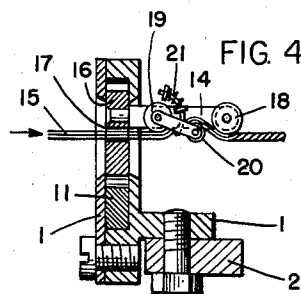
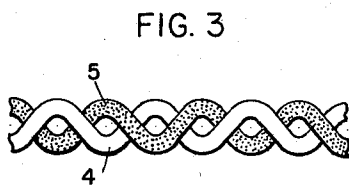
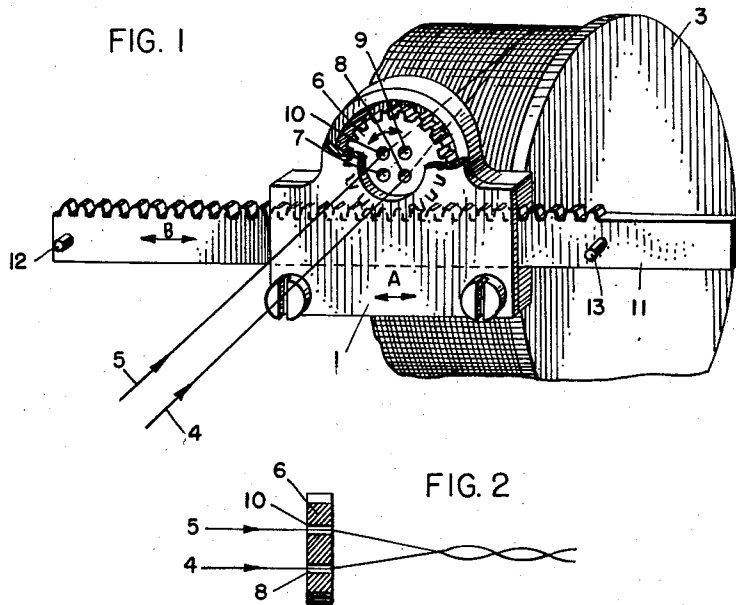


April 21, 1959

W. LENK
METHOD AND APPARATUS FOR SIMULTANEOUSLY WINDING
A PLURALITY OF THREADS ON A SINGLE BOBBIN
AND ARTICLE PRODUCED THEREBY
Filed Feb. 3, 1956

2,882,674



INVENTOR:
WALTER LENK
BY
Margall, Johnston, Cook & Bost
ATT'YS

1

2,882,674

METHOD AND APPARATUS FOR SIMULTANEOUSLY WINDING A PLURALITY OF THREADS ON A SINGLE BOBBIN AND ARTICLE PRODUCED THEREBY

Walter Lenk, Remscheid-Lennep, Germany, assignor to Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal-Oberbarmen, Germany

Application February 3, 1956, Serial No. 563,353

Claims priority, application Germany February 8, 1955

13 Claims. (Cl. 57—66)

This invention relates to a method and apparatus for winding a plurality of threads simultaneously on a winding bobbin.

In producing a spooled thread it is often desired to wind two or more separate threads simultaneously on the same bobbin. The threads are customarily fed to the winding bobbin in a ribbon-like band and wound thereon in the same form. However, it is difficult to obtain even winding since the threads tend to cross over each other. As a result, snarls frequently occur on later removal of the thread. To avoid the uneven winding, spring urged or weighted devices have been employed to equalize the tension on the threads as they are wound on the bobbin. However, these devices operate imperfectly and individual threads often force their way between threads in lower layers. This not only makes removal of the thread difficult but also causes variations in the lengths of the individual threads.

One of the objects of the invention is to provide a method and apparatus for winding a plurality of threads simultaneously on the same bobbin which produces uniform layers of thread which can be removed in subsequent operations without snarling.

Another object of the invention is to provide a method and apparatus for winding a plurality of threads simultaneously on the same bobbin which produces uniform lengths of thread which are easily removed in subsequent operations.

In accordance with the invention these objects are accomplished by a method and apparatus in which the several threads are twisted periodically in opposite directions as the threads are wound upon the bobbin. As a result, a simulated or pseudo twist is imparted to the wound threads. The alternations in the direction of twist may follow each other very rapidly. For example, where two threads are being wound on the bobbin, the direction of twist may be alternated after as little as one cross-over. Since the twist resulting on the wound thread periodically alternates its direction, the thread drawn from the bobbin in a subsequent use automatically reverts to the ribbon-like form wherein the individual threads lie parallel to each other.

