(No Model.)

R. K. CLARK.

THREAD UNWINDING AND TENSION DEVICE FOR SEWING MACHINES.

No. 444,208. Patented Jan. 6, 1891.

Fig. 1.

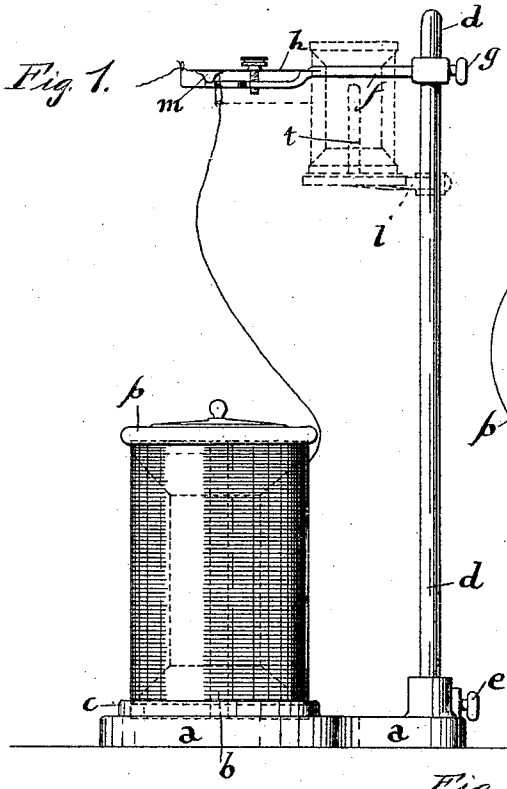


Fig. 2.

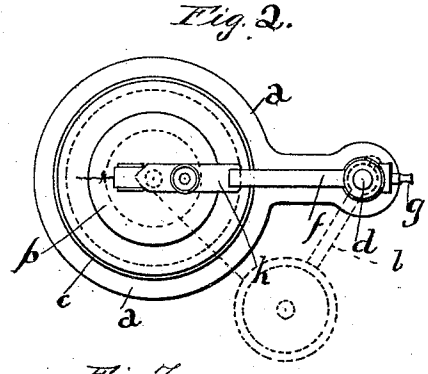


Fig. 7.

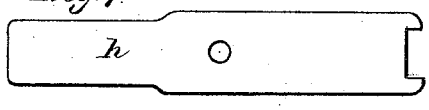


Fig. 3.

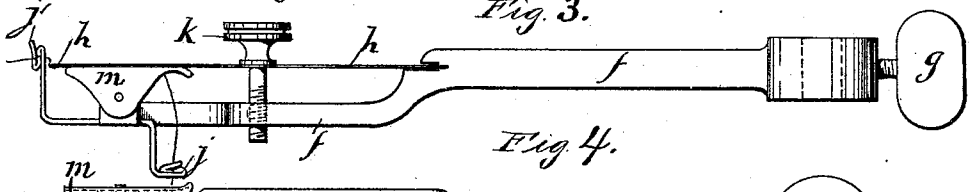


Fig. 4.

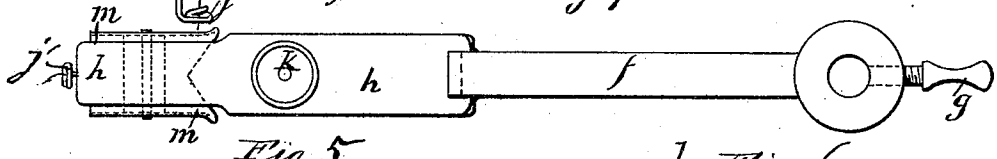


Fig. 5.

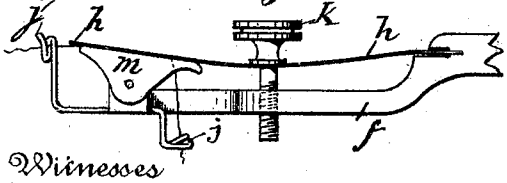
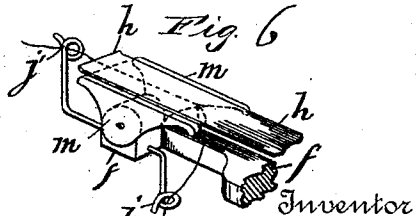


Fig. 6.



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UNITED STATES PATENT OFFICE.

ROBERT K. CLARK, OF NEWARK, NEW JERSEY.

THREAD-UNWINDING AND TENSION DEVICE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 444,208, dated January 6, 1891.

Application filed August 9, 1890. Serial No. 361,547. (No model.)

To all whom it may concern:

Be it known that I, ROBERT KERR CLARK, of Newark, New Jersey, have invented a new and Improved Tension and Unwinding Device for Spools, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of the whole apparatus with spool and thread in position, showing also in dotted lines the position which the spool may occupy. Fig. 2 is a plan view of the same. Fig. 3 is a side view of the tension device. Fig. 4 is a plan view of the device shown in Fig. 3. Fig. 5 is a side view of the tension device, showing the position of the same when the tension is tightened. Fig. 6 is a perspective view of the end of the tension device. Fig. 7 shows the tension-spring detached.

My improvement is designed to be used in connection with sewing-machines or whenever it is desired to unwind thread from a spool. There are two classes of spools which it may be required to unwind: first, those containing long lengths of thread—say over two thousand four hundred yards—and, second, those containing short lengths—say from two thousand four hundred down to two hundred yards. The weight of the former class makes it essential that it should remain stationary while the unwinding proceeds, and for this reason the thread must be lead from it to a point substantially in the prolongation of its axis. The lack of weight in the latter case interferes with its being unwound in this way and enables the pull of the thread in the direction of a point substantially in the extension of a radius about midway of its axis to turn it on a spindle in unwinding. My improvement is adapted for unwinding either class, requiring only that the two classes shall occupy different positions.

I will first describe the improvement as applied to unwinding the first class, which is shown in full lines in the drawings.

a is a base, provided near one end with a stud *b*, (shown in dotted lines in Fig. 1,) which is adapted to enter the hole in the spool. This stud is centrally located within a circular flange *c*, in which the spool is placed. At the opposite side of the base *a* is a rod or standard *d*, by which the tension device is supported. In the drawings this rod is shown as connected to the base by a socket, in which it is secured by the set-screw *e*.

f is an arm provided at one end with a hole of a size to loosely encircle the rod *d*, and with a set-screw *g* to hold the arm at any desired elevation on the standard. The length of the arm *f* and the distance of the standard *d* from the stud *b* are so regulated that the tension device will be directly above the stud *b*, and hence above the center of the spool.

Upon the outer end of the arm *f* is the tension device. This consists of a flat spring *h*, secured at its inