

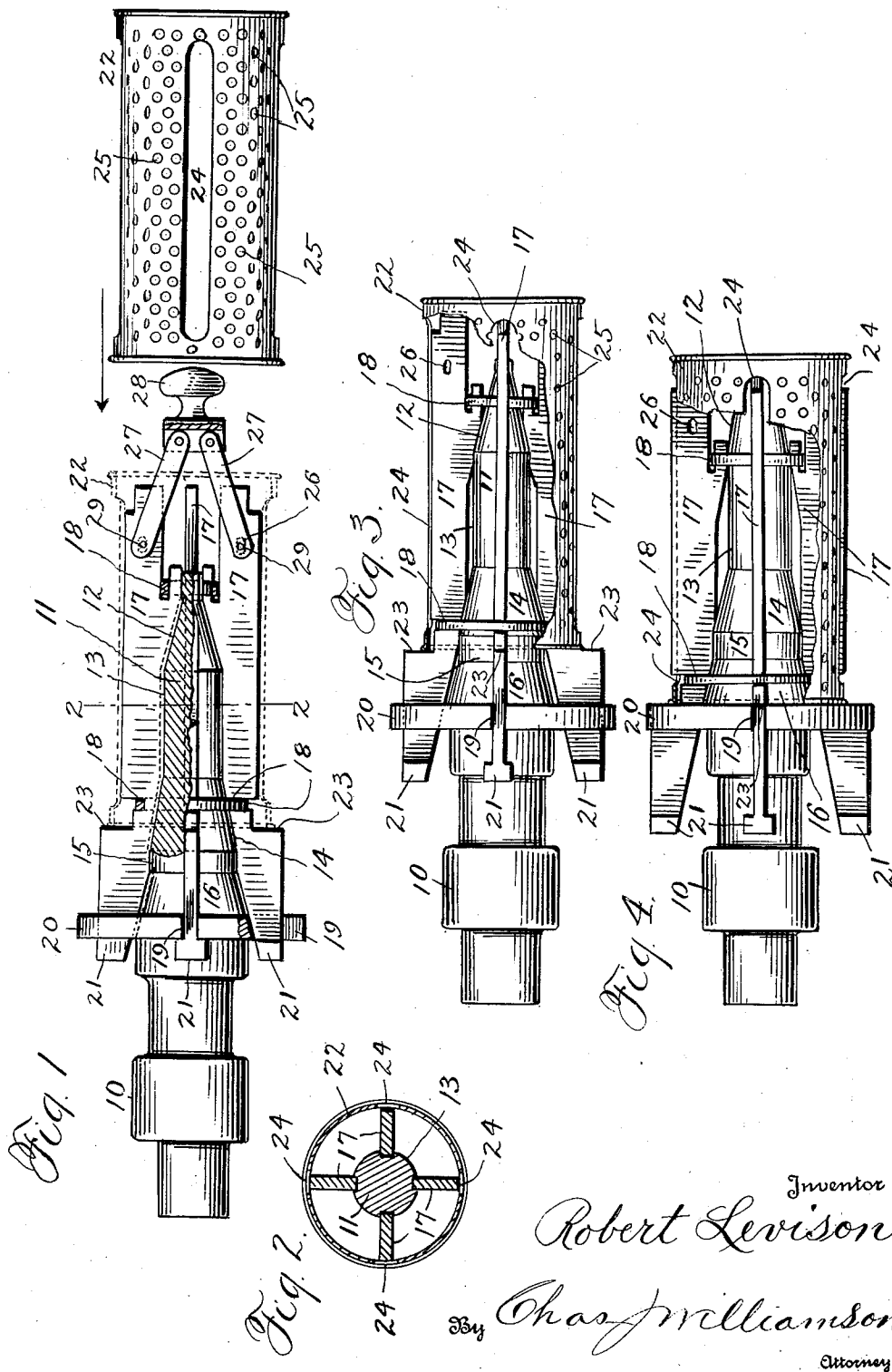
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SPOOL AND SPOOL HOLDER FOR THREADS, SUCH AS RAYON OR ARTIFICIAL SILK

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SPOOL AND SPOOL HOLDER FOR THREADS,
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My invention relates to spools upon which textile threads are wound and in particular to spools upon which are wound freshly spun artificial silk or rayon for the after handling of the threads such as in washing or other liquid treatments. My invention concerns that particular type of spool whose diameter may be changed so that it may be greatest at the time the threads are wound on the spool and thereafter reduced so that the coils will be slack or loose or shrunk on the spool. An object of my invention is to provide a construction which will be free from complicated parts so that at once its handling or manipulation may be convenient and easy or ready, thus saving time and achieving economy in that respect, economy of manufacture secured both by reason of the fewness of parts and their structural characteristics, and elimination of damage to the threads or yarn in the handling or manipulation of the spool when the threads are thereon.

