

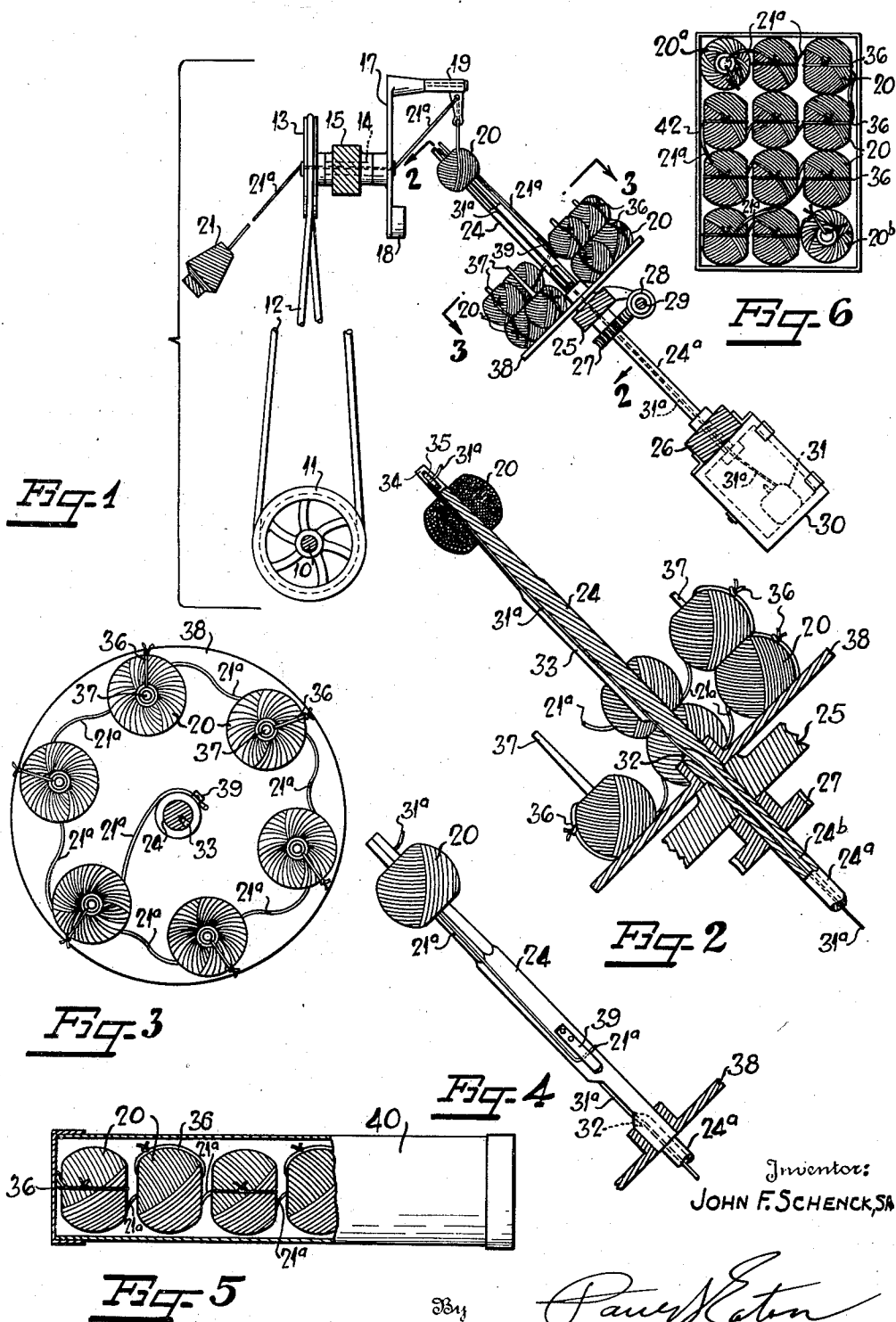
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METHOD AND MEANS FOR WINDING INTERCONNECTED PACKAGES

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METHOD AND MEANS FOR WINDING INTER-
CONNECTED PACKAGES

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This invention relates to 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 a finished package to the beginning of another package so that a plurality of balls of yarn or cord can be produced which can be packed together so as to provide connected packages of cord without any knot appearing in the cord either in the package or between the packages.

