Sept. 14, 1937. W. SCHIEBER 2,093,140

MANUFACTURE OF ARTIFICIAL SILK

Filed Feb. 24, 1933

Fig. 1

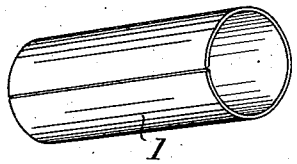


Fig. 2

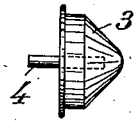


Fig. 3

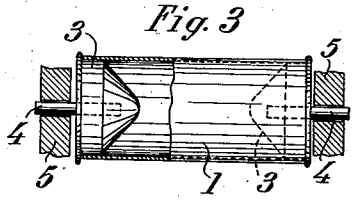


Fig. 4

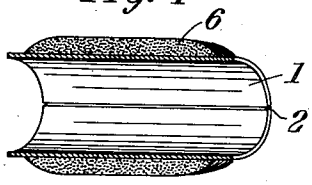


Fig. 5

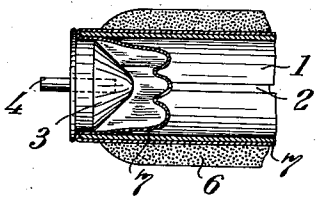


Fig. 6

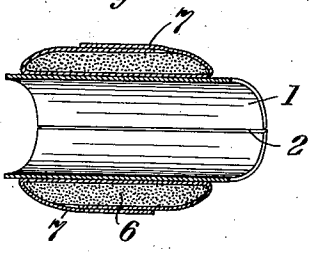
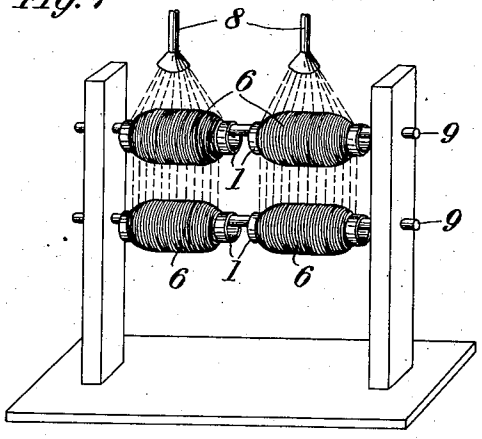


Fig. 7



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MANUFACTURE OF ARTIFICIAL SILK

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6 Claims. (Cl. 18—54)

My present invention relates to the art of manufacturing artificial silk and more particularly to the after-treatment of artificial silk.

I have found that the after-treatment of artificial silk proceeds very quickly by subjecting the twisted thread in the loose condition to the action of the after-treating liquids which condition can be obtained by the use of twisting bobbins the diameter of which can be varied. A short irrigation will suffice to after-treat such a loose lap of twisted threads.

This process saves much manipulation and eliminates machines hitherto necessary for finishing the artificial silk, as compared with the methods hitherto usual when producing artificial silk according to the bobbin spinning system. Furthermore the quality of the silk produced when this invention is applied is greatly improved over that of the artificial silk hitherto available on the market and after-treated in hank form or on the spinning bobbin. Particularly the running off in the winding operation is superior to that of artificial silk produced according to the methods hitherto in use with the bobbin spinning system, and the number of broken capillary threads is very low. By shortening of the after-treating period the quantity of after-treating liquid is reduced whereby costs are saved and the advantage is obtained that the quantity of the impurities always present in the after-treating liquids, which is deposited on the outer layers of the lap of fibers is diminished.

In this new method of working good results are obtained within a short time by sprinkling or irrigating the laps with the liquids. It is possible to finish the after-treatment in nearly the same time as it is possible in the usual treatment of silk in hank form.

