(No Model.)

C. MIEHLING.

TENSION DEVICE FOR SEWING MACHINES.

No. 302,925. Patented Aug. 5, 1884.

Fig. 1.

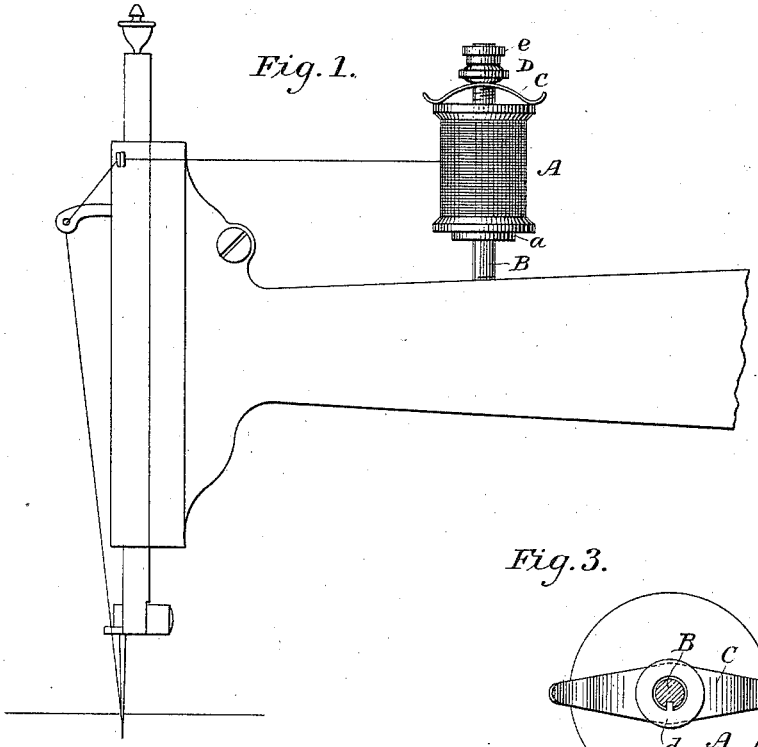


Fig. 3.

Fig. 4.

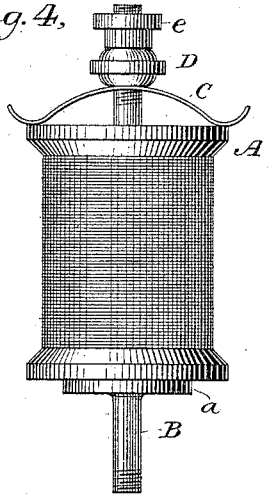
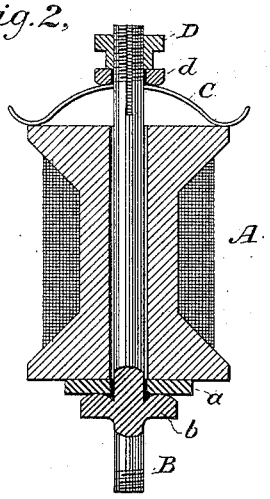


Fig. 2.



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TENSION DEVICE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 302,925, dated August 5, 1884.

Application filed February 9, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES MIEHLING, a citizen of the United States, residing in the city of New York, in the county and State of New York, have invented a certain new and useful Improvement in Tension Devices for Sewing-Machines, of which I declare the following to be a full, clear, and exact description, so that any person skilled in the art or science to which it appertains can make, construct, and use the same, reference being had to the accompanying drawings, which form part of this specification, and to the letters and figures of reference thereon.

The invention relates to the means of giving tension to the thread of a sewing-machine, or generally to thread or yarn of any kind that is being unwound from a spool. Its object is to avoid the crushing and injuring of the thread incidental to the use of tension devices where the thread passes between compressing surfaces, and to provide a cheap and simple tension readily applied and manipulated.

It consists in the devices hereinafter described and claimed.

The accompanying drawings represent my invention as applied to a sewing-machine.

Figure 1 is a side view of the device applied to the needle-arm of a sewing-machine. Fig. 4 is an enlarged view of the device itself. Fig. 2 is a section, and Fig. 3 a detail view, of a preferred form.

