S. W. WARDWELL.

YARN PACKAGE.

APPLICATION FILED SEPT. 5, 1905.

903,641. Patented Nov. 10, 1908.

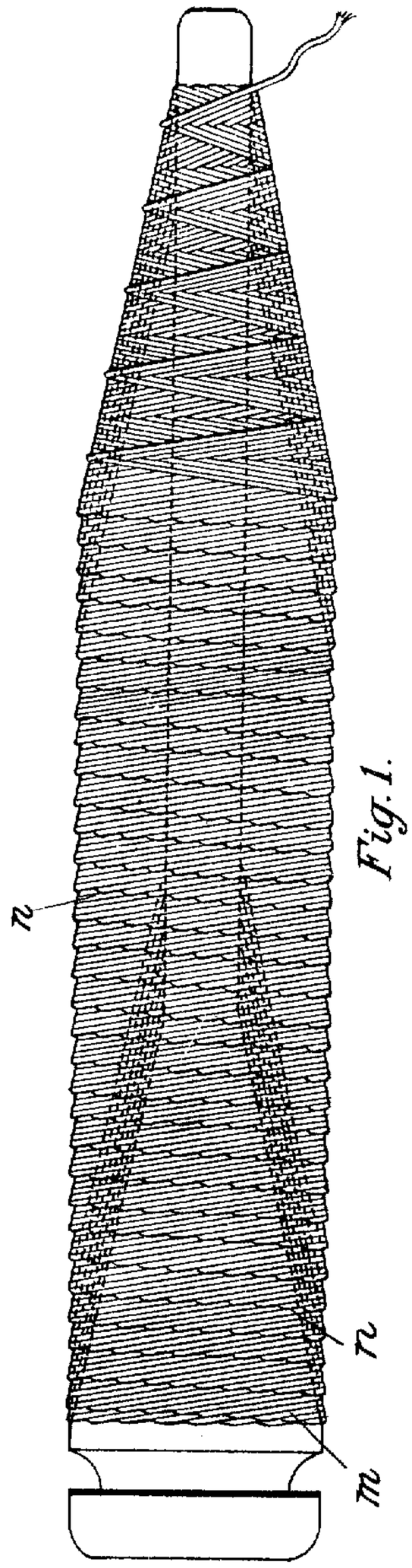

Fig. 1.

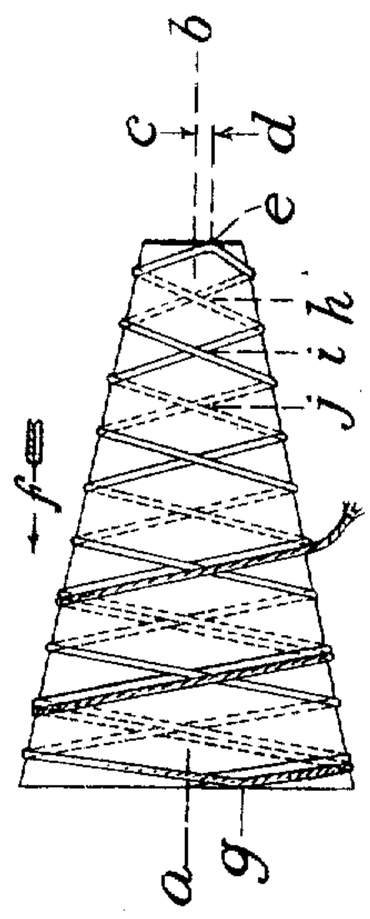

Fig. 2.

WITNESSES

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SIMON W. WARDWELL, OF PROVIDENCE, RHODE ISLAND.

YARN-PACKAGE.

No. 903,641. Specification of Letters Patent. Patented Nov. 10, 1908.

Application filed September 5, 1905. Serial No. 277,045.

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 supply packages for shuttles, particularly for cloth loom shuttles. Its purpose is to make more available for weaving operations, the advantage already imparted by the "Universal system" of winding to other textile and analogous operations; viz, increased yarn capacity for the package, and uniform yarn delivery from the package.

The accompanying drawing, forming a part of this specification, clearly shows the embodiment of my improvement, in which:

Figure 1 is a view of the completed bobbin: and Fig. 2 is a diagrammatic view of the method of winding, showing how the coils are laid in the first layer.

This improvement is a conical ended bobbin, consisting of an advancing, conically wrapped layer of Universal winding, which species of winding is well understood by those versed in the art, but will be described. Universal winding consists in laying the yarn in openly coiled helices, each having a nominal number of turns per movement of the yarn depositing guide in one direction of its reciprocation. Thus, in the drawing, the yarn is shown as laid with five turns, or "winds", as they are technically known, a package being designated a "two-wind"—"five-wind" etc. package according as the yarn makes two or five etc. turns per traverse of the yarn depositing guide.

The term "nominal turns" is employed because the yarn actually makes a small fraction of a turn more or less than the nominal number, to secure the "gain", that is the peripheral change of turning point of the yarn at the end of each traverse, which causes each helix to be laid peripherally ahead of, or behind, the next preceding helix, to produce the close V wind that characterizes the "Universal" system.

In detail, the yarn depositing guide commences a traverse on a cone element indicated by *a*—*b*, see Fig. 2. The yarn is deposited by the guide in five turns (which return it peripherally to the element *a*—*b*) plus the small fraction of a turn *c*—*d* which carries it beyond the said cone element, to the turning point *e*. The reverse movement of the guide, (which is indicated diagramatically by the arrow *f*) turns the yarn at *e* and deposits it in a reverse helix, which in ten turns from the point of starting *a*, again crosses the cone element *a*—*b*, and at the end of a full reciprocation of the guide reaches its new starting point *g* which is peripherally away from the original starting point *a* to lay the next helix beside the first.

When the yarn has turned at *e*, and is guided back toward *a* in its return helix, it crosses over and binds down the first helix at each point of crossing *h i j* etc. This then, is a dominant characteristic of the "Universal" system, that each helix extends a sufficient distance in one direction so that it binds and holds the next preceding reverse helix and is bound and held by the reverse helix next succeeding. This is particularized because the extreme taper of the filling bobbins increases the tendency of each helix to slip, and renders a means for binding it especially needful.

The winding is started on the conically shaped core *m* and progresses until a deposit of definite thickness of material has been laid, which causes the said material to attain the diameter of the cop. Thereafter the guide is progressively shifted as to its path of traverse upon each reciprocation so that each turning point of bend, or "knuckle" as it is generally termed, is slightly advanced longitudinally of the cop with respect to the knuckle next preceding. Therefore in the completed cop the said knuckles show distinctly in a helical line extending along the surface of the cylindrical body. There is then, this novel feature about my new bobbin, that whereas, in the cylindrical cops of my Patent No. 486745, granted November 22d, 1892, the turning points of the yarn lie all in one plane, perpendicular to the axis of the cop and vary only peripherally; and whereas, in the conical cop of my Patent No. 607202, patented July 12th, 1898, they vary only peripherally in each layer and all lie in a frusto-conical surface; in my new cops, succeeding turning points vary both peripherally and longitudinally, which compounded variation causes the helical line *n* on the extreme outside diameter of the bobbin and permits the winding of the taper ended or taper nosed bobbin of my application.

What I claim, therefore, is

A cop having a cylindrical body and conical point and consisting of a series of reversed coils laid side by side to build the cop in a spiral conical layer wrapped upon itself, the rear edge of the layer forming a continuous spiral edge extending around the cylindrical portion of the cop.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SIMON W. WARDWELL.

Witnesses:

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