The device for twisting the threads comprises a rotatable guide means engaging and guiding the individual threads toward the bobbin, and reciprocating means operatively associated with the guide means for rotating the guide means periodically in opposite directions. The periodic rotation in opposite directions of the guide means is preferably about an axis parallel to the running direction of the thread. The device for twisting the threads is situated immediately preceding the winding bobbin so that the threads are twisted immediately prior to or at the instant of winding upon the bobbin and may, if desired, be combined with a conventional thread layer device.

The invention will be more clearly understood by reference to the accompanying drawings in which like num-

2

bers are used throughout to indicate like parts, and wherein:

Fig. 1 is a perspective view of an apparatus according to the invention;

Fig. 2 is a sectional view of a part of the apparatus shown in Fig. 1;

Fig. 3 is an enlarged plan view of a pair of threads twisted according to the invention; and

Fig. 4 is a side elevational section of another form of apparatus according to the invention.

A preferred embodiment of the invention is exemplified in Figs. 1 and 2 and partially in Fig. 4 in which 1 is a conventional thread layer device mounted on a thread layer rod 2 so as to reciprocate in the directions shown by the arrows A in front of the winding bobbin 3 with the completion of each layer of thread. A device for twisting the threads 4 and 5 being wound on the bobbin 3 is incorporated in the thread layer 1 and includes a pinion wheel 6 provided with a plurality of guide holes 7, 8, 9, and 10, which engage and guide the individual threads (in this case the two threads 4 and 5) toward the bobbin. A reciprocating rack 11, moving in the directions of the arrows B between stops 12 and 13, drivingly engages the pinion wheel 6 so that the pinion wheel is rotated periodically in opposite directions, and a simulated twist (shown in Fig. 3) is imparted to the threads as the threads are wound upon the bobbin 3. Instead of the pinion 6 and the rack member 11, friction members may be employed, i.e. a wheel frictionally engaged by a reciprocating rod. The number of guide holes employed in the pinion 6 may be varied but is preferably equivalent to the number of threads to be combined. The motion of the twister device, i.e. rack 11 and pinion 6, may be independent from the reciprocating motion in the directions A of the thread layer 1 or may be coupled to it. In the latter case the pinion could be driven with the motion A of the thread layer 1 by engaging fixed racks located on both sides of the thread layer rod 2.

A further embodiment of the invention is shown in Fig. 4 in which the twister device includes a guide-roller member 14 frictionally engaging and guiding the threads 15 toward the bobbin. The guide-roller member 14 is eccentrically mounted on a pinion wheel 16 having a central bore 17 for passage of the threads 15. The pinion wheel 16 is drivingly engaged by the reciprocating rack 11, as in Fig. 1, so that the pinion wheel with the guide-roller member 14 thereon is rotated periodically in opposite directions and a simulated twist is imparted to the threads as the threads are wound upon the bobbin. The guide-roller member may consist of a single roller around which the threads are looped so as to be frictionally engaged or may consist of upper rollers 18 and 19 and a lower roller 20, as shown in Fig. 4. The lower roller 20 is urged upwardly by a spring 21 so as to frictionally engage the threads passing between lower roller 20 and the upper rollers 18 and 19.

The simulated twist imparted to the threads wound upon the winding bobbin results in uniform layers of thread with no tendency of the individual threads to work their way down into lower layers, and since the thread has been twisted alternately in opposite directions, the twist is automatically undone as the threads are drawn from the spool. As a result, the wound spools have even lengths of thread which are easily removed for subsequent operations.

The invention is hereby claimed as follows:

1. In a machine for winding a plurality of threads simultaneously on a winding bobbin, reciprocable means for distributing the threads in layers on the bobbin, said means including a rotatable guide means engaging and guiding the individual threads toward the bobbin and re-

reciprocating means operatively associated with the guide means for rotating the guide means periodically in opposite directions a plurality of times while said rotatable guide means is in reciprocable movement in a given direction whereby a simulated twist is imparted to the threads as the threads are wound upon the bobbin.

2. In a machine for winding a plurality of threads simultaneously on a winding bobbin, reciprocable means for distributing the threads in layers on the bobbin, said means including a guide means engaging and guiding the individual threads toward the bobbin, said guide means having a pinion rotatable therewith and a reciprocating rack drivingly engaging the pinion for rotating the guide means periodically in opposite directions during the reciprocal movement of said guide means in a given direction whereby a simulated twist is imparted to the threads as the threads are wound upon the bobbin.

