Dec. 25, 1934. R. ELSSNER 1,985,603

PROCESS OF WINDING THREADS AND THE LIKE

Filed April 1, 1932

Fig. 1.

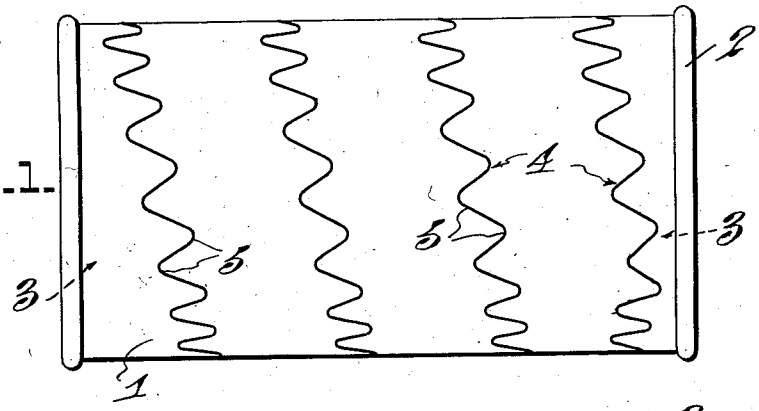


Fig. 2.

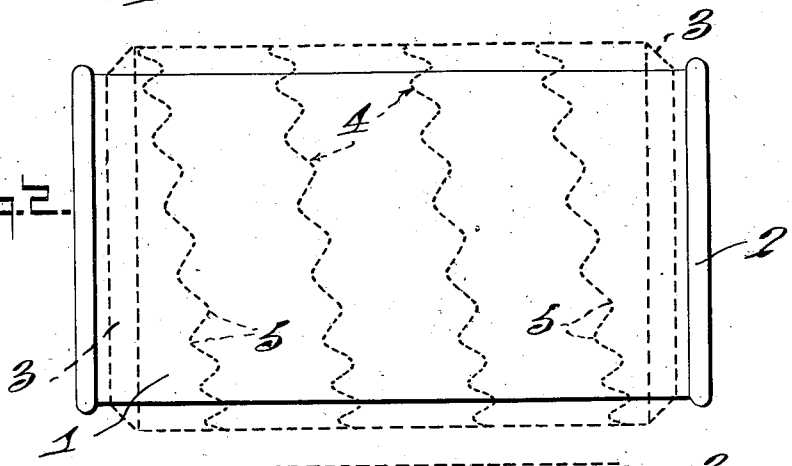
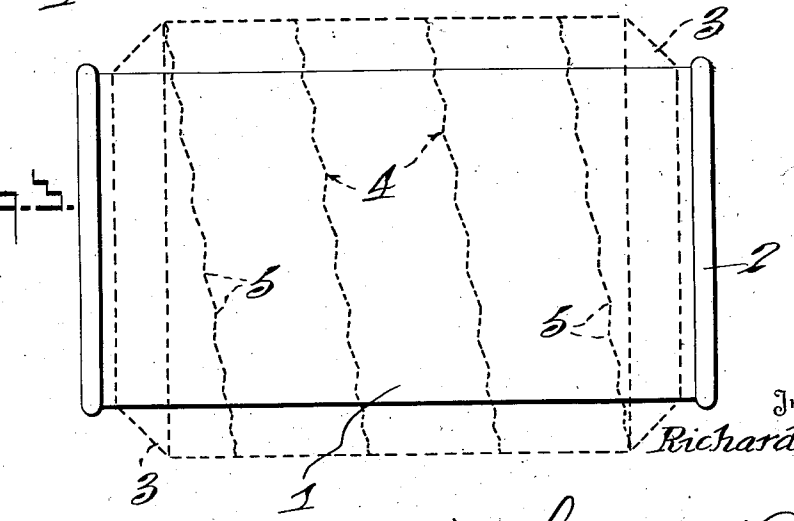


Fig. 3.



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PROCESS OF WINDING THREADS AND THE LIKE

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Application April 1, 1932, Serial No. 602,635

4 Claims. (Cl. 242—159)

My present invention relates to a method of producing artificial threads and the like, and has for its primary object the production of a more suitable yarn body than has been heretofore possible.

In the production of artificial silk and the like, according to the well known viscose process, the thread issues from a spinnerette immersed in a suitable coagulating bath, and the thus newly-formed thread-like material passes directly to a winding mechanism consisting essentially of a thread-guide and a rotatable foraminous or perforated spool, said elements having a transverse movement one with relation to the other so that the thread-like material is wound cross-wise into a number of superimposed series of convolutions first in one then in the other direction.

