





# UNITED STATES PATENT OFFICE

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## BOBBIN HOLDER FOR LOOPING MACHINES

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3 Claims. (Cl. 112—25)

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This invention relates to thread release and tensioning devices for textile machines, and more particularly to a thread unreeling and tensioning device for a hosiery looping machine.

In textile machines now in use for looping the toe seams of hosiery, and for similar purposes, the thread spools or bobbins are stationarily mounted on a carrier and the thread is pulled off of these bobbins or spools as it is used by the machine. This pulling of the thread off of such a stationary bobbin or spool puts an extra twist in the thread beyond that imparted in the thread-spinning operations and this additional twist causes the thread to kink and knot in the machine, resulting in uneven stitches or loops and frequent breakage of the thread.

This method of feeding the thread also produces uneven tension which causes the thread to pull and sliver, and results in an imperfect product. Also, the single-tensioning unit employed in machines now in use has no effect in reducing the fluctuations in the thread tension and has a tendency to aggravate the kinking and knotting condition caused by over-twisting the thread.

It is among the objects of the present invention to provide an improved spool or bobbin carrier having means for turning the spools or bobbins as the thread is removed or unwound therefrom to eliminate any extra twist in the thread incident to the unwinding or unreeling operation, and to also reduce or eliminate any tension in the thread as it leaves the spool or bobbin and thereby eliminate variations in the thread tension, which provides a plurality of thread-tensioning devices which operate together to apply the proper tension to the thread, but individually resist movement of the thread to an extent that causes no material pulling, stretching, twisting or breaking of the thread, which can be applied to an existing hosiery-looping machine without material modification of the machine construction, and does not interfere in any way with the normal operation of the machine, and which is simple and durable in construction, and economical to manufacture.

Other objects and advantages will become apparent from a consideration of the following description and the appended claims in conjunction with the accompanying drawings, wherein:

Figure 1 is a side elevation of a fragmentary portion of a hosiery-looping machine showing the application thereto of a thread bobbin carrier, illustrative of the invention;

Figure 2 is a top plan view of the machine fragment and thread bobbin carrier illustrated in Figure 1;

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Figure 3 is a cross-sectional view on the line 3—3 of Figure 1;

Figure 4 is a cross-section on the line 4—4 of Figure 1; and

Figure 5 is a cross-section on the line 5—5 of Figure 2.

With continued reference to the drawings, the numeral 10 indicates the arm of a known form of hosiery knitting machine. This arm is right-angular in shape and includes a substantially vertical trunk portion 11, an extended base 12 on the bottom end of the trunk portion for attaching the machine to a support, such as a table 13, and a boom portion 14 projecting outwardly from the upper end of the trunk portion 11 and substantially horizontally disposed. The machine is driven by a shaft 15 having thereon a belt pulley 16 and a hand crank 17 for manually setting the machine. The shaft 15 is driven from a main shaft 18 journaled in the trunk 11 of the machine arm through a worm gear 19 mounted on the shaft 15, and a worm 20 mounted on the main shaft 18. The main shaft may be driven by a suitable power plant, such as an electric motor.

As the hosiery-looping machine is of known construction and constitutes no part of the present invention, except in the combination thereof with the improved thread release or bobbin carrier, it is considered unnecessary to further illustrate or describe this machine.

The thread carrier comprises an upright stand 21 having on its lower end an extended base 22 for attachment to the table or support 13 upon which the machine is mounted, and this stand carries on its upper end an elongated platform, generally indicated at 23.

The platform 23 comprises a substantially horizontal bottom rail 24 secured at its mid-length location to the upper end of the stand 21, an upper rail 25 spaced above and substantially parallel to and coterminous with the lower rail 24, and two substantially vertical struts 26 and 27 extending between the lower and upper rails 24 and 25 near respectively-opposite ends of the rails.

The rails 24 and 25 are provided, near their respectively-opposite ends, with vertically-registering apertures, and two upright spindles 28 and 29 are journaled in the platform rails at respectively-opposite ends of the platform. A circular plate or disc 30 is secured on the spindle 28 immediately above the top rail 25 of the platform, and a bobbin holder 31, Figure 4, extends above the plate 30 to receive a thread spool or bobbin 32.

A plate or disc 33, similar to the plate or disc

30 is mounted on the spindle 29 immediately above the platform upper rail 25, and a projection, not illustrated, extends upwardly from this plate to receive a thread spool or bobbin 34. A post 35 extends upwardly from the mid-length location of the platform top rail 25, and a bar 36 is secured at its mid-length location to the top of post 35 and extends laterally above the two bobbins 32 and 34. Near its opposite ends the bar 36 is provided with thread-guide apertures 37 and 38 through which the threads from the two bobbins are led to the machine.

Two thread bobbins are used, so that, when one bobbin is depleted the thread of the reserve bobbin may be connected to the thread of the depleted bobbin and operation of the machine maintained without substantial interruption.

A bearing block 40 is secured to one end of the base 22 in position to rest upon the table or support 13, and an upright arbor 41 is journaled in this bearing. The upper end of the arbor 41 is provided with a bore which receives the lower end of spindle 29 and with notches at opposite sides thereof which receive a pin 42 extending transversely through the spindle 29 near its lower end, the notches and the pin 42 providing a longitudinally-separable driving connection between the arbor 41 and the spindle 29.

A worm gear 43 is secured on the arbor 41, and a worm 44 is secured on the main shaft 18 and meshes with the worm gear 43. In providing the improved thread release of the invention, the existing main shaft 18 of the machine is removed and a somewhat longer main shaft is substituted therefor, so that the substituted main shaft will extend from the worm 20 to the worm 44 in addition to the extent of the original main shaft.