The spool A is carried on the usual fixed spindle, B, which I preferably make a snug fit for the bore of the spool, just so that the spool will revolve steadily on the spindle with little friction. The supporting-plate *a*, on which the spool sits, may be made integral with the spindle, as shown in Figs. 1 and 4, or it may, as is shown in Fig. 2, be made of a separate piece and free to revolve on the spindle B, in which case it would rest upon a collar, *b*, of the spindle, and would revolve with the spool, the friction caused by such revolution of the spool taking place between the loose plate *a* and the collar *b*. In this latter case I preferably make the under surface of the plate *a* flat and smooth, and the upper surface of the collar *b* convex in section, so that the contact between the plate and the collar may be in a circle concentric with the section of revolution of the plate. Thus the utmost uniformity of friction is attained. The spindle B is embraced at its upper end by a spring, C, which has a hole cut through it that fits loosely over the shank of the spindle, whereby the spring C is free to move up and down on the spindle and to revolve about it without appreciable friction. This spring C has arms, as shown, which, when the center of the spring is forced down, press against the head of the spool A, whereby the spring C revolves with the spool. Any mode of connecting the spring and the spool may be employed, such that the spring revolves with the spool whenever the latter revolves. The form of spring shown in the drawings is adapted to accomplish the object fully, and is the simplest form of the device I have contrived, and is suited to any size of spool. The center of this spring is forced down by a friction-piece on the spindle B, whose under surface comes in contact with the upper surface of the spring C. This friction-piece is not capable of revolution on the spindle B when the device is in operation, but is adjustable as to its up and down position on the spindle, and therefore as to the degree of pressure which it exerts upon the center of the spring C. Thus there is a frictional contact between the spring C and this friction-piece which is adjustable, and which tends to retard the revolution of the spring C, and consequently of the spool A. To secure the utmost regularity of friction between these two surfaces I prefer to make the spring C of steel, and its upper surface flat or slightly convex and perfectly smooth, and the friction-piece of brass, and its under surface convex in section, as shown in the drawings, whereby the contact is in a circle concentric with the section of revolution of the spring C. Thus the revolution of the spool A and spring C are evenly and smoothly retarded to a degree depending upon the frictional pressure the friction-piece exerts upon the spring C, which is determined by the vertical adjustment of the friction-piece on the shank of the spindle B. This vertical adjustment I prefer to regulate in the manner shown in Figs. 2 and 3, where the friction-piece bearing down on the spring C

is a collar, *d*, encircling the spindle and having a lug capable of working up and down in a vertical slot in the spindle, as shown, whereby the collar *d* is capable of motion up and down on the spindle B, but is incapable of revolution about the spindle. Its vertical position up and down on the spindle is determined by the thumb-screw, or "tension-screw" D, as it may be called, which screws up and down in a screw-thread cut in the spindle B. However, the friction-piece bearing down on the spring C may be at once the tension-screw D itself, as shown in Figs. 1 and 4, in which case it would be preferable to employ the usual jam-nut, *e*, as shown in those figures, or to slot the screw part of the spindle B entirely through, and make the tension-screw very tight, for the purpose of preventing the tension-screw D gradually working round with the spring C in the latter's revolution in use, and thereby disturbing the tension.

My improvement enables me to use horizontal spindles B, as well as vertical spindles, for carrying the spool, for the spool is held securely in place on the spindle by the tension device. This is useful in some instances where the spool is being used to wind bobbins.

My improved tension device, being simple and easily applied, may be used with automotic bobbin-winding attachments. In such case I prefer to have two spindles B and two independent tension devices on the machine—one to regulate the tension of the sewing-thread—and the other to regulate the tension of the bobbin-winding thread the sewing and the bobbin-winding being thus simultaneously carried on.

It is a peculiarity of my improved tension device that the screwing down of the tension-screw D regularly and progressively tightens the tension on the thread until the spool is finally stopped altogether.

I am aware that fixed bowed springs have been used as cushions for spools to revolve upon with adjustable pressure, that spools have been held on conical bearings entering the bore of the spool and pressing against the interior of the bore with a spring-pressure, and that spring-brakes have been applied to the spindles on which the spools were secured. I do not claim any of these arrangements. My arrangement of spring revolving with the spool, bowing outward and bearing near its center upon an adjustably-fixed friction-piece, obviates difficulties inherent in all the prior devices.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the spool A, the spindle B, and the bowed spring C, having frictional engagement with the spool, with an adjustable friction-piece bearing upon the spring, whereby the rotation of the spool is adjustably retarded, substantially as and for the purposes set forth.

2. The combination of the spool A, the spindle B, having collar *b* and the plate *a*, and bowed spring C, both having frictional engagement with the spool, with an adjustable friction-piece bearing upon the spring, whereby the rotation of the spool is adjustably retarded, substantially as and for the purposes set forth.

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