Other objects and advantages of my invention will be understood by those skilled in the art from a consideration of the particular embodiment thereof shown in the drawing and described in detail hereinafter, which has been selected as a satisfactory exemplification of the invention.

The invention consists in whatever is described by or is included within the terms or scope of the appended claims.

Briefly described, my invention requires essentially but two members, one a simple hollow cylindrical spool body upon the periphery or exterior of which the threads or yarn, after winding are supported, and the other what for short, convenient description, may be called a holder, and which includes a shaft, or mandrel, and axially and radially movable blades, or thin bars, that are mounted upon the shaft or mandrel and over or upon which the cylindrical body, by a simple axial movement, may be placed, and which, by such axial movement in placing it thereon, automatically effects outward radial movement of the blades to cause their outer edges to protrude through slots or openings in the cylinder periphery. Besides the automatic radially outward movement of the blades from pushing the spool body thereover, the blades are automatically secured in their outer position with their edges protruding beyond the spool body periphery and thereby secured in position for and during the winding of the threads on the spool. The spool holder itself may be used with other forms, or types of spool bodies, than the simple hollow cylinder or tubular body mentioned, such for ex-

ample as spool bodies that are collapsible and expandible in diameter.

In the annexed drawing:

Fig. 1 is a side elevation with parts broken away and in section of the spool holder and spool shown separated with the radially movable blades of the holder in their contracted or radially innermost position, and showing in dotted lines the spool immediately after the spool has been shoved upon the spool holder to enclose or surround the blades;

Fig. 2 is a cross section on the line 2—2 of Fig. 1 the spool being shown in full lines;

Figs. 3 and 4 are, respectively, views similar to Fig. 1 and showing respectively the position of parts at an intermediate stage and the final stage of pushing axial movement of the spool, the parts in the final stage being ready for the winding of the threads on the device.

Describing in detail what is shown in the drawing, the shaft or mandrel at or near one end is formed for attachment or connection with a driving spindle of the spinning machine and such end having a hub or collar 10. Beyond the hub or collar 10, it is shaped to provide a forwardly tapering core 11, that terminates in a free cone shaped end 12, the cone widening from its top rearward and thus providing outwardly inclined cam surfaces. From the larger end of the coned tip 12, the core, 11, has a cylindrical portion 13, that provides exterior surfaces that are parallel with the core axis and from the inner end of such cylindrical portion there extends a second cone 14, whose larger end is away from the cylindrical portion 13, and thus provides external surfaces on the core that incline outward in the direction away from the cylindrical portion 13. Adjoining the cone 14 is a short cylindrical portion 15 that provides external surfaces parallel with the core axis and beyond such cylindrical surface 15, there is a third cone 16, that provides inclined surfaces at the end of the core opposite the tip. It will thus be seen that there is a succession of conical or inclined external surfaces and cylindrical or non-inclined external surfaces on the core and with such surfaces are adapted to contact corresponding inclined and non-inclined surfaces on the inner edge of each of a circular series of axially extending blades or thin bars 17, spaced equi-distant around the core and attached thereto so that they may be moved longitudinally or axially of the core. By inward endwise movement of the blades or bars along the core contact with the inclined surfaces thereof will gently but quickly move the blades radially outward

to the stage shown in Fig. 3 and finally non-inclined surfaces of the core and of the blade edges being brought into contact as shown in Fig. 4, the blades will be retained or secured in the final position shown in Fig. 4, for the winding or wrapping of the threads or yarn. As there are two widely separated non-inclined contacting surfaces which are, respectively, towards the ends of the blades, the blades will be steadily supported in their radially outward position parallel with the mandrel axis. Each blade is slidably seated in a shallow longitudinal groove in the core.

At suitable points along their length, the blades are engaged by devices that tend normally to move the blades radially inward which devices for example may be rings or bands 18, of rubber or elastic which encircle the blades and which readily yield to outward pressure upon the blades by the action of the inclined surfaces when the blades are to be moved radially outward.

At their inner ends, the blades are supported and guided in their radial movements by a radial slot 19 for each blade in a flange or collar 20, on the mandrel, at the inner end of the core through which the inner end of the blade passes and on the rear or far side of said collar adjacent the slot, each blade has a lateral enlargement or head 21, that encounters the adjacent side of the flange or collar 20, to limit the axial outward movement along the core of the blades in their contracting movement.

