

P. H. DONNELLY.
TENSION CONTROLLING MEANS FOR SPOOLERS.
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Fig. 1.

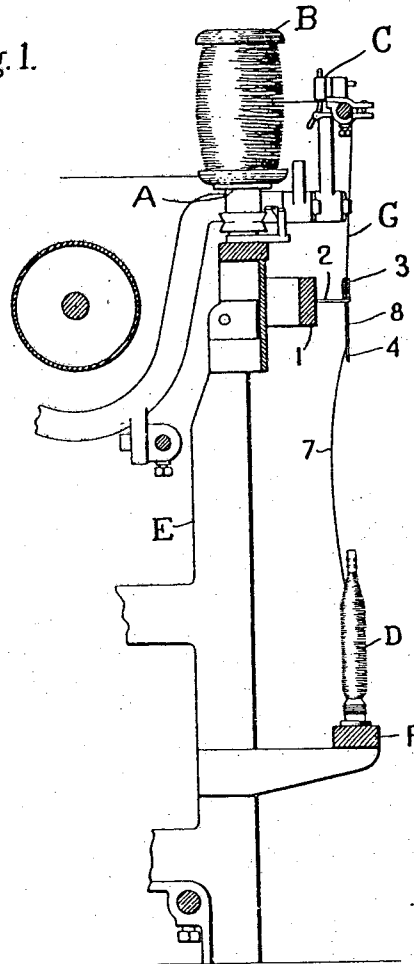
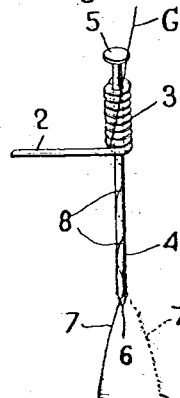


Fig. 2.



Witnesses.

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TENSION-CONTROLLING MEANS FOR SPOOLERS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PETER H. DONNELLY, a citizen of the United States, and resident of New Bedford, county of Bristol, State of Massachusetts, have invented an Improvement in Tension-Controlling Means for Spoolers, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates more particularly to apparatus for spooling yarn or thread, wherein the yarn is spooled from filling-wound cops or bobbins and hence is drawn off the tip thereof, and the principal object of the invention is the production of means to control the tension of the yarn as it passes from the yarn mass to the spool.

In spoolers of this type it is customary to run the yarn over a technically termed "friction roll", about two inches in diameter, and covered with felt, to impart tension or drag upon the yarn. The yarn cuts into the felt after a time and then the roll is partially revolved to expose a fresh portion of the felt. Ultimately the friction covering has to be replaced, involving considerable expense and trouble, and the present invention provides a novel and effective friction control for the yarn which acts automatically and practically takes care of the varying pull of the yarn during the spooling operation.

The novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a transverse sectional view of a sufficient portion of a spooler in which the yarn is drawn off a filling-wound cop or bobbin, with tension controlling means embodied therein showing one practical form of my invention; Fig. 2 is an enlarged perspective detail of the tension controlling means, to more clearly illustrate the operation thereof.

Referring to Fig. 1, the rotatable spindle or carrier A for the spool B, the reciprocating guide C to traverse the thread or yarn upon the spool, and the cop or bobbin D having the yarn laid thereon with the filling

wind, may be and are all of well known construction, the yarn being drawn off the upper end or tip of the bobbin as it passes to the spool.

It will be understood that as usual a series of spool-carriers and spools are mounted on each side of the main frame E, and a rail F is in practice provided with suitable upright supporting means, for the bobbins D.

Instead of the friction roll heretofore referred to I interpose my novel tension controlling means between the spools and the supply bobbins, each yarn or thread G having its own controlling means.

Below the series of spools a horizontal rail 1 is fixedly attached to the main frame, and said rail sustains a series of supports, each comprising a horizontal stem 2 and an upright tubular portion 3.

Herein I have shown the support as made of wire, and coiled closely upon itself to form the tubular portion 3, and in practice each of such portions is located above and in vertical alinement with the yarn supply cop or bobbin D.

