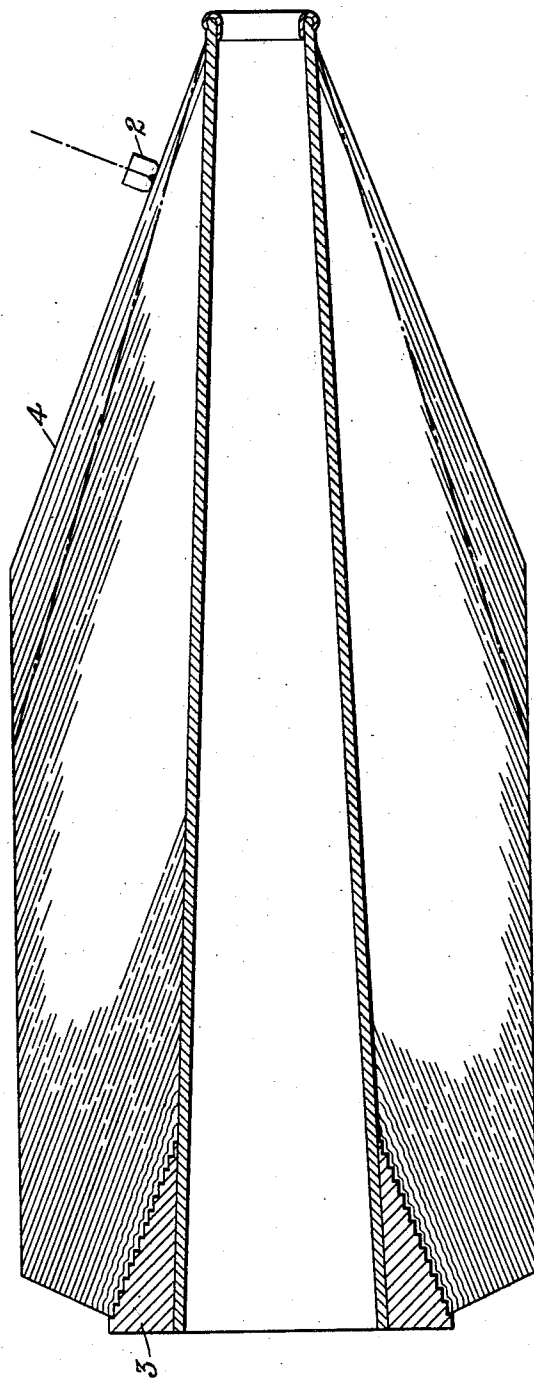


S. W. WARDWELL.
YARN PACKAGE.
APPLICATION FILED MAY 12, 1908.

998,057.

Patented July 18, 1911.



WITNESSES

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UNITED STATES PATENT OFFICE.

SIMON W. WARDWELL, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO SUPREME KNITTING BOBBIN COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

YARN-PACKAGE.

998,057.

Specification of Letters Patent.

Patented July 18, 1911.

Application filed May 12, 1908. Serial No. 432,450.

To all whom it may concern:

Be it known that I, SIMON W. WARDWELL, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Yarn-Packages, of which the following is a specification.

My invention is an improvement in yarn packages for supplying knitting machines and its purpose is to produce a package so built as to contain a greater quantity of material and deliver its contents more freely than bobbins usually employed for a like purpose. This I accomplish by a novel system of winding which is fully illustrated in the accompanying drawing.

The winding is accomplished on machines of that class in which the yarn depositing guide follows and bears against the winding surface or surface of deposit. By my novel system, a solid mass of yarn is built up, self sustained without any retaining head or supporting base, the resultant package having a relatively flat heel or bottom, a cylindrical body and a tapered delivery end or nose. The winding is accomplished through the thread-guide 2 of the winding machine which is traversed always in contact with the surface on which the yarn is deposited at the point of deposit, and the composition and form of the package is attained by first building up a substantially frusto conical base of yarn by gradually increasing the length of traverse of the guide, beginning with a relatively short traverse so that each layer of yarn is overlapped by the succeeding layers. This action continues until the full or normal length of traverse and outside diameter of the package are attained, after which the package is increased in volume by longitudinal extension with constant outside diameter, the length of guide traverse remaining constant but the path of traverse being progressively advanced along the bobbin or tube on which the winding is done until the package is completed.

