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2,231,092

METHOD OF WINDING CORD PACKAGES

Filed July 25, 1938

3 Sheets-Sheet 1

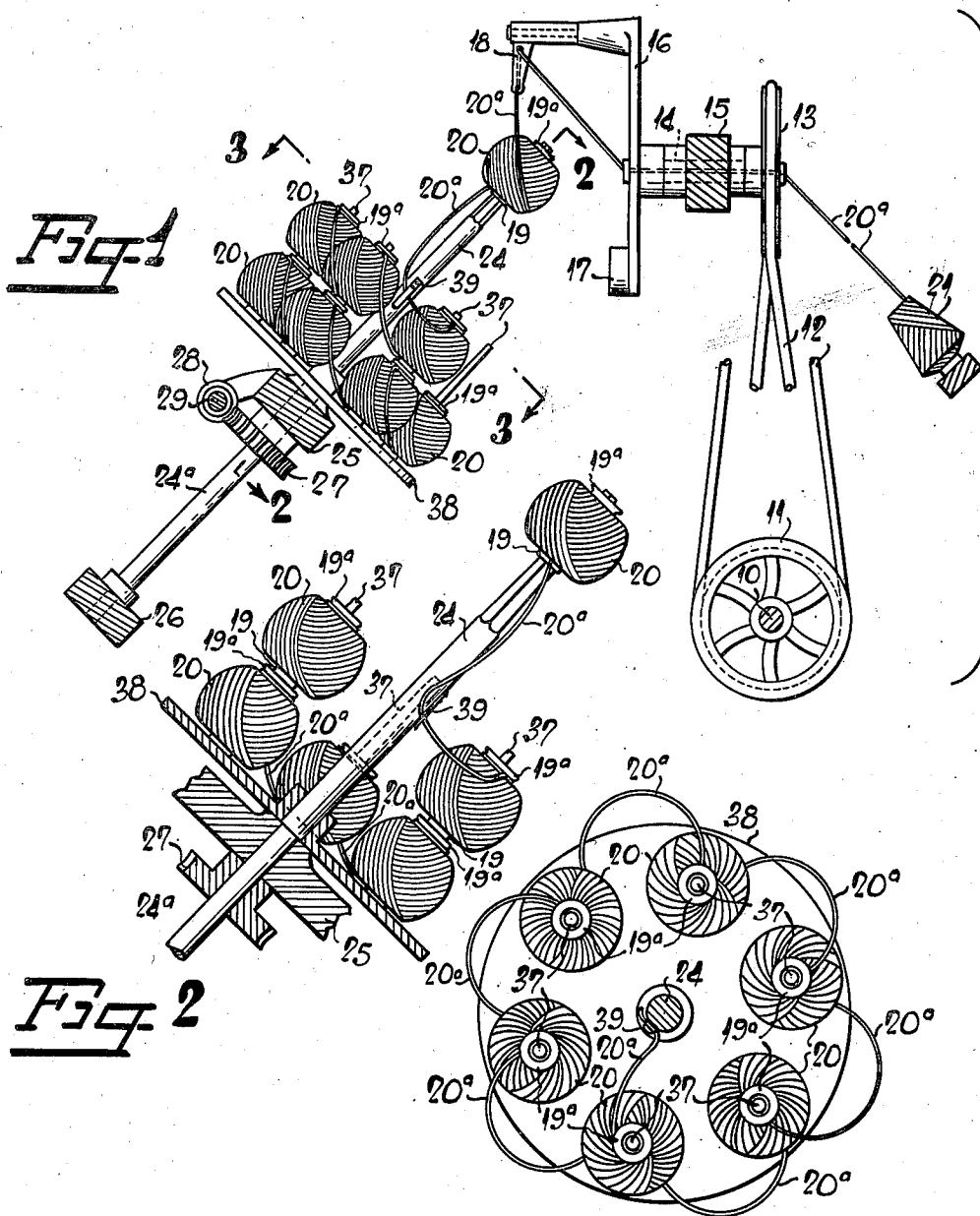


Fig. 3

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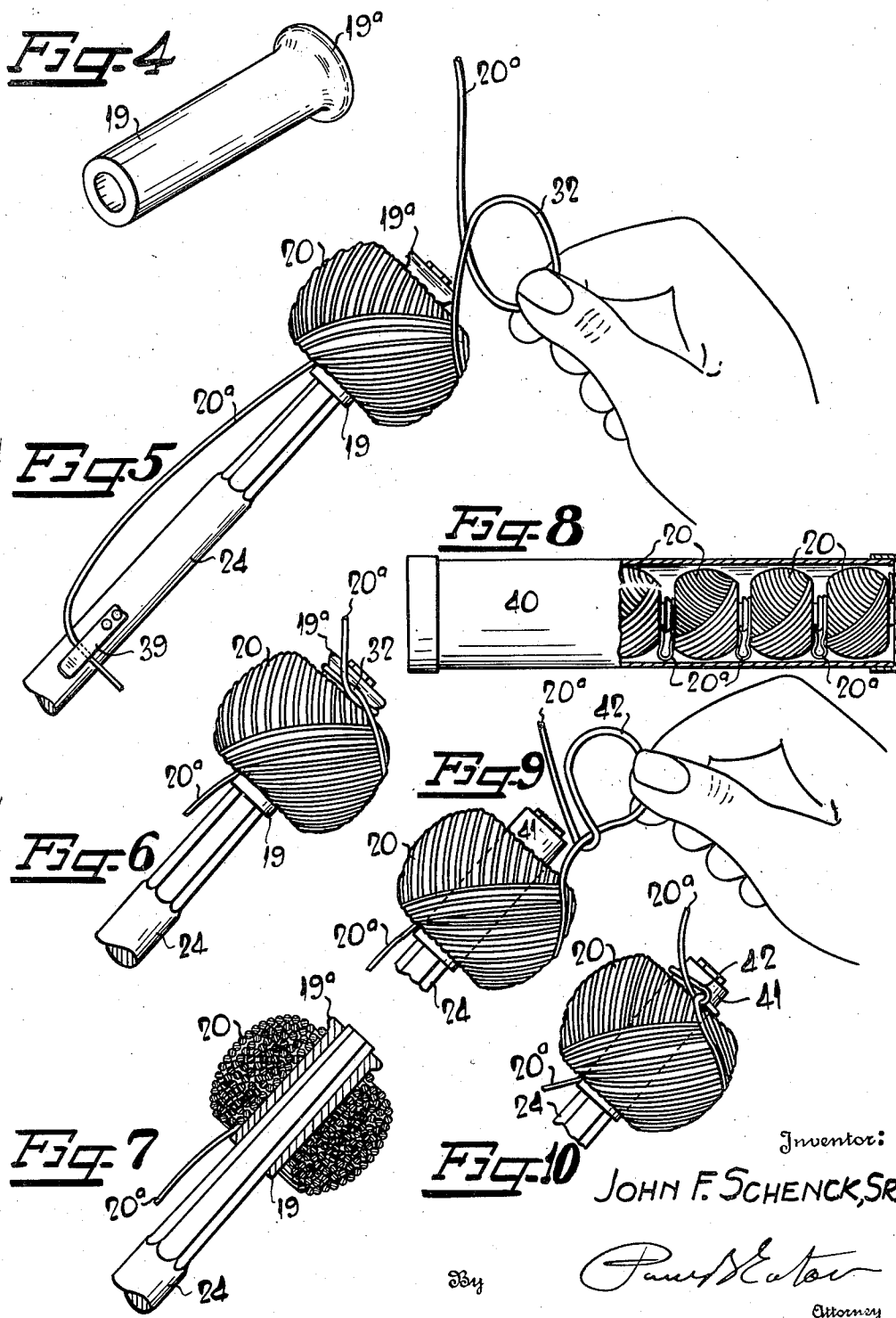
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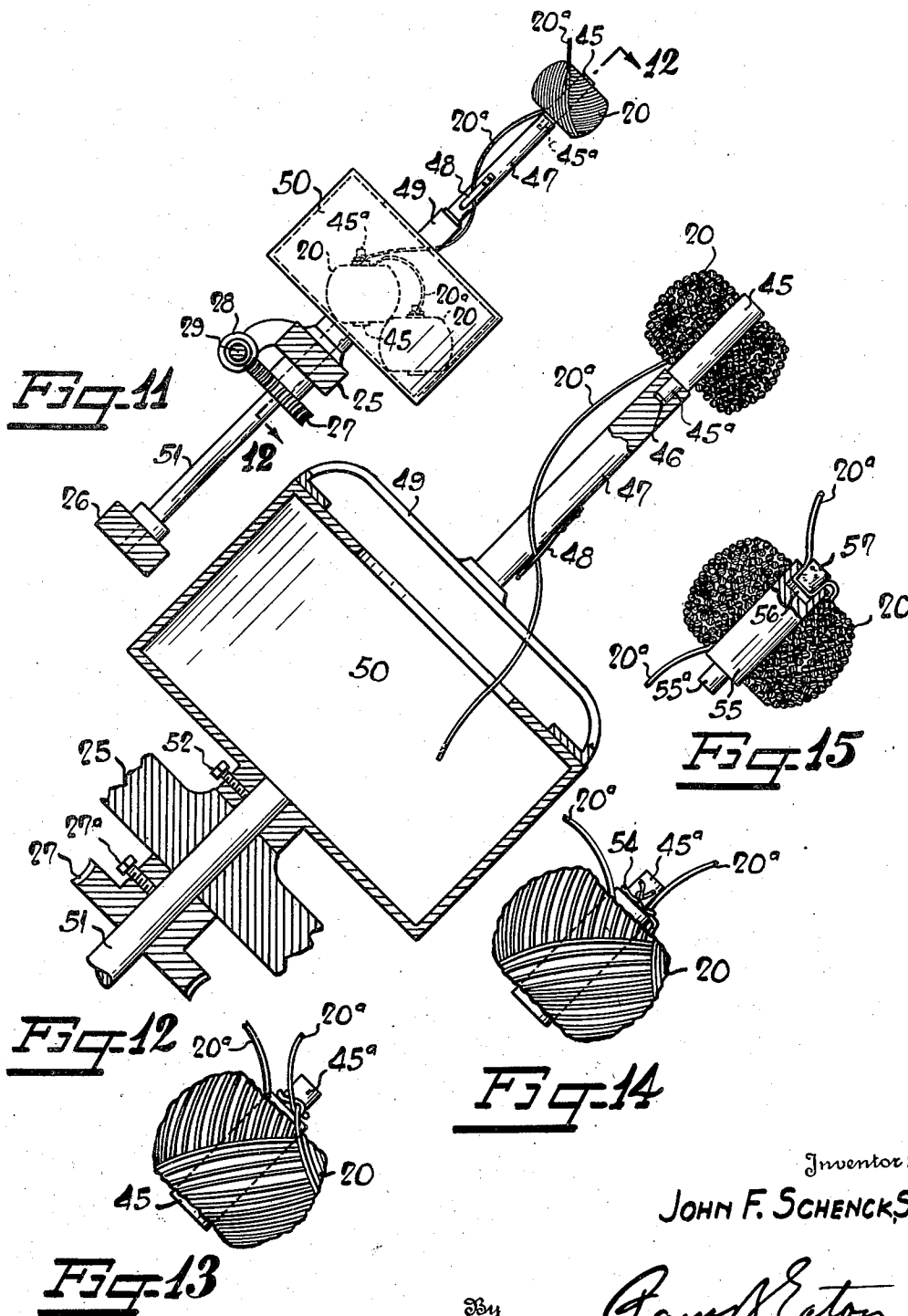
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METHOD OF WINDING CORD PACKAGES