One difficulty which had been encountered in the production of artificial silk and the like was a tendency toward a lack of uniformity in the character of the thread which tendency was caused by the fact that the material during the various processes is subjected to unequal strains. For example in washing and dyeing of the freshly formed thread by drawing liquids through the convolutions of the material into the interior of the spool unequal strains are set up, and, since the thread is already more or less tightly wound on the spools, the ready and equal penetration of the liquids through the yarn body is prevented. To overcome these difficulties there has been provided a method of winding the thread on spools which consists essentially in laying or winding the thread-like material into slack convolutions of such amplitude that subsequent shrinkage may occur without placing unequal strain on different portions thereof. This is accomplished by the provision of a suitable means which imparts to the reciprocating thread guide an oscillatory movement. This results not only in a helical winding of the thread on the spool but at the same time undulations are produced in each helix.

I have found, however, that although such a winding has produced satisfactory results in the washing and drying of the yarn, yet it must usually be given a twist by placing the spool on a suitable twisting machine. I have found that due to the helical path in which the yarn has been placed on the spools by the above process, the outer convolutions thereof become very loose when the thread is being twisted. This is due to the peripheral speed of the spun spool and the centrifugal forces generated thereby.

It is therefore an object of my present invention to provide a novel method which will overcome the difficulty mentioned above.

A further object of my present invention is to provide a suitable method in which the undulations formed on the helically wound thread will be gradually reduced in amplitude thus reducing the looseness of wind as the yarn body is formed.

These and other objects will in part become obvious and in part be pointed out in the following specification and in conjunction with the accompanying drawing, in which:

Figure 1 is a diagrammatic view of a typical lay or winding of the thread-like material on a spool at the beginning of a wind;

Figure 2 is a view similar to Figure 1 illustrating in dotted lines the wind after it has partially built upon the spool, the lay or winding of the thread-like material at this point has had the amplitude of the oscillation suitably decreased;

Figure 3 is a view similar to Figures 1 and 2 illustrating in dotted lines the yarn body after it has been almost completely built up on the spool, one lay or winding of the thread-like material being shown with the amplitude of the oscillations reduced to a negligible amount.

In the drawing in which like numerals of reference indicate like parts, 1 indicates the cylindrical winding surface of a spool, which may be used in the collecting of threads of artificial origin. The yarn body is indicated in dotted lines by the reference numeral 3. The thread, or threads, 4, or the like, is laid in a series of undulations 5 crosswise, first in one direction and then in the other direction, said series being superimposed.

In Figure 1 it will be noted that the amplitude of the undulation 5 is about twice that of the amplitude of undulations 5 indicated in Figure 2 of the drawing. In Figure 3 the convolutions 5 are shown to have a negligible amplitude.

Thus it is readily perceived how the amplitude of convolutions of the thread or filaments 4 may be gradually reduced as the yarn body builds up on the spool.

My invention consists in leading the freshly spun thread to a spool which is adapted to be rotated by any suitable mechanism. The thread is laid on the spool by a reciprocating guide and the guide itself is oscillated through a predetermined arc. As the winding of the thread continues, I gradually decrease the arc through which the thread guide is oscillated so that when the winding is completed, the oscillation of the thread guide will be decreased a certain degree. Thus the layers of threads adjacent the spool will be

loosely wound in helical undulations of large amplitude permitting the shrinkage of the yarn against the spool without imparting any undue and unequal strains thereto. Since the outer layers, when shrunk, will bear against the yielding yarn body, the same amplitude of undulation will be unnecessary. Moreover the outer layers being more tightly wound, permit the yarn to be more easily unwound when placed in position for the twisting step without impairing in any manner the twisting operation.

I may also discontinue the oscillatory movement of the thread guide during the last few moments of the spinning or winding operation. The results obtained thereby will be even more favorable from a twisting standpoint, as the layers of thread spun in the manner just described will act as a convenient starter when the spools are placed in operative position on the twisting machine.

Although I have described my invention with specific relation to the production of artificial silk and the like by the viscose process, it will be readily appreciated that my new method of spinning may be used with other processes and I therefore desire it to be understood that I am not limited except by the scope of the appended claims.

What I desire to claim as new is:

1. In a method for winding yarn upon spool, the steps of winding the yarn thereupon in a series of superimposed layers extending in opposing helical directions, undulating the filaments in each layer so that a series of undulations in the plane of each helix is produced, and gradually decreasing the amplitude of the undulations as the thread body upon the spool increases in size.

2. In a method for winding yarn upon spools, the steps of winding the yarn thereupon in a series of superimposed layers extending in opposing helical directions, undulating the filaments in each layer so that a series of undulations in the plane of each helix is produced, decreasing the amplitude of the undulations as the thread body upon the spool increases in size, and winding the outermost layers without any undulations whatever.

3. In a method of winding yarn bodies, the steps of laying up the yarn body in a series of helical windings in superimposed layers, undulating the filaments of separate layers and decreasing the amplitude of the said undulations while the build-up of the yarn body proceeds.

4. In a method for winding yarn upon spools, the steps of winding the yarn thereupon in a series of superimposed layers extending in opposing helical directions, undulating the filaments in each layer so that a series of undulations in the plane of each helix is produced, and decreasing the amplitude of the undulations as the thread body upon the spool increases in size.

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