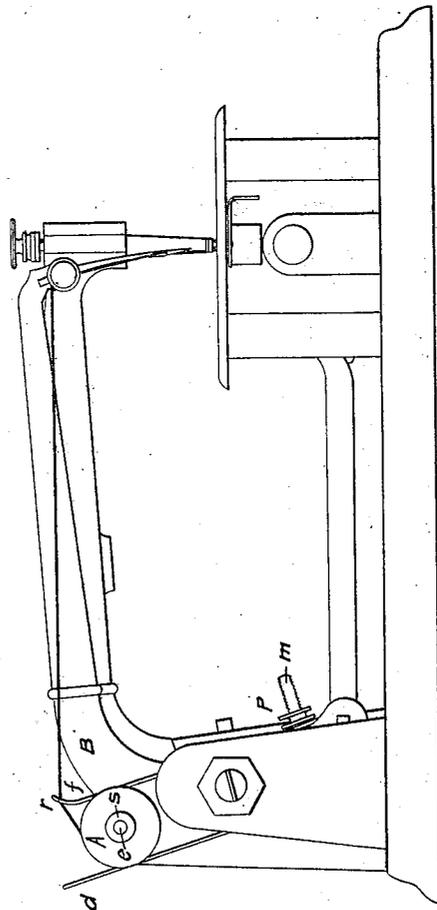
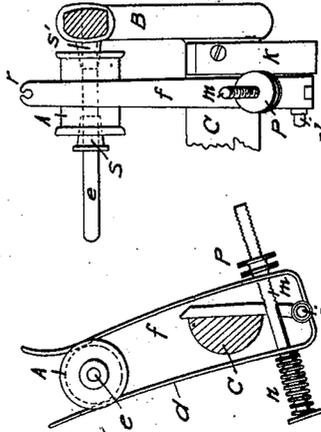


S. LARKIN.  
SEWING MACHINE THREAD TENSION.

No. 18,072.

Patented Aug. 25, 1857.



# UNITED STATES PATENT OFFICE.

SAMUEL LARKIN, OF BRIDGEPORT, CONN., ASSIGNOR TO THE WHEELER & WILSON MANUFACTURING COMPANY, OF SAME PLACE.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 18,072, dated August 25, 1857.

### *To all whom it may concern:*

Be it known that I, SAMUEL LARKIN, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented a new and useful Improvement in Sewing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of my improvement applied to a Wheeler & Wilson sewing-machine. Fig. 2 is a section of the rock-shaft of the needle-arm with my improvement applied thereto, and Fig. 3 is a face view of the same.

My improvement has reference to the apparatus by which the tension of the thread in a sewing-machine is effected and regulated. In the operation of sewing by machinery it is of great importance that the tension of the thread should be equable, and that there should at the same time be some convenient means by which this tension may be varied or adjusted to suit the quality of the work and the size of thread. As the sewing proceeds and thread is drawn off from the spool the diameter of the mass of thread remaining upon the latter becomes progressively less, and if the tension be created by causing a frictional resistance between the spool and its spindle the effective tension or strain upon the thread becomes progressively greater as the diameter of the mass of thread becomes less, because the available lever by which the strain upon the thread overcomes the frictional resistance is the radius of the mass of thread upon the spool or half its diameter.

The object of my invention is to furnish a convenient means for effecting and regulating the tension of the thread in such manner that when it has been adjusted for any particular spool of thread it will remain practically the same until the whole spool is exhausted; and my invention consists in combining with a spool-spindle or other means of supporting a spool of thread a pair of adjustable spring-forceps whose jaws embrace and bear upon the surface of the thread, and which are constructed in such manner that a considerable movement of the jaws toward or from each other may be effected with an inappreciable change in the tension of the spring which draws the jaws together.