With this construction, when the looping machine is in operation, the spindle 29 will be rotated at a speed proportional to the operating speed of the looping machine.

A jack shaft 45 extends through the platform between the upper and lower rails 24 and 25, and is journaled near its opposite ends in the struts 26 and 27, respectively. A beveled gear 46 is mounted on the shaft 45 at the end thereof adjacent the spindle 29, and a beveled gear 47 secured on the spindle 29 meshes with and drives the gear 46. A second beveled gear 48 is secured on shaft 45 at the opposite end of the shaft and a beveled gear 49 is secured on spindle 28 and meshes with gear 48 to drive the spindle when the shaft 45 is rotated.

The gears 46, 47, 48 and 49 are of such relative sizes that the two spindles 28 and 29 are driven at substantially the same speed while the worm gear 43 and worm 44 are of such ratio that the spindles are driven at a speed having a predetermined ratio to the operating speed of the textile machine.

A lug 51 projects from the platform rail 24 and a headed pin 52 is secured to this lug at one side thereof. A link 53 has, near one end, an elongated slot 54 receiving the pin 52 and is pivotally secured at its opposite end to the adjoining end of a second link 55. The opposite end of the second link is pivotally secured to the machine arm 10 at a location adjacent the original thread-tensioning device 56 of the machine.

Two additional thread-tensioning devices 57 and 58 are carried by the link 55 and the thread fed to the machine is led through all three of the tensioning devices 56, 57 and 58. The pressure on all of the thread-tensioning devices is

adjusted, so that all three devices provide substantially the same tension originally provided by the single device 56, and the pressure applied to the thread is thus greatly reduced.

In the operation of the machine, the thread bobbins are turned in a direction to unwind the threads therefrom, so that the thread is loose between the bobbin in use and the first or nearest tensioning device 58. As there is no tension on the thread as it leaves the bobbin, the thread tension will not be varied by the variable resistances encountered in pulling the thread off of a stationary spool or bobbin. No extra twist will thus be given to the thread, and the thread will not be jerked and pulled in a manner to cause it to kink or knot. By reducing the tensioning device pressure on the thread, the tendency of such devices to cause pulling, slivering and twisting of the thread is also minimized and practically eliminated.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are, therefore, intended to be embraced therein.

What is claimed is:

1. In combination with a support, a looping machine including an arm mounted at one end on said support and adapted to carry looping mechanism at the other end thereof and a drive shaft extending along said arm for driving the associated mechanism, and a bobbin carrier comprising an upright stand mounted on said support adjacent said one end of said arm and having a substantially horizontally disposed platform at its upper end, a bobbin spindle journaled in upright position in said platform and extending thereabove to receive a thread bobbin, a bearing carried by said stand below said platform, an arbor journaled in said bearing and drivingly connected at its upper end to the lower end of said spindle, a worm gear on said arbor, and a worm on said drive shaft meshing with said worm gear to drive said spindle at a speed proportional to the operating speed of the associated looping machine.

2. In combination with a support, a looping machine including an arm mounted at one end on said support and adapted to carry looping mechanism at the other end thereof and a drive shaft extending along said arm for driving the associated mechanism, and a bobbin carrier comprising an upright stand mounted on said support adjacent said one end of said arm and having a substantially horizontally disposed platform at its upper end, bobbin spindles journaled in upright position in said platform in spaced apart relationship to each other, a bearing on said stand below said platform, an arbor journaled in said bearing and drivingly connected at its upper end to the lower end of one of said spindles, means carried by said platform drivingly connecting said one spindle to the other of said spindles for rotation of said spindles in the same direction at substantially the same speed, a worm gear on said arbor, and a worm on said drive shaft meshing with said worm gear for driving said spindles at a speed proportional to the speed of the associated looping machine.

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3. In combination with a support, a looping machine including an arm mounted at one end on said support and adapted to carry looping mechanism at the other end thereof and a drive shaft extending along said arm for driving the associated mechanism, and a bobbin carrier comprising an upright stand mounted on said support adjacent said one end of said arm and having a substantially horizontally disposed platform at its upper end, bobbin spindles journaled in upright position in said platform in spaced apart relationship to each other, a bearing on said stand below said platform, an arbor journaled in said bearing and drivingly connected at its upper end to the lower end of one of said spindles, means carried by said platform drivingly connecting said one spindle to the other of said spindles for rotation of said spindles in the same direction at substantially the same speed, a worm gear on said arbor, a worm on said drive shaft meshing with said worm gear for driving said spindles at a speed proportional to the speed of the associated looping machine, a bar supported at one end by said stand and supported at its other end

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on said arm so that it is upwardly inclined from said arm toward said platform, and a plurality of thread-tensioning devices mounted on said arm in spaced apart relationship to each other for receiving a thread from a spindle-supported bobbin and acting in tandem on the thread to apply tension thereto.

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## REFERENCES CITED

The following references are of record in the file of this patent:

## UNITED STATES PATENTS

Number	Name	Date
79,297	Atherton	June 30, 1868
724,776	Banks	Apr. 7, 1903
809,855	Starr et al.	Jan. 9, 1906
900,155	Eastwood et al.	Oct. 6, 1908
1,513,403	Lebels	Oct. 28, 1924
2,370,922	Siegenthaler	Mar. 6, 1945
2,391,957	Fenner et al.	Jan. 1, 1946
2,438,034	Brugger	Mar. 16, 1948