For carrying out the process there may be used any bobbin the circumference of which can be varied and which is suitable for use in the twisting operation, however, there is preferably used a simple bobbin, as usual in twisting artificial silk, made of an elastic material which has been slit in the direction of its longitudinal axis. The dry thread after having been twisted, runs on the bobbin the circumference of which has been somewhat increased in a simple manner by introducing into the bobbin a core having a somewhat greater diameter than the internal diameter of the bobbin. Preferably there is used a core consisting of two parts which are not connected with each other, one of said parts being introduced into each of the two openings of the bobbin, thus causing the slit to be widened and a small increase of the circumference of the bobbin. The increase of the circumference of the twisting bobbin may generally be 1 to 3 per cent., however, the best amount can be easily determined by experiment. In the center of each part of the core, which can be made from wood, an artificial material or metal, there is provided a projecting pin, adapted to rotate in a slot of the twisting machine, thus guiding the bobbin on which the twisted thread runs, the bobbin being driven by a rotating shaft against which the bobbin presses by its own weight. That part of the core which extends into the interior of the bobbin may be conical to facilitate introduction into the bobbin. It is, of course, essential that the bobbin should have elasticity so that after the core has been removed the diameter of the bobbin is somewhat lessened. A suitable material for the bobbin is aluminium or another metal preferably coated with a lacquer, but there can also be used a bobbin of artificial masses reinforced by rings of cloth or metal. It is not necessary to use bobbins of the usual size; it may often be advantageous to use twisting bobbins which have a diameter considerably larger than that which is usual. When using twisting bobbins of a diameter larger than that of the spinning bobbins it is possible to wind on the twisting bobbin the content of two or more spinning bobbins.

The after-treatment and drying may be effected with the lap still on the bobbin with the reduced circumference, or after the lap has been removed from the bobbin. In many cases it may be advantageous to cover the bobbin with a baggy covering which may be permeable, partly permeable and partly impermeable, or impermeable, for instance, a covering of textile, felt, rubber, or the like, before winding the thread on the bobbin, in order to prevent the lap from being damaged. If desired this covering may be longer than the bobbin so that its ends can be drawn over the lap, in order to cover the latter in the after-treatment and drying. The permeable covering acts hereby as a filter preventing the lap from being soiled by impurities contained in the after-treating liquid.

If the twisted thread is wound on a bobbin which has been covered by a covering of the kind above mentioned, the lap can easily be removed from the bobbin, wrapped in the covering, and irrigated or sprinkled with the after-treating liquids in this condition.

The after-treated and dried lap may be sold

in the covering to the user who may use it without a rewinding operation by putting it on a bobbin or on a reel. The after-treated lap may also be wound on a special bobbin for use in the textile industry, for instance, on cops or cross wound bobbins.

The following examples illustrate the invention and show the simplification involved in the new method.

Example 1.—The freshly precipitated artificial silk threads are wound as usual on perforated spinning bobbins, freed from acid by washing with water under suction or pressure and dried. The dried thread is twisted on a twisting machine with several rows of bobbins one above the other, and the twisted thread runs on a slitted twisting bobbin, having its circumference somewhat increased by the insertion at each end of a core of suitable size. After the twisting operation is finished the cores are removed from the bobbin and the lap thus loosened is subjected successively to the action of the after-treating liquids in a device as usual for the after-treatment of artificial silk in hank form by irrigation or sprinkling. The finished, dried lap is brought into the form of a cross wound bobbin or any other suitable form.

Example 2.—The freshly spun artificial silk is wound on a bobbin, washed thereon, dried, and twisted as described in Example 1. In the twisting operation there is used a bobbin, the circumference of which has been somewhat increased, as in Example 1, but before running the thread on the bobbin, the latter is covered with an elastic baggy covering of tricot-cloth which extends over the ends of the bobbin. The extended ends of this covering are turned into the bobbin and fixed by the two cores inserted in the bobbin. After the twisting operation is finished, the cores are removed whereby the diameter of the bobbin is somewhat lessened. The loosened lap may be after-treated on the bobbin, the ends of the baggy covering being drawn over the lap; or the lap is removed from the bobbin together with the covering, is wrapped in the latter subjected to the after-treating liquids by irrigation or sprinkling and dried. The silk may be marketed in this form.

As twisting bobbin in the present process there can be used, for instance, the usual unperforated twisting aluminium bobbin slit in the direction of its longitudinal axis and preferably coated with a lacquer. The diameter of the twisting bobbins may be the normal 5–10 cm. or it may be 10–20 cm. or even greater, depending upon the length of thread to be wound thereon and of the space available of the twisting machine.

The accompanying drawing illustrates in detail several of the embodiments of the present invention.

Fig. 1 shows a twisting bobbin.

Fig. 2 is a side view of a core.

Fig. 3 is a part-sectional view of a bobbin mounted upon two cores.