In the mode of constructing and applying

my invention, which is shown in the accompanying drawings, the spool of thread A is supported upon a horizontal spindle, *e*, secured to the needle-arm B at a short distance above the rock-shaft C, by which the needle-arm is caused to vibrate. The spring-forceps is secured to the rock-shaft C. It consists of two members or reins, *d* and *f*, which are hinged at their lower extremities to a pivot, *i*, and whose upper extremities or jaws bear upon the opposite sides of the mass of thread wound upon the spool. The pivot *i* is secured by a bracket, *k*, to the rock-shaft of the needle arm, and the lower extremities of the forcep-reins are constructed to turn freely upon it. The lower extremities of the reins are perforated to admit a bolt, *m*, which passes transversely through them, and sustains the spring *n*, which in this instance is coiled upon the stem of the bolt, between its head and the face of the adjacent rein *d*. The tension of the spring is adjusted by means of a milled nut, P, which is screwed upon the bolt and bears against the other rein, *f*, of the forceps. The upper extremity of the jaw of the forceps which is nearer the needle is pierced with an open eye, *r*, through which the thread from the spool is passed, and by which it is guided in its passage toward the needle. The spool-spindle is sufficiently small to pass through the tube of the smallest spools which are used. The tubes of large spools would therefore fit loosely upon it, and would not present themselves fairly to the jaws of the forceps. In order to obviate any difficulty which may arise from this cause, I have fitted two conical thimbles, *s s'*, to the spool-spindle, so as to be entered into the opposite extremities of the spool-tubes and fill up the void space around the spindle, thus adapting the tubes to the spindle and preventing any injurious play.

When a spool of thread is to be applied to a sewing-machine fitted with this apparatus, the outermost thimble, *s*, is withdrawn from the spool-spindle *e*. The jaws of the forceps are then separated by hand, the spool is applied to the spindle, and the jaws are permitted to close upon its barrel. The removed thimble is then replaced, and if the tube of the spool is larger than the spool-spindle, the thimbles are shoved into its opposite ends, thus filling the vacancy and centering the spool upon the spindle. When the spool is in place the thread is

drawn from it, is passed through the open eye of the forward jaw, *f*, of the forceps, and is applied to the needle. The tension of the thread is adjusted by slacking or tightening the milled nut *P*, which is in a convenient position to admit of easy adjustment, and the sewing proceeds in the usual manner.

An examination of the drawings and of the foregoing description shows the distance between the hinge of the forceps and the point at which the force of the spring is applied is but a fractional part of the distance between the hinge and the spool; hence a considerable movement of the jaws from or toward each other will produce but a very slight increase or decrease in the tension of the spring, and the difference in the tension of the spring caused by moving the forceps sufficiently to adapt its jaws alternately to a full and to an empty spool is practically inappreciable. When, therefore, the tension has been adjusted for any one spool of thread, it remains practically unaltered until the thread is exhausted. It will also be perceived that the members of the forceps rock freely upon their pivot, and that the pressure of the spool against one side of its spindle by one jaw is counteracted by an equal and opposite pressure by the other jaw; hence the jaws adapt themselves to inequalities in the cylindrical form of the spool, and do not cause a frictional resistance between the spool and its spindle. In the apparatus thus described the thread from the spool is passed first through an eye in one of the jaws of the forceps. By this arrangement this jaw becomes a guide for the thread, and, as the thread is drawn off always at the same point of the spool-spindle, there is no tendency in the spool to work off the spindle; hence it is not necessary to provide a pin or other means to hold the spool in its place. As the eye in the jaw of the forceps is near its upper extremity, and as the jaw projects considerably above the spool, the thread proceeding from the latter is carried

first almost at right angles to its direct course to the needle; hence if the tension be inadvertently adjusted too tightly a strain upon the thread draws the eye-jaw of the forceps from the barrel of the spool, thus relieving the tension and diminishing the danger of breaking the thread.

It will be evident to the skillful mechanic that the apparatus herein described may be modified without affecting the principle of the invention. Thus, for example, I have described a coiled spring as used to effect the pressure of the jaws upon the spool; but it is evident that any other spring which will accomplish the purpose of the coiled spring will answer the purpose, or the jaws and spring may be formed in one piece if deemed desirable. The spool-spindle may also be located in any other position which it may be convenient or desirable to adopt, or any equivalent means for supporting the spool may be used.

I am aware that springs or spring-frictional brakes of various descriptions have been used to control the tension of the thread in sewing-machines, and therefore do not claim the employment of a spring for such a purpose; nor do I claim any arrangement or combination of a spring and other devices which operates upon a different principle from the combination devised by me; but

What I claim as my invention in sewing-machines, and desire to secure by Letters Patent, is—

A spring-forceps constructed substantially as herein set forth, in combination with a spool-spindle or equivalent means of supporting the spool.

In testimony whereof I have hereunto subscribed my name this 29th day of June, 1857.

SAMUEL LARKIN.

Witnesses:

MERRILL WHITE,  
DWIGHT MORRIS.