Jan. 6, 1931. A. E. GUENTHER ET AL 1,787,575

METHOD OF MANUFACTURE OF RAYON FILAMENTS

Original Filed May 27, 1926

Fig. 1.

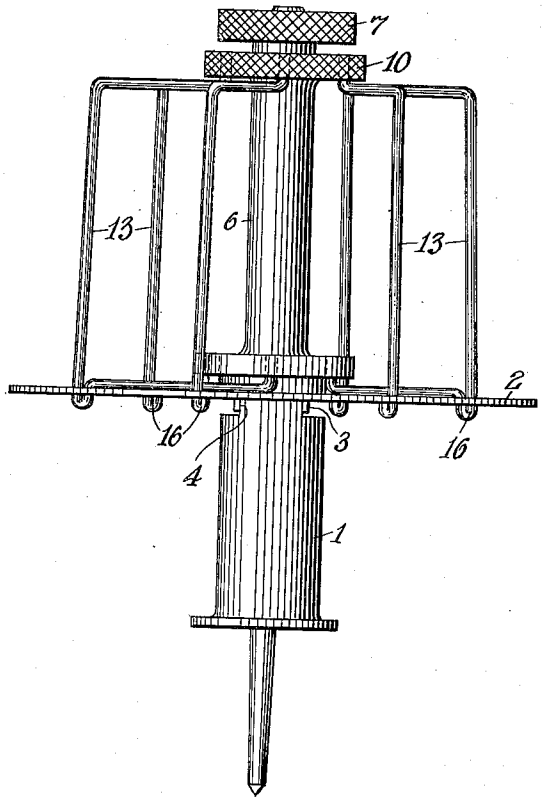


Fig. 3.

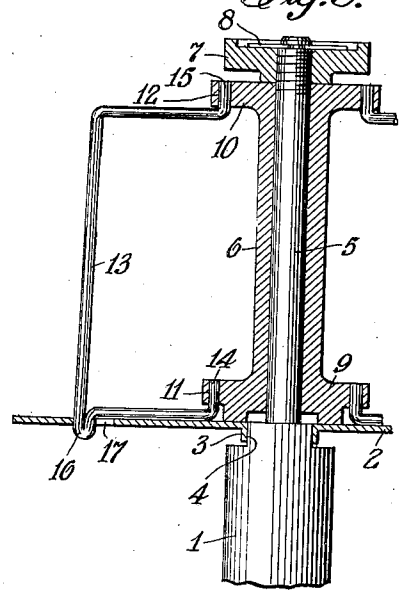


Fig. 2.

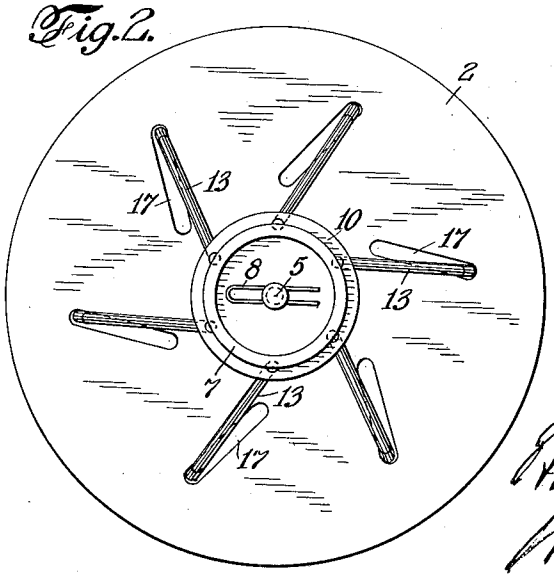
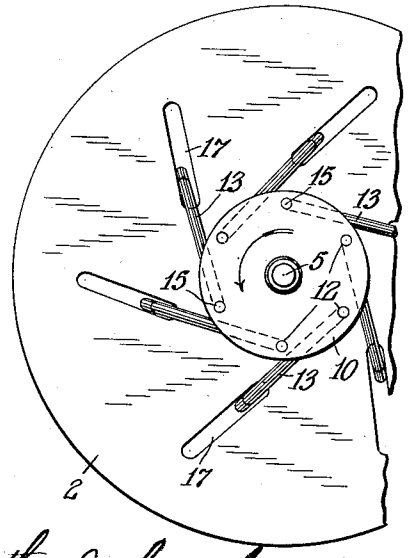


Fig. 4.



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UNITED STATES PATENT OFFICE

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METHOD OF MANUFACTURE OF RAYON FILAMENTS

Original application filed May 27, 1926, Serial No. 111,950. Divided and this application filed October 3, 1927. Serial No. 223,826.

This application is a division of our co-pending application Serial No. 111,950, filed May 27, 1926.

This invention relates to a novel and improved method of manufacturing rayon and more particularly to a method of imparting the required twist to rayon thread. In spinning rayon by the so-called bucket process the rayon, while still wet from the coagulation bath, is wound into a rotating bucket where it forms a cake, this winding giving a certain amount of twist to the thread. In actual practice this twist amounts to about three turns per inch of length, and that is about the maximum which can be achieved. Theoretically, an additional twist could be imparted to the thread by increasing the speed of rotation of the bucket, but actually it is not possible to thus increase the speed of the machine sufficiently to give the desired result.