3. In a machine for winding a plurality of threads simultaneously on a winding bobbin, reciprocable means for distributing the threads in layers on the bobbin, said means including a pinion wheel provided with a plurality of guide holes engaging and guiding the individual threads toward the bobbin, and a reciprocating rack drivingly engaging the pinion wheel for rotatably oscillating the pinion wheel periodically in opposite directions during the reciprocal movement of said pinion wheel in a given direction whereby a simulated twist is imparted to the threads as the threads are wound upon the bobbin.

4. In a machine for winding a plurality of threads simultaneously on a winding bobbin, a device for twisting the threads being wound on the bobbin, said device comprising a guide-roller member frictionally engaging and guiding the threads toward the bobbin, said member being eccentrically mounted on a pinion wheel, and a reciprocating rack drivingly engaging the pinion wheel whereby the pinion wheel with the guide-roller member thereon is rotated periodically in opposite directions and a simulated twist is imparted to the threads as the threads are wound upon the bobbin.

5. In a machine for winding a plurality of threads simultaneously on a winding bobbin, a device for simulated twisting of the threads being wound on the bobbin, said device comprising roller means adapted to frictionally engage the threads, said roller means being mounted on a rotatable member, and drive means associated with said member for rotatably oscillating said member and the roller means thereon whereby said member and the roller means thereon are rotated periodically in opposite directions and a simulated twist is imparted to the threads as the threads are wound upon the bobbin.

6. The method of winding in superposed, uniform layers a plurality of threads simultaneously on a winding bobbin while twisting the threads in opposite directions with rapid alterations in the direction of twist as the threads are wound in said superposed layers upon the bobbin, the rate of alterations in direction of twist providing only about one cross-over of the wound threads in each direction, whereby a simulated twist is imparted to the wound threads.

7. A method for winding a plurality of threads simultaneously on a winding bobbin comprising winding said threads on said bobbin in uniform layers by moving the thread path longitudinally along the winding bobbin while twisting the threads periodically in opposite directions with rapid alterations in the direction of twist just prior to contact of the threads with the bobbin and thread

wound thereon to provide a plurality of alternating twists in a given thread layer on said bobbin.

8. In a machine for winding a plurality of threads simultaneously on a winding bobbin, a winding bobbin, means reciprocable longitudinally of said winding bobbin for distributing the threads in layers on said bobbin, said means including a rotatable thread-twisting means for twisting the threads just prior to winding thereof on said bobbin with drive means operable independently of said first-mentioned means and operatively associated with said thread-twisting means for rotatably oscillating said thread-twisting means during reciprocation of said first-mentioned means, whereby a simulated twist is imparted to the threads as the threads are wound in layers upon the bobbin.

9. The combination of claim 8 wherein said thread-twisting means has a pinion rotatable therewith and the drive means for rotatably oscillating said thread-twisting means is a reciprocating rack drivingly engaging the pinion.

10. In a machine for winding a plurality of threads simultaneously on a winding bobbin, a winding bobbin, thread-twisting means adjacent said winding bobbin and reciprocable longitudinally of said winding bobbin for twisting the threads just prior to winding thereof on said bobbin, and drive means operatively associated with said thread-twisting means for rotatably oscillating said thread-twisting means a plurality of times while said thread-twisting means is in longitudinal motion in a given direction.

11. A method for winding a plurality of threads on a winding bobbin comprising simultaneously winding the threads in successive, superposed, uniform layers on a rotating winding bobbin while imparting a multiple number of periodic twists in alternating directions to the threads in each layer on the winding bobbin as they are wound thereon to give a simulated twist to the threads in each layer.

12. A method for winding a plurality of threads on a winding bobbin comprising reciprocally guiding the threads longitudinally of a rotating winding bobbin to distribute the wound threads in successive layers on said bobbin, and imparting at the point of reciprocal guiding a twisting motion to the threads, immediately prior to their winding upon said bobbin, about each other with rapid alterations in the direction of twist during the reciprocal guiding movement of the threads in a given direction of reciprocal movement, whereby the wound threads in a given layer on said winding bobbin have a simulated twist.

13. A bobbin having a thread body wound thereon comprising a bobbin upon which is wound a plurality of threads distributed in successive layers on the bobbin, the threads in each layer being twisted about each other periodically in a multiple number of twists in opposite directions.

References Cited in the file of this patent

UNITED STATES PATENTS

533,934	Wardwell	Feb. 12, 1895
1,021,448	Cotter	Mar. 26, 1912
1,389,392	Stocker	Aug. 30, 1921
1,866,272	Seeley	July 5, 1932
2,370,899	Wildboce	Mar. 6, 1945