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3 Sheets-Sheet 3



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METHOD OF WINDING CORD PACKAGES

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Application July 25, 1933, Serial No. 221,049

5 Claims. (Cl. 242—2)

This invention relates to a method and means for packaging cord, yarn and the like, whereby a continuous strand can be wound into a number of packages with the strand proceeding from the finished package to the beginning of another package. More particularly it relates to a method and means for winding interconnected packages of cordage upon cores from a single strand with means for securing the strand to the core at the beginning of the winding and also at the finishing of the winding of each package, so as to prevent sloughing of the cord after it has been wound.

Heretofore, in my Patent No. 2,095,765 of October 12, 1937, I have provided means for winding interconnected packages and for securing the outer and inner layers of the cord to prevent sloughing, which entailed the use of an additional cord, or other fastening element, and also which entailed a great deal of additional time. The present invention has means for securing the cord at the beginning and at the end of the winding to the core upon which the package of cord is wound without entailing the use of an additional cord, or other fastening element. When the package has been completed, the strand is looped or otherwise fastened to the core to secure the outer layer of the cord in position. The inner layer of cord is secured to the core by virtue of the pressure of the successive layers which are wound thereon.

It is, therefore, an object of this invention to provide a method and means for winding a plurality of balls, from one unsevered length of cord, onto cores, attaching the core to the spindle of a winder, which spindle is provided with a receptacle to rotate with the spindle; said method comprising the winding of balls, one at a time, on a core, then to prevent sloughing of the outside layer of the ball, fasten it to the core, either before the core with its cord, is removed from the spindle, or after it is removed from the spindle, and transferring the cored ball from the spindle to the receptacle which is located on and revolves with and may be a part of the spindle.

It is preferable to have a protruding core, with an enlarged end, so that, after the package of cord is wound the outside layer of the ball may be easily looped around the enlarged end of the core and be held securely. It is seen that this provides a very economical method of securing the outer layer of the cord to the core, which does not entail an additional member, and which may be easily released by the user.

Some of the objects of the invention having

been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

Figure 1 is a sectional view through portions of a ball winder showing the invention applied thereto;

Figure 2 is an enlarged sectional view taken along the line 2—2 in Figure 1;

Figure 3 is an enlarged sectional view taken along the line 3—3 in Figure 1;

Figure 4 is an isometric view of a spool or core upon which a package of cord in one form of the invention is adapted to be wound;

Figure 5 is an enlarged view of the upper portion of a spindle with a package of cordage wound thereon and showing the method employed for securing the outer layer of cord to the core to prevent sloughing;

Figure 6 is a view similar to the upper portion of Figure 5, but showing the outer layer after it has been secured to the core;

Figure 7 is a vertical sectional view through the package of cord and the core, but showing the spindle in elevation;

Figure 8 is a view of a tube containing a plurality of balls formed according to the invention, said tube being partly in elevation and partly in section;

Figure 9 is a view similar to Figure 5 but showing the package of cordage wound upon a different form of core and also showing a different loop for securing the outer layer to the core;

Figure 10 is a view similar to Figure 9, but showing the outer layer after having been secured to the core.

Figure 11 is a transverse sectional view similar to Figure 1, but showing a slightly modified form of the invention;

Figure 12 is an enlarged sectional view taken along the line 12—12 in Figure 11;

Figure 13 is a view showing a completed ball of cordage having its ends fastened to the core upon which it is wound;

Figure 14 is a view similar to Figure 13, but showing another method of securing the trailing end of the cord to the core after the package has been completed;

Figure 15 is a sectional view showing still another modified form of securing the loose end of cordage to the core.

Referring more specifically to the drawings, the numeral 10 denotes the main drive shaft of a conventional ball winder which has a sheave pulley 11 mounted thereon which, in turn, has mounted thereon a belt 12, said belt extending up-

wardly and also being mounted on a sheave pulley 13. The sheave pulley 13 is fixedly secured on one end of a hollow flyer shaft 14 which shaft is rotatably mounted in longitudinal beam 15 of the ball winder. On the other end of shaft 14 is fixedly secured a flyer 16, having a counterweight 17 on one end thereof and a thread guide 18 on the other for guiding the thread or cord to the proper position so that it can be wound upon suitable cores 19 to form packages 20. When rotation is imparted to shaft 14 the sheave pulley 13 is likewise caused to rotate which, in turn, rotates the flyer 16 and its associated parts to cause strand 20a to be drawn from a cone 21 through the interior of shaft 14 and onto package 20, which is disposed on the upper end of a spindle 24. The spindle 24 has a lower restricted portion 24a which is rotatably mounted in longitudinal beams 25 and 26.

