

April 17, 1934.

T. MALKOMES

1,955,719

FILAMENT WINDING AND TREATING

Filed March 19, 1932

Fig. 1.

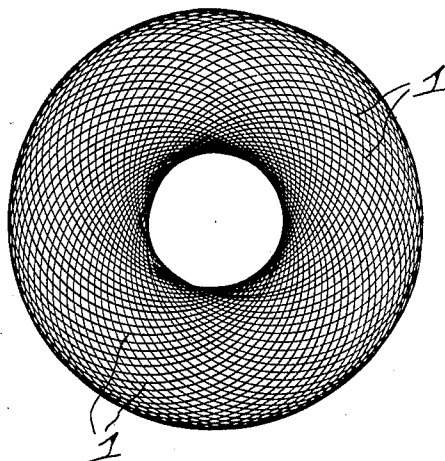


Fig. 2.

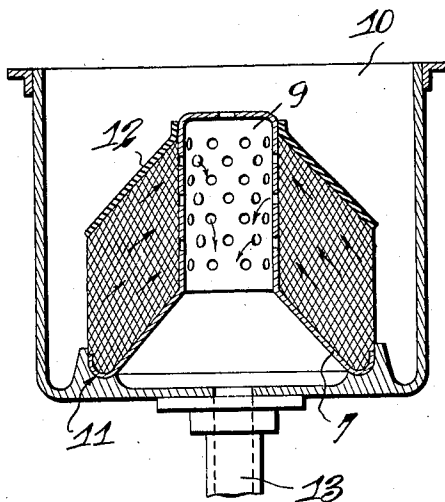
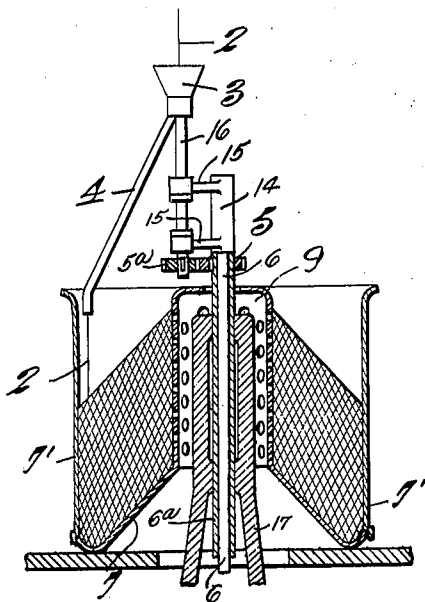


Fig. 3.

Inventor
Theodore Malkomes.

By *Thomas H. Byron*
Attorney

UNITED STATES PATENT OFFICE

1,955,719

FILAMENT WINDING AND TREATING

Theodore Malkomes, Doncaster, England, assignor to American Bemberg Corporation, New York, N. Y., a corporation of Delaware

Application March 19, 1932, Serial No. 599,984
In Germany March 21, 1931

14 Claims. (Cl. 49-54)

My invention has to do with a new method of and apparatus for the winding and subsequent treatment of filaments, especially artificial silk filaments.

Methods are known whereby the thread is accumulated in narrow spirals to form a ring shaped package. However, the filaments in such a package are wound so loosely that the same becomes very difficult to handle. Moreover, the filaments are likely to become damaged during the unwinding process, as the spirals tend to become tangled and knotted.

One object of my present invention is to wind the filaments in such a way that they may not become entangled in subsequent treatments.

Another object of my invention is to so wind the filaments that the same do not become damaged because of shrinkage.

A still further object is to provide an apparatus wherein the package of yarn so formed may be treated.

These and other objects will become more apparent from a study of the following specification, and of the attached drawing in which:

Figure 1 is a plan view of the base of the package;

Figure 2 is a cross sectional view of the spinning arrangement for the manufacture of the package to be wound according to Figure 1; and

Figure 3 is a cross sectional view of the package inserted in the treating tank.

Referring now to the drawing, I have shown in Figure 1, the manner in which the filaments are wound into a package according to my present invention. It should be noted that the diameter of the loops of the filaments or threads (1) is larger than the radius of the packages. By such winding the shrinkage which results from subsequent after treatments is taken care of and the filaments or threads in the interior of the yarn body are flexibly wound although there remains considerable coherence of the filaments in a radial direction. Such result is obtained by winding the thread in the loop form as shown. In prior practice the strong tension created in the yarn body by the shrinkage of the thread during the after treatments created a considerable tightening of the inner layers of the yarn body. This disadvantage has been overcome by my present winding. To maintain the shape of the package, it may sometimes be advisable to insert in the core of the package, a suitable shaping means such as a cylindrical member or peg which will fit snugly within said core. The yarn body is built up axially by means of a cone

shaped base upon which the thread is placed in a plurality of layers.

In Figure 2, I have shown a sectional view of the spinning arrangement in which the threads or filaments are formed into a package in the manner set forth above. The freshly spun thread or filament (2) is led vertically downward into the funnel shaped upper mouth (3) of the guide pipe (4). Treating liquid is also introduced into the funnel portion of the guide and assists in moving the thread downwardly through the guide to the container.

The thread guide funnel 3 is supported by the shaft 6 through the medium of a bracket 14 which is secured to the shaft 6 and rotates with it. The bracket 14 has arms 15 bored to receive the shaft 16 of the funnel 3. Through the rotation of the shaft 6 the gear 5a rolls around the gear 5 in a planetary motion thereby causing the stem 4 of the funnel 3 to carry out a cycloidal motion.