The member of the controlling means which coöperates with the yarn is made of metal and consists of an elongated smooth shank 4 of such a diameter that it will slide freely in the support, the shank having a head 5 at its upper end, and its lower end is preferably tapered or pointed, as at 6, Fig. 2. The head prevents the controlling member from dropping out of its support, and it will be seen that the shank 4 extends a considerable distance below the tubular part 3 of the support. The yarn G is led upward and passed partly around the tubular portion 3 and thence is carried to the traversing guide C, as shown. When the spool B is revolved the yarn is pulled upward and as it draws off from the bobbin D it is given a whirling motion, as indicated by full and dotted lines 7, Fig. 2, between the bobbin and the controlling means. As the yarn thus whirls it wraps itself around the depending end of the controlling member 4, two, three or more wraps being formed, as at 8, Fig. 2, and the friction generated by the yarn as it

travels around the said member exerts a tension or drag upon the yarn as it passes to the spool. When a sufficient number of wraps encircle the controlling member the tension increases until the friction is sufficient to lift the controlling member, and when it is lifted one or more of the wraps will be discharged from the lower end of the said member.

10 In Fig. 1 the member 4 is shown in its lowest position, before any lifting action has occurred, but in Fig. 2 I have shown said member lifted somewhat. Now when one or more of the wraps are thrown off or discharged the friction is reduced and consequently the tension is decreased, and the weight of the controlling member causes it to descend more or less, until another wrap, or several wraps, will be again formed around the member, again causing it to be lifted. The rising and falling of the controlling member thus serves to establish a species of equilibrium, so that as the tension varies above or below the normal the tendency of the controlling member is to reduce or increase, respectively, the tension by a reduction or increase of the frictional action of the yarn upon such member. The pull of the yarn varies during the spooling operation and the tension controlling means herein described takes care of such variations automatically and in a very efficient manner, so that a very uniform tension is exerted upon the yarn throughout the operation. In ordinary cases the number of wraps of yarn may reach a maximum of three, while a single wrap is the minimum, the whirling of the yarn always tending to wrap itself about the depending end of the vertically movable controlling member, as will be manifest.

It will be understood that the greater the number of wraps the greater will be the friction and the greater the tension or drag, and vice versa, so that the controlling means is practically automatic in adapting itself to varying conditions of the yarn.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a spooler, tension controlling means interposed between the rotating spool and the upright carrier from which the yarn is drawn, said means comprising an elongated gravity controller located axially above the carrier, for the whirling yarn to wrap around on its way to the spool, and a fixed tubular support for the upper end of and in which the controller is movable vertically, the tension exerted upon the yarn by frictional engagement of the yarn wraps with the controller causing the latter to rise and fall in its support as the tension rises and falls below normal, whereby the number of wraps on the controller will be de-

creased or increased, respectively, and the tension modified correspondingly.

2. In a spooler wherein the yarn spooled is drawn off the end of an upright cop or bobbin, tension controlling means for the yarn, comprising an upright, longitudinally movable controller in the path of and around which the yarn wraps on its way to the spool, and a fixed support for and below which the controller extends to receive the yarn wraps, increase of tension due to frictional engagement of the wrapped yarn with the controller moving the latter longitudinally to discharge one or more wraps and thereby diminish the friction, a diminution of the tension permitting the controller to descend and receive an additional wrapping of yarn.

3. In a spooler wherein the yarn spooled is drawn off the end of an upright filling-wound yarn mass, tension controlling means for the yarn comprising a metal controller having an elongated, smooth and headed shank located above and co-axial with the yarn mass, to receive one or more wraps as the yarn passes to the spool, and a tubular, fixed support for the controller and below which the latter extends to be engaged frictionally by the enwrapping yarn, the tension varying with the number of wraps, increased tension acting to lift the controller and discharge one or more wraps therefrom while the controller descends by gravity to receive additional wrapping when the tension decreases, the head of the controller limiting its descent and retaining it in the support.

4. In a spooler wherein the yarn spooled is drawn off the end of a cop or bobbin, automatic, frictionally-governed tension controlling means for the yarn, comprising a member located in the path of the yarn to the spool and movable by gravity and by frictional engagement with the yarn, respectively, into position to increase or decrease such engagement and thereby correspondingly increase or decrease the tension exerted by said member upon the yarn, and a fixed support for and in which said member is freely movable longitudinally.

5. In a yarn winding machine the combination of a longitudinally movable tension member and means for maintaining said member with its surface in helical engagement with the yarn, the varying decrease or increase of tension of the yarn causing the tension member to move longitudinally and present a correspondingly greater or less portion of its surface to engagement with the yarn, thus to counteract the variation in tension by a variation in extent of the surface of the tension member in engagement with the yarn.

6. In a yarn winding machine the combination of a longitudinally movable tension

member and means for supporting said member to allow gravity to present a greater or less helical line of its surface in engagement with the yarn accordingly as the tension in the yarn decreases or increases, and
5 thus to cause the variation in friction to compensate the variation in tension.

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

PETER H. DONNELLY.

Witnesses:

GEORGE N. GARDINER,
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."