Each blade has at a point distant from its outer end substantially equal to the length of the spool body 22, a radially extending shoulder 23, that provides an abrupt bearing surface adapted for engagement by the inner end of the spool 22, when applied to the holder as shown in Fig. 1, by being pushed thereon and by a simple pushing movement of the spool 22, the axial movement of the blades over the core and the outward radial movement of the blades from the core is effected, as illustrated in Figs. 3 and 4, and on the completion of such axial movement the automatic locking or securing of the blades in their outward position against the inward pull or contracting action of the rubber rings 18, is effected by the contact therewith of the non-inclined surfaces of the core, as before explained.

For the protrusion, as shown in Fig. 4, of the outer straight edges of the blades (which are parallel with the mandrel axis), the desired distance beyond the outer periphery of the spool 22, the latter has for each blade a longitudinally extending slot, 24. Such slots provide for the free access of washing or other treating fluids to the yarn and in some cases, it is desirable to provide holes or perforations 25, in the spool wall for the passage or flow of such fluids.

Radially inward movement of the blades to disengage them from the spool slots and allow the spool to be readily removed with the relaxed or shrunken yarn coils on the spool is accomplished by a simple outward axial movement of the blades that will free the contacting non-inclined surfaces of core and blades. For this purpose, a hole or perforation 26, may be provided near the outer end of each blade for engagement by a readily applied hook of a simple pulling device. As shown in the drawing, Fig. 1, such a device may consist of a pair of arms, 27, pivoted at one end to a knob or handle 28, and at the other end having a hook or pin 29, to engage a blade hole. Such a withdrawal device may easily be applied and removed.

The spool body may be satisfactorily and inexpensively made of thin sheet metal both lacquered and unlacquered and of other appropriate material. Where strengthening of thin material is required, it may be done by beads or ribs at the ends and by longitudinally extending ribs that extend parallel with the spool axis and which, of course, project inward from the exterior surface so that they will not interfere with the threads or yarn wrapped on the spool.

The spool holder can be made in whole or in part of such materials as non-corrosive metals, hard rubber, porcelain, earthenware, aluminum and magnesium compositions, etc. The materials used must be such as to resist or withstand corrosive or disintegrating action of liquids with which they have contact in the spinning and after operations or treatments, these after treatments being such as washing, desulphidizing, bleaching, dyeing, sizing, etc. My spool holder and spool not only do not interfere with any of these procedures, but they promote them. And this is true whether the liquid is sucked or pressed through the yarn on the spool or they are sprayed or dripped. In a spraying or dripping treatment the spool perforations in addition to the slots need not be provided.

What I claim is:

1. Means for winding and supporting textile threads after winding comprising a hollow cylindrical spool with longitudinally extending slots in its circumference and a holder having thread engaging members movable through such slots between positions outside and inside the circumference of the spool and spool engageable means acting on said members by movement of the spool in an axial direction, said spool being movable axially.

2. Means for winding and supporting textile threads after winding comprising a hollow cylindrical spool with longitudinally extending slots in its circumference and a holder having thread engaging members movable through such slots between positions outside and inside the circumference of the spool and spool engageable means acting on said members by movement of the spool in an axial direction, said spool being movable axially, said spool engageable means including spool end engaging bearings on said members.

3. A spool holder comprising a mandrel, blades spaced around the mandrel and extending axially thereof and movable radially, blades and mandrel having co-acting surfaces that effect radial movement, means on the blades coacting with a spool endwise movable thereover that move the blades axially to effect relative movement of said co-acting surfaces of blades and mandrel and means attaching the blades to the mandrel that allow blade movement.

4. A spool holder comprising a mandrel, blades spaced around the mandrel and extending axially thereof and movable longitudinally and radially, blades and mandrel having co-acting surfaces that effect radial movement, means attaching the blades to the mandrel that allow blade movement and comprising a collar on the mandrel with radial guide slots through which portions of the blades pass, the blades having stops to abut against a side of the collar that limit longitudinal movement of the blades.

5. Means for winding and supporting textile threads after winding comprising a hollow cylindrical spool with longitudinally extending slots in its circumference, a holder having thread engaging members movable through such slots be-

tween positions outside and inside the circumference of the spool, spool engageable means acting on said members by movement of the spool in an axial direction, said spool being movable axially, means to retain such members in their projecting position, means to move such members to release the spool comprising a pair of arms and a handle to which both are pivoted.

5 6. A spool holder comprising a mandrel and a series of thread-engaging members extending longitudinally of the mandrel, means movably connecting such members with the mandrel that allow movement thereof radially of the mandrel, in combination with a cylindrical spool surrounding the mandrel and having openings through which said members may move radially, said spool being endwise movable over the mandrel for application thereto and removal therefrom.

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