Fig. 4 is a sectional view of a bobbin showing thereon, a lap of artificial silk threads ready for after-treatment.

Fig. 5 is a sectional view showing a core inserted into the end of a bobbin and the bobbin covering material underneath the lap.

Fig. 6 is a view similar to that of Fig. 4, showing the ends of the bobbin covering material drawn over the lap.

Fig. 7 shows an arrangement for after-treating the loosened lap.

Twisting bobbin **1**, longitudinally slit at **2**, may consist of aluminum or some other suitable elastic material. Two conically shaped cores **3** are inserted, one at each end, into bobbin **1**, to increase the diameter of said bobbin, and to provide therefor two pins **4**, adapted to rotate in the slots of the twisting machine frame **5**.

Referring to Fig. 5, the bobbin **1** is covered with a baggy covering of tricot-cloth **7**, the ends of said cloth **7** having been turned into the interior of the bobbin and fixed therein by the cores. The lap **6** is then wound on the cloth **7**. After the winding operation the cores **3** are withdrawn from the bobbin and the ends of cloth **7** are drawn over the lap **6** so as to cover the latter. For after-treating the loosened lap **6**, several such bobbins **1** are threaded on sticks **9** and sprinkled with after-treating liquids issuing from nozzles **8**.

The invention is not limited to embodiments shown in the drawing nor to the examples. Other modifications which are obvious equivalents of those shown or described are regarded as included within the appended claims.

What I claim is:

1. In the manufacture of artificial silk according to the bobbin spinning system the steps which comprise twisting and winding a thread freed from acid and dried on a spinning bobbin onto a bobbin the circumference of which can be varied, loosening the lap of threads formed on the bobbin, and subjecting the loosened lap on said bobbin to an irrigating treatment with the after-treating liquids.

2. In the manufacture of artificial silk according to the bobbin spinning system the steps which comprise introducing in a bobbin which has been slit in the direction of its longitudinal axis a core of a somewhat larger diameter than has the slit bobbin thus increasing the diameter of the same, twisting and winding a thread, freed from acid and dried on a spinning bobbin onto said bobbin to form a lap, removing the core from said bobbin, thus loosening the lap, and subjecting the loosened lap on said bobbin to an irrigating treatment with the after-treating liquids.

3. In the manufacture of artificial silk according to the bobbin spinning system the steps which comprise introducing in a bobbin which has been slit in the direction of its longitudinal axis a core of a somewhat wider diameter than has the slit bobbin at both of its ends, twisting and winding a thread free from acid and dried on a spinning bobbin onto said bobbin to form a lap, removing the cores from said bobbin, thus loosening the lap, and subjecting the loosened lap on said bobbin to an irrigating treatment with the after-treating liquids.

4. In the manufacture of artificial silk according to the bobbin spinning system the steps which comprise covering a bobbin which has been slit in the direction of its longitudinal axis with a baggy covering, introducing in said bobbin a core having a somewhat wider diameter than said slit bobbin, twisting and winding a thread freed from acid and dried on a spinning bobbin onto said bobbin to form a lap, removing the core from said bobbin, thus loosening the lap, and subjecting the loosened lap on said bobbin to an irrigating treatment with the after-treating liquids.

5. In the manufacture of artificial silk according to the bobbin spinning system the steps which comprise covering a bobbin which has been slit in the direction of its longitudinal axis with a baggy covering standing over both ends of said bobbin, turning the overstanding ends into the interior

of said bobbin, introducing a core having a somewhat wider diameter than said slit bobbin into the latter at both its ends thereby fixing said cloth, twisting and winding a thread freed from acid and dried on a spinning bobbin onto said bobbin, to form a lap, removing the cores from said bobbin, thus loosening the lap, and subjecting the lap on the covering and on said bobbin to an irrigating treatment with the after-treating liquids.

6. In the manufacture of artificial silk according to the bobbin spinning system the steps which comprise covering a bobbin which has been slit in the direction of its longitudinal axis with a baggy covering standing over both ends of the bobbin, turning the overstanding ends into the interior of said bobbin, introducing a core having a somewhat wider diameter into the latter at both its ends, thereby fixing said cloth, twisting and winding a thread freed from acid and dried on a spinning bobbin onto said bobbin to form a lap, wrapping said lap into said covering, and subjecting the wrapped lap on said bobbin to an irrigating treatment with the after-treating liquids.

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