The shaft 6 extends through a hollow shaft 6a which is supported by a bearing 17 thereby supporting the planetary gear arrangement along with the funnel 3.

In the arrangement shown the hollow shaft 6a and gear 5 are stationary and it will be readily apparent how the cycloid movement takes place.

It will also be obvious that it would be possible to rotate the hollow shaft 6a in the opposite direction to the shaft 6 and thereby gain a closer winding of the threads.

When it is necessary to lift the yarn package for wet-treatment according to Figure 3 this can readily be done by lifting the funnel and gears as a unit any suitable release coupling for the shafts 6 and 6a being used. It is advisable to move the upper end of the guide pipe in a small path so that the thread will be maintained in the same direction at all times. The thread (2) emerging from the lower end of the guide pipe is thus placed in a plurality of loops (see Figure 1) into a collecting container (7). The container (7) is annularly formed and the bottom surface thereof is cone shaped merging into a hollow perforated core (9). The casing (7') constituting the side walls of the container is removably secured to the conical bottom. Because of the conical shape of the bottom portion of the container the thread will be placed in cone shaped layers thus obtaining a yarn body which is more securely packed in the axial direction thereof so that the thread can be unwound more easily without knotting or entangling the thread.

The package thus formed does not require a special support.

Because of the peculiar formation of the wound package the necessary and usual treatments may be performed to greater advantage. To avoid entanglement of the thread layers, the wound package is left in the container (7), the removable casing portion (7') thereof is removed, and the conical portion and core with the yarn body is then placed in the treating container (10). As will be noted this treating container is provided on its bottom with a flanged portion or ring (11) so shaped as to receive the curved bottom portion of the container (7). To hold the top layers of the yarn body in position, I have provided a ring shaped rubber disc (12) which fits snugly against the top conical edge of the yarn package. A plug (16) is then inserted in the aperture (15) in order that the treating liquids may be drawn through the walls of the yarn body. Any desired means of washing or treating the yarn body may be used. I have shown in this instance the use of a suitable vacuum system to suck the treating liquid contained in the tank from the outside to the inside of the yarn body and thence through the perforations formed in the core. As is designated by the arrows the liquids will be sucked through the yarn body at an angle to the horizontal. The liquids will necessarily take this path in their passage through the yarn body due both to the shape of the conical portion of the container and the rubber disc, and also because of the fact that the layers of thread of the yarn body have been wound in a conical manner. It is to be understood, however, that other methods of treatment may be used. For example, the liquid may be forced through the pipe (12), instead of being sucked there-through as described above, through the perforations in the core, and thence from the inside to the outside of the yarn body.

From the above description it will be appreciated that I have provided a new method of winding artificial silk and a new arrangement for accomplishing the method. By forming a yarn body having the layers arranged as indicated in Figure 1, I have avoided the knotting and entangling of the thread during the washing and/or treating steps. Moreover the finished yarn package may be unwound more easily and at the same time the layers will not become entangled while in the package form.

Although I have described one preferred form of my invention, it is obvious that many changes may be made in the mechanical construction of the spinning device without departing from the spirit or scope of the invention. I wish it, therefore, to be understood that my invention is not to be limited except by the scope of the appended claims.

Having now described my invention, what I desire to claim is:

1. In the process of spinning artificial thread the step of laying the thread in loops, each loop having a constant diameter greater than the radius of the product to be wound.

2. In the process of forming a conical yarn package of artificial thread, the steps of laying the thread on a conical base and in laying the thread thereon in a plurality of loops, each loop having a constant diameter greater than the radius of the yarn package. 8C

3. A process for the manufacture of artificial thread comprising laying the thread on a conical member to form a yarn body in a plurality of loops, each loop having a constant diameter greater than the radius of said yarn body, placing said yarn body in a treating container, and passing treating liquid through said yarn body from the outside to the inside thereof. 85

4. A process for the manufacture of artificial thread comprising laying the thread on a conical member to form a yarn body in a plurality of loops, each loop having a constant diameter greater than the radius of said yarn body, placing said yarn body in a treating container, and passing treating liquid through said yarn body from the outside to the inside thereof at an angle to the vertical axis of said yarn body. 90

5. In the wet treatment of filaments, the step of passing treating liquid through a wound body of filaments at an angle oblique to the horizontal. 100

6. In a process of the class set forth, the step of winding a thread body so that each loop has approximately the same diameter. 105

7. In a process of spinning artificial filaments, the step of laying the thread in loops of approximately the same size.

8. In a process of spinning artificial filaments, the step of laying the thread in loops of approximately the same size, each loop having a diameter greater than the radius of the finished cake. 110

9. In a device of the class described, an annularly shaped receptacle having a conical base and a perforated core, guide means to lay thread in said container in a yarn body, driving means to move the upper end of said thread guide in a circular path and the lower end of said thread in a cycloid on a circular path around the center of said driving means, whereby the thread is laid in a plurality of loops, each loop having a diameter greater than the radius of said yarn body. 115

10. A wound body of looped filaments, the upper and lower faces of which are at an angle to the perpendicular. 125

11. A wound body of filaments, the upper and lower faces of which are at an angle to the perpendicular, the upper and lower faces, however, being parallel one to the other.

12. A thread body so wound that shrinkage of the filaments, due to the after-treatment of the filaments will not place undue strain on the inner layers. 130

13. A wound thread body, each loop of which has approximately the same diameter as every other loop. 135

14. A wound thread body, each loop of which has approximately the same diameter as every other loop, and each loop having a diameter greater than the radius of the final cake. 140

THEODORE MALKOMES.