A worm gear 27 is fixedly secured on the restricted portion 24a and is adapted to mesh with a worm 28 fixedly secured on a shaft 29. The spindle 24 is so geared with respect to shaft 29 that one complete revolution is made each time a layer of cord or yarn is wound around the package 20, that is to say, when one revolution of the spindle 24 is made, a plurality of revolutions are made by flyer 16. Since the flyer rotates in one direction at a rapid speed and the spindle rotates in the opposite direction at a slow speed, a transverse wind is produced.

It should be noted that the upper end of the core or spool 19 has a flanged bell-shaped rim 19a. After the package of cord 20 has been wound, the operator grasps the cord close up to the outer layer (Figure 5) and forms a suitable loop 32 therein and then places this loop over the projecting end of core 19 and adjacent the flanged rim 19a after which the loop is tightened to the position shown in Figure 6. After this operation has been performed, the cord is not severed but immediately the package is transferred from the spindle to a pin 37 which pin is secured in a suitable plate or table 38 disposed on spindle shaft 24. A plurality of pins 37 are disposed in the plate in order that a plurality of finished balls or packages of cord 20 may be accommodated. In the present instance, space has been provided whereby a dozen balls may be accommodated before severing the strand 20a.

By referring to Figures 1, 2 and 5 it will be noted that a leaf spring clamp 39 is secured to the side of spindle shaft 24 in order that the intermediate portions 20a of the cord between the ball, which is disposed on pin 37, and the ball which is being wound on the spindle might be clamped to the spindle and held securely while the next ball is being wound on the spindle. Of course, when a ball has been wound and the loop 32 tied, the intermediate length 20a of the twine between the balls which is under the clip is removed therefrom and then the finished ball 20 is placed on a pin. After this has been done a portion of the same strand disposed on the upper side of the ball is placed under the clamp 39 and then the process of winding another ball is repeated.

In Figures 1 to 7, inclusive, I have shown a single loop for securing the outer layer of cordage to the core 19, but it is to be understood that any desired type of loop may be utilized without departing from the spirit of the invention. In any event, it is seen that the inner layer of cord is secured to the core 19 by the pressure of the succeeding layers which are wound thereon, and

the outer layer of the cord is secured to the core by means of a suitable loop which is wrapped around the enlarged end of the core.

Figure 8 shows a tube 40 which contains a plurality of packages or balls 20 therein wound in series from one continuous strand. It is evident that when a retailer desires to sell a continuous cord, which has no knots therein, almost any continuous length, within certain limits, can be obtained without the necessity of carrying a 10 number of different length balls of yarn or cord in stock. For example, by using this method, a dozen balls with fifty feet in each ball can be packed in one container, and if the retailer desires, he can sell any number of yards in one continuous length varying in units from fifty feet to six hundred feet by merely severing the cord disposed between two adjacent fifty foot balls at the desired point.

Figures 9 and 10 show a package of cord after it has been wound upon a slightly different form of core and having the outer layer of the cord secured to the core by a double loop instead of a single loop as shown in the preceding figures. In this form a cylindrical core 41 is employed, which has the same outside diameter throughout its length. One end of the core projects a substantial distance from the package 20. After the package has been completely wound, the operator grasps the unsevered cord adjacent the outer layer and forms a double loop 42 therein (Figure 10). This loop is placed around the projecting end of the core, and then tightened to the position shown in Figure 10.

Figures 11, 12 and 13 show still another modified form of the invention. In this form the package of cordage, yarn or the like 20 is wound around a core 45 which core has integral with one end thereof, a restricted projection 45a, said projection being adapted to fit in a suitable cavity 46 in the upper end of a spindle 47. This spindle has a spring clip 48 secured thereto for clamping the strand 20a intermediate the balls of twine. The lower end of the spindle 47 is secured to a U-shaped bar 49 and this bar has its end secured to the upper portion of receptacle 50. The receptacle 50 may be of any desired material or shape and is used for placing the wound balls therein after being removed from the upper end of the spindle 47. In other words, the receptacle 50 answers substantially the same purpose as table 38 and its associated pins 37; however, it should be noted that it is necessary to use a receptacle of this type, especially when a solid core 45 is used instead of a tubular member such as indicated by reference characters 19 and 19a in the preceding figures of the drawings.

The lower portion of the receptacle 50 is secured to a spindle 51 by any suitable means such as set screw 52. The spindle 51 is merely a continuation of the spindle 47 and it has worm gear 27 secured thereon by means of set screw 27a.

After the package 20 has been wound properly upon core 45, the core is removed from the upper end of the spindle and the unsevered trailing end of cordage 20a is secured to the end of the core by any suitable fastening means such as looping, tying, and the like. In Figure 13 the loose end 20a is secured by means of a single loop which is fastened over the restricted portion 45a. In Figure 14, the loose end 20a is secured on the restricted end portion 45a by means of an additional cord 54 which is tied around the restricted portion 45a and the loose end 20a. In Figure 15,

a core 55 is shown having restricted portions 55a integral therewith and also having a cavity 56 in one end thereof. When a core of this type is used, the loose unsevered end 20a is secured to the core by means of inserting a suitable plug 57 in the cavity on top of a doubled portion of the unsevered end.

While I have shown several types of fastening means for securing the outer layer to the core, I desire it to be understood that these means are merely illustrative of the fact that any desired type of fastening means may be employed to prevent the outer layer from sloughing.

I also desire it to be understood that although I have shown two different forms of receptacles for holding wound balls, it is to be understood that any suitable receptacle may be provided on the spindle for holding the balls while additional balls are being wound.

In the drawings and specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the appended claims.

I claim:

1. That method of winding cord into a plurality of balls onto tubes from one unsevered length of cord employing a winding spindle provided with a table to rotate with the spindle, which comprises winding a ball on a tube on the spindle, then securing the last round of cord on the wound ball against sloughing by looping the cord around the end of the tube, then transferring the wound ball with its tube, from the spindle onto the table and winding succeeding balls in the same manner without severing the cord.

2. That method of winding cord into a plurality of connected balls, on tubes disposed on a winding spindle provided with a table adapted to rotate with the spindle, which comprises winding a ball on a tube on the spindle, looping the last

round of cord around the end of the tube, removing the ball when wound with its tube from the spindle and mounting the completed ball on the table and winding additional balls in the manner described, whereby a continuous length of cord can be wound into a plurality of interconnected balls.

3. That method of winding cord and the like on tubes on a spindle provided with a table to rotate with the spindle, which comprises winding a ball on a tube disposed on the spindle, then looping the last round of the cord around the end of the tube and transferring the ball from the spindle to the table and continuing to wind the unsevered cord on other tubes disposed one at a time on said spindle.

4. That method of winding cord into a plurality of packages from a continuous and unsevered length of cord on cores disposed on a spindle provided with a receptacle to rotate with the spindle; which comprises placing a core on the spindle, winding a ball on the core so that the inside layers are covered by the succeeding layers, then securing the last round of cord to the core, then transferring the wound ball along with its core on which the ball is wound, from the spindle to the receptacle, placing another core on the spindle and thus continuing the process until a plurality of balls have been wound without severing the winding cord.

5. That method of winding cord into a plurality of connected packages which comprises winding a package on a core disposed on a spindle, fastening the last round of cord to the core on which it is wound, removing the package and its core and supporting the completed package by a member mounted to rotate with the spindle, and winding additional packages in the manner described, whereby a continuous length of cord can be wound into a plurality of packages which will remain intact and will not slough while being handled.

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