We impart an additional twist to the rayon by removing the cake from the bucket and subsequently placing it bodily upon a bobbin on a throwing machine which is then operated in the manner common to such machines. This method is made possible by the use of a special bobbin of such a construction that it may be inserted within the cake of rayon and the cake secured thereon. It is desirable to avoid handling of the rayon as much as possible, because each handling means a substantial waste of material in addition to the cost involved in the expenditure of time. Therefore, we have devised the above method for throwing the rayon directly from the cake rather than rewinding it and then throwing it.

It is a further object of our invention to provide a bobbin of novel and improved form which may be used to receive a cake of rayon in the form in which it comes from a bucket and support the cake upon a standard throwing machine, thus avoiding the necessity of winding the rayon from the cake onto the bobbin before throwing.

In the accompanying drawing we have shown a selected form of the bobbin which we employ in the practice of our method and referring thereto:

Figure 1 is an elevation of a bobbin constructed according to our invention.

Figure 2 is a plan view of the structure shown in Figure 1.

Figure 3 is a fragmentary vertical section through the structure appearing in Figure 1.

Figure 4 is a fragmentary plan view corresponding to Figure 2 but showing the parts in different relation.

The bobbin illustrated in the drawing comprises a spindle 1 the lower part of which is of standard or ordinary construction adapted to be used on throwing machines of well-known commercial types. This spindle supports at substantially right angles thereto a plate 2 having one or more tongues 3 bent downwardly from the central aperture therein and registering with flat portions 4 on the spindle to key the plate to the spindle. Fitted over the stem 5 of the spindle is a spool 6 secured in position on the stem by a lock nut 7 which is threaded upon the upper end of the stem. A suitable retaining device 8 may be employed to prevent accidental removal of the lock nut.

The spool 6 is provided with a pair of substantially parallel flanges 9 and 10 which are provided with vertically aligned apertures 11 and 12 to receive the ends of the vanes 13. These vanes are preferably in the form of wires bent to the form shown and having their ends 14 and 15 received in the apertures 11 and 12 respectively. This arrangement exemplifies means for pivotally mounting the vanes upon the spool, the vanes being held in position by the plate 2.

The vanes are adapted to expand outwardly from the axis of the bobbin and to be moved to and from the axis to vary the diameter of the hub which is formed by the vanes. Each vane is provided with a lug 16 which may be conveniently formed by a loop in the wire forming the vane and each lug extends into a slot 17 in the plate 2. These slots form cam means for guiding the vanes and for causing them to move toward or from the axis of the bobbin upon rotation of the spool. These slots may be arranged at any suitable angle but we prefer to make

them substantially tangent to the circle formed by the apertures 11.

The plate 2 not only holds the vanes 13 in expanded position and holds them firmly against distortion, but also forms a support for the rayon cake and tends to keep the lower layer of filaments in their original order thereby preventing breakage and waste.

In operation the cake of rayon in the form in which it comes from the spinning bucket and in either a wet or dry state is placed upon a bobbin constructed according to our invention as described above. The hub of the bobbin is collapsed by turning the spool in the direction of the arrow in Figure 4, wherein the collapsed position is shown. By turning the spool in an opposite direction to that shown by the arrow, the hub of the bobbin is expanded, the maximum expansion being illustrated in Figures 1, 2 and 3. The upper flange 10 is knurled to form ready means for the turning operations referred to. When the hub is expanded to a position where it will securely hold the cake, the lock nut 7 is tightened against the flange 10, this nut being knurled for this purpose. The vanes are then held in proper position to form the desired diameter of the hub.

After the cake of rayon is mounted upon a bobbin, the bobbin is placed upon a standard throwing machine and the thread therefrom is led to another bobbin or spool on the machine. When the machine is put in operation, the thread is unwound onto the last-named bobbin thus imparting the additional twist. Throwing machines of this type are well-known in the textile art, and we have not deemed it necessary to illustrate or to describe them further.

The above method forms a manner of imimparting additional twist to rayon thread without the necessity of unwinding and winding with its attendant waste. The twist imparted to the rayon in the spinning bucket is done while the rayon is wet and therefore the amount of twist which can be given to the thread without materially decreasing production is limited. However, it may be given the additional twist by the method described above and it will be seen that this is done in a manner which is extremely simple and efficient.

The method used in our invention is made possible by the use of the bobbin formed with an expansion hub. It will be obvious that this bobbin is of a form which may be very cheaply and efficiently made and assembled and in which the number of parts is reduced to a minimum. The necessary adjustments are readily effected by a simple turn of the spool and then the parts are locked in the desired position by an equally simple turn of the lock nut.

We are aware that various changes in details may be made in the practice of our invention without departing from the scope thereof, and we therefore do not intend to limit ourselves except by the appended claims.

We claim:

1. In the manufacture of rayon the method which comprises collecting the rayon in a bucket to form a cake, thereby imparting a twist thereto, placing the cake on an expansible bobbin and then throwing the rayon to impart an additional twist thereto.

2. In the manufacture of rayon the method which comprises collecting the rayon while wet in a bucket to form a cake, thereby imparting a twist thereto, placing the cake on an expansible bobbin when dry and then throwing the rayon to impart an additional twist thereto.

In testimony whereof, we have affixed our signatures to this specification.

ARTHUR E. GUENTHER.
HARRY S. TOOLE.