The essential novelty of my invention consists in building the conical base, composed of yarn, with the angle of inclination of the path of travel of the thread-guide to the axis of the package constant, but its length variable. In other words, the first short layer initially deposited on the tube

or bobbin is deposited at exactly the same angle or with the same degree of taper as the last layer wound in completing the package. The length of traverse increases gradually from the first, initial layer, until that predetermined length of layer is attained which corresponds with the ultimate diameter of the package wound. Thereafter, the length of traverse remains constant, developing a cylindrical body for the package as described. This winding at a constant angle is obtained by means of what I please to term a form 3 on the bobbin which carries the yarn mass. This form has a length of face and degree of taper corresponding to the initial length of traverse of the guide and the inclination of the latter's path of travel to the axis of the package. The result secured by this expedient is distinctly novel for the reasons already indicated. It has been determined that a package so wound possesses the following substantial advantages over other packages for like purposes. The package is substantially solid yarn, for the form 3 is of inconsiderable size, its diameter being less than the diameter of the yarn mass at its base or in its cylindrical body. Because the winding is started on the form or starter 3 which presents a substantial foundation corresponding to the direction of travel of the thread guide, and because the latter follows and bears against the surface of the yarn mass, positively controlling the yarn and accurately depositing it in a predetermined manner, the nose or delivery surface 4 may be less acute than usual. This is indicated in the drawing where the dot-and-dash lines show the taper usually secured on bobbins of this character. The greater volume of yarn indicated obviously far outweighs the inconsiderable space occupied by the form 3.

Because the nose 4 is flatter than on the packages usually employed, the yarn is delivered to the knitting with unusual freedom. In delivering, the yarn is lifted off from the nose 4, rather than dragged over it thus further easing the delivery. More important still is the elimination of softness at the core, immediately adjacent the bobbin. As the guide 2 bears at all times directly and with pressure against the surface of deposit at the winding point, from the outermost portion clear down to the

tube, there is never any free yarn between
 the guide and the surface of deposit. There-
 fore the yarn is wound solidly and can be
 built upon with maximum tension. This is
 5 vital in winding with maximum density,
 which can only be attained when the core
 or interior mass is wound compactly and
 with precision. In windings where the
 yarn is not definitely controlled clear to the
 10 tube or bobbin, softness sometimes occurs.
 The constrictive action of the outer wind-
 ings, especially where much tension is em-
 ployed, causes the soft portion to flow, as it
 were. Inasmuch as there is but one unre-
 15 stricted direction for movement, viz: under
 and ahead of the guide, this soft portion is
 forced in that direction, into the path of the
 guide, obstructing it and disturbing its ac-
 20 tion. This is particularly true of packages
 of so large diameter as knitting supply bob-
 bins, because the constrictive effect increases
 with the diameter. These soft places can-
 not be obliterated by continued winding,
 but they rather increase with cumulative ill
 25 effect. By obstructing the guide, they cause
 distortion of the package. Of themselves,
 the protrusions of soft yarn impede the de-
 livery of the yarn, and sometimes even cause
 portions to slough off, instead of delivering
 30 properly. All of these ill effects are over-
 come however by winding as described in
 thin layers of constant inclination to the
 axis of the bobbin, so that the guide con-
 trols the yarn clear to the tube or bobbin.
 35 The form 3 must not be confounded with
 a bobbin head or base as ordinarily con-
 sidered, which consideration contemplates
 only a retaining or a supporting function.
 The mode of winding described, with the
 40 guide 2 in close contact at all times with
 the surface of deposit or winding, provides
 all the retention and support needed. The
 function of the form 3 is purely initiative,
 insuring that the first layer wound shall be
 45 of the same character and direction as the
 last, even though shorter, and without en-

croaching on the yarn containing capacity
of the package.

I do not here claim the novel form of
 bobbin employed, as that is subject of an- 50
 other application, Serial No. 432,449, filed
 May 12, 1908 but,

Without limiting myself to the nature
 of the material wound or the purpose for
 which it is employed, I claim: 55

1. In a yarn package the combination
 with a tube having a frusto-conical form 3
 at its base which is substantially less in ex-
 treme diameter than the outside diameter
 of the yarn mass of the package, of a yarn 60
 mass wound on said tube in superposed
 conical layers of constant taper having the
 same inclination as that of the frusto-coni-
 cal form 3, with the first layer of winding
 corresponding in length to that of the face 65
 of said form 3, and succeeding layers pro-
 gressively longer until a length of layer is
 reached which corresponds with the diam-
 eter of the package, and all layers thereafter
 of constant length. 70

2. In a yarn supply for knitting ma-
 chines, the combination with a tube having
 a form 3, substantially less in extreme di-
 ameter than the extreme diameter of the
 yarn mass of the supply and of a taper cor- 75
 responding to the inclination of path of
 travel of the thread guide 2, and a yarn
 mass wound on said tube in superposed
 conical layers of constant taper, the first
 layer corresponding in length to that of the 80
 face of the said form 3, and succeeding lay-
 ers progressively longer until that length of
 layer is secured which corresponds with the
 diameter of the package, and all layers
 thereafter of constant length to the comple- 85
 tion of the package.

In testimony whereof I affix my signa-
 ture in presence of two witnesses.

SIMON W. WARDWELL.

Witnesses:

ARTHUR I. HARVEY,
 EDWIN C. SMITH.