It is, therefore, an object of this invention to provide in a ball-winding machine means for supporting a finished ball of cord on the spindle on which the ball is wound so that the cord from the finished ball can be started at the winding point and another ball produced so that a plurality of balls of cord can be produced at one winding operation from a continuous strand. These balls may be packed in suitable containers for use or sale and any definite number of yards of the cord can be dispensed in units of, say fifty yards, or whatever unit is desired so that one continuous unit of cord can be provided with no knots therein.

It is a further object of this invention to provide in a ball-winding machine a table disposed on each spindle for supporting the finished balls of cord, yarn and the like, so that the cord can be led from a finished ball to the spindle where an additional ball is wound. Any desired number of such balls can be wound on the spindle and then stored on the table until the desired number have been wound, with all of their ends connected together. These balls can then be packed in a suitable container so that a customer can be supplied with as many balls of cord as he desires with no knots therein, thus eliminating the necessity of a merchant carrying in stock balls containing different amounts of yardage.

It is a further object of this invention to provide a continuous cord wound into a plurality of packages with their ends connected together in a continuous manner without any knots being present in the continuous length of cord.

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 drawing, 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 line 2—2 in Figure 1;

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

Figure 4 is an elevation of a portion of a spindle of a ball winder showing a portion of the invention applied thereto in section;

Figure 5 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 6 is a plan view of a box containing a plurality of packages of yarn wound in series from one continuous strand.

Referring more specifically to the drawing, the numeral 10 indicates 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 upwardly and being also 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 17 having a counterweight 18 on one end thereof and a thread guide 19 on the top end thereof for guiding the thread to the proper position so that it can be wound upon a suitable ball or package 20. When rotation is imparted to shaft 10 the sheave pulley 13 is likewise caused to rotate which, in turn, rotates the flyer 17 and its associated parts to cause the strand 21a to be drawn from cone 21 through the interior of shaft 14 and onto the ball 20 which ball is disposed on the upper end of spindle 24. 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 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 ball 20, that is to say, that when one revolution of the spindle 24 is made a plurality of revolutions is made by the flyer 17. 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.

Fixedly secured to longitudinal member 26 is a box 30 containing a ball of wrapping or tying twine 31. A strand of twine 31a is led from this ball upwardly through the bore 24b disposed within the portion 24a of spindle 24. This bore leads to the exterior of shaft 24 as at 32, and from this point the strand of twine passes upwardly into a suitable groove 33 in the enlarged portion of shaft 24, and thence upwardly inside

the ball 20. Near the top of the spindle 24 is a slot 34 in which a clamp 35 is located for clamping the end of the wrapping twine which is pulled from the ball 31. When a ball 20 has been wound so that a certain number of yards are contained therein, the ball is then tied by the wrapping twine 31a to form a band 36, before the ball is removed from the spindle in the manner shown in the drawing in order to prevent unwinding of the same.

It should be noted that the cord is not severed but immediately after the ball has been tied by a band 36 it is placed upon a pin 37 which pin is secured in a suitable plate or table 38 disposed on the spindle shaft 24. A plurality of pins such as 37 are disposed in the plate 38 in order that a plurality of finished balls 20 may be accommodated. In the present instance, space has been provided whereby one dozen balls may be accommodated before severing the strand.

By referring to Figure 4 it will be noted that a leaf spring clamp 39 is secured to the side of spindle shaft 24 in order that the intermediate portion of the yarn between the ball which is disposed on pin 37 and the ball which is being wound, might be clamped to the spindle 24 and held securely while the next ball is being wound on spindle 24. Of course when a ball has been wound and the band 36 is tied, the intermediate portion of the twine between the two balls which is under clip 39, is removed therefrom and then the finished ball 20 is placed on the pin. After this has been done, the 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 20 is repeated.

Figure 5 shows a tube 40 which contains a plurality of balls 20 therein wound in series from one continuous strand or cord. 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 number of different length balls of yarn or cord in stock. For example, by using this method, a dozen balls of fifty foot cords to 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.

Figure 6 shows a dozen balls disposed in a box 42 for shipment. It will be noted in this form of packing the cord, that all of these balls are in one continuous length, and may be severed to accommodate the customer. In this form of packing, the balls 20a and 20b are disposed in opposed corners of the box and are also packed lying on their ends in order that the merchant or purchaser may easily ascertain the balls having the two ends of the cord. The intermediate balls are packed on their sides as is customary in packing balls of twine of this type.

In the drawing 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 from one unsevered length of cord on a winding spindle provided with a table to

rotate with the spindle, which comprises winding the balls, one at a time, on the spindle, then transferring the wound balls of cord one at a time from the spindle to the table rotating therewith and winding succeeding balls without severing the cord.

2. That method of winding cord into a plurality of connected balls, one at a time, on a winding spindle provided with a table adapted to rotate with the spindle, which comprises winding the balls one at a time on the spindle, removing the balls as wound from the spindle and mounting the completed balls on the table, securing the cord to the spindle and winding additional balls in the manner described, whereby a continuous length of cord can be wound into a plurality of balls.

3. That method of winding cord and the like on a spindle provided with a table to rotate with the spindle, which comprises winding one ball at a time on the spindle, then transferring the ball to the table without severing the cord, securing the cord to the spindle, winding another ball, and continuing the above operations until the desired number of balls have been wound from one length of cord.

4. That method of winding a continuous length of cord into a plurality of connected packages on a spindle provided with a table to rotate with the spindle, which comprises winding one ball of cord at a time on the spindle, then transferring a ball when wound onto the table, securing the cord leading from the ball to the spindle, and continuing the winding operations to wind another ball without severing the cord between the balls.

5. That method of winding a plurality of packages of cord from one continuous length of cord on a spindle by means of a flyer, said spindle being provided with a table secured to the spindle for holding wound packages, which comprises imparting rotation to the spindle and flyer to wind a package of cord, stopping the spindle and flyer and removing the package from the spindle and placing it on the table, securing the cord to the spindle and winding another package from the same cord, and continuing the above described operations until the desired number of packages have been wound from one continuous length of cord.

6. Ball winding apparatus for packaging cord comprising a flier, a spindle mounted for rotation at an acute angle to the flier, means for imparting rotation to the flier to wind the cord into a ball on the spindle, a table mounted on the spindle for rotation therewith, means on the table for supporting balls of cord already wound on the spindle while connected to the spindle, means for clamping the cord on the spindle preparatory to winding a ball on the spindle, said spindle being hollow, a container secured to the lower end of the spindle, a ball of tying twine disposed in said container and passing through said spindle, the upper portion of said spindle having a longitudinally disposed slot communicating with the hollow portion of said spindle and in which the twine is adapted to rest while a ball is being wound, and means for securing the end of the twine in the upper end of the spindle.

7. Winding apparatus comprising a hollow spindle and means for imparting rotation to the same, a flyer mounted for rotation around the upper end of the spindle and having means for depositing a strand onto the upper end of the spindle, the upper portion of the spindle having a

groove therein whose lower end communicates with the hollow of said spindle, said hollow and groove being adapted to receive a tying twine and over which the ball is adapted to be wound, said twine being adapted to be tied on the exterior of the ball before it is removed from the spindle.

8. That method of winding cord into a plurality of balls from a continuous and unsevered length of cord, on a spindle provided with a receptacle to rotate with the spindle, which comprises winding balls, one at a time, on the spindle, securing the outside and inside layers of each ball so that the content of ball cannot slough, then transferring the wound balls, one at a time, from the spindle to said receptacle, and thus continuing this process until a plurality of balls are wound without severing the winding cord.

9. That method of winding cord into a plurality of connected balls which comprises winding the balls one at a time on a spindle, securing the external and internal layers of said balls with a

suitable means to prevent sloughing, removing the balls as wound from the spindle and locating the completed balls on a member mounted on the spindle, and winding additional balls in the manner described whereby a continuous length of cord can be wound into a plurality of balls which will remain intact and not slough while being handled.

10. That method of winding cord and the like on a spindle provided with a table, which comprises winding one ball at a time on the spindle, securing the outside and inside layers of the ball against sloughing, then transferring the ball to the table without severing the cord, attaching the winding cord again to the spindle and winding another ball and continuing the above operations until the desired number of balls have been wound from one length of cord.

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