsehair is used instead of real horsehair, the fabric woven from the thread tends to crumple to a high degree. The individual lengths of the stiff hairs used in this conventional thread are hardly corrugated or twisted, even if the wrapped thread of stiff hair has a certain twist per se.

It is also to be noted that this method of manufacture is relatively expensive.

It is one feature of the present invention that the thread produced by the method thereof is both reduced in cost and improved in quality and that at least one filament of the stiff hair not fit to be spun is incorporated along the entire thread, being inserted into the fibers to be spun during the drawing process. In this respect the method of the present invention is characterized by the fact that a constituent fiber which is not fit to be spun alone is used in the course of the spinning process.

Another feature of the invention resides in the fact that the method may be performed in such a way that successive lengths of stiff hairs, such as horsehair or artificial horsehair are incorporated into the fibers to be spun during the drawing.

According to a further feature of the invention an endless thread is produced, as described above, in which individual lengths of horsehair or similar stiff fibers are wrapped with yarn. In such a case it is not necessary to bring the successive lengths of the stiff hair into the thread so that their ends overlap. It is even possible to arrange them in the yarn with their ends spaced apart at certain distances from each other and held together only by the wrapping yarn into which the stiff fibers are spun.

Other features and advantages of the method of the invention will become apparent upon reading the following specification together with the accompanying drawing forming a part hereof.

Referring to the drawing:

Fig. 1 is a diagrammatic representation of a spinning machine showing the final drawing and twisting portions.

2

Fig. 2 is a plan view of a revolving ring used in the spinning machine.

Fig. 3 is a diagrammatic representation of a modified form of the final drawing portion of the spinning machine shown in Fig. 1.

Fig. 4 is a fragmentary view of a fiber gripper.

Referring to Fig. 1, there is shown an endless conveyor belt 1 which operates at constant speed. Spaced apart at suitable distances along belt 1, and in engagement therewith are drawing rolls 2, 3, 4 and 5. The peripheral speed of the drawing rolls increases progressively along the belt, the drawing rolls 2 having the minimum peripheral speed. The peripheral speed of roll 3 is greater than that of roll 2; the speed of roll 4 is greater than that of roll 3; and the speed of roll 5, the final drawing roll, is greater than that of the penultimate roll 4.

The roving strand 6 of fibers to be spun, i. e., drawn and then twisted, for instance cotton, is fed to the rolls 2 and is drawn and contracted between rolls 2 and 3. The roving 6 is again drawn and contracted between rolls 3 and 4, and finally drawn and contracted between rolls 4 and 5. The non-spinnable stiff fiber or hair is introduced into the roving 6 and 7 immediately before the roving is engaged by the final roll 5. The non-spinnable fiber 7 may also be introduced immediately before the roll 4 as indicated by the dotted line. The roving 6 including the non-spinnable fiber 7 pass together through the revolving guide member 8 which travels around the twisting ring 9 (Fig. 2), thereby producing the final spun product including the non-spinnable fiber 7 which is wound upon the spindle 10.

Referring to Fig. 3 it will be seen that the non-spinnable fiber may consist of individual lengths of fiber disposed in a magazine or bundle 11 and which are successively introduced into the roving 6 before it is twisted.

A gripper 12 has one end slidably connected to a guide member 13, the gripper 12 being pivotally connected intermediate its ends to the wheel 14. As wheel 14 revolves in a clockwise direction, the gripper 12 is pressed into engagement with the fibers of bundle 11 and moves downwardly, withdrawing one or more fibers from the bundle with its bifurcated end (Fig. 4) and moving the fiber thus withdrawn into engagement with the roving 6 immediately prior to engagement by roving 6 with the final drawing roll 5, which grasps the fiber and draws it forwardly.

By subsequent twisting process the ends of the hairs are twisted into the yarn and curled. As described above they are introduced into the fibers to be twisted preferably during the last stage of the drawing process.

As noted above, by means of the known hair catcher or gripper 12 as used in horsehair looms or horsehair covering machines, individual hairs are drawn from the hair bundle 11 and introduced into the drawing rollers of the spinning process in such a way that the stiff hairs run with the thread to be twisted and are twisted with it.

For the purpose of attaining the desired intimate incorporation of the spinnable fibers with the sections or lengths of the non-spinnable stiff hair, the said lengths are thus introduced during the last drawing process which is followed by the twisting.

Finally, a thread manufactured according to the known process described above, i. e., made of individual portions of stiff hair wrapped with yarn, may be incorporated into the fibers to be spun. However, care must be taken that drawing, which in this case does not take place even with a stiff hair, is avoided.

This thread is therefore incorporated into the yarn or the fiber bundle or roving 6 in contact with the last roller 5 of the drawing device. The individual portions of the

3

stiff hair may not only be incorporated during the final stage of the spinning process but also during the doubling or drawing. The practice has shown that the spinnable fibers may be drawn quite well when using smooth stiff hair, e. g., in the worsted-yarn spinning process.

Instead of the continuous or endless wrapped thread comprising lengths of stiff hair, a continuous filament or synthetic fiber may be introduced consisting for example of condensation products of adipic acid and which is incorporated into the yarn to be spun during or after the last drawing process. Here, the same effect happens as just described, namely, an increased resistance against crumpling of fabric woven from the thread is obtained by curling the filament of the synthetic fiber during the spinning, and piercing of the ends of the fibers thus wrapped by the spinning process is impossible. Besides, the twisting of the stiff hair around its own axis increases the elasticity of the thread. By the torsion and wrapping with natural fibers resistance against crumpling is obtained.

Having thus particularly described the nature of my said invention and the manner in which the same is to be performed what I wish to have covered by Letters Patent is:

1. In the process for spinning a thread of spinnable fibers, including the steps of drawing in a plurality of stages and twisting said spinnable fibers, the improvement which comprises successively introducing into said spinnable fibers in the last drawing stage immediately prior

4

to the twisting step predetermined limited lengths of at least one filament of a non-spinnable fiber.

2. In the process for spinning a thread of spinnable fibers, including the steps of drawing in a plurality of stages and twisting said spinnable fibers, the improvement which comprises introducing into said spinnable fibers in the last drawing stage immediately prior to the twisting step predetermined limited lengths of at least one filament of a non-spinnable fiber, said non-spinnable fiber being introduced in the form of a thread consisting of consecutively disposed lengths of non-spinnable fibers connected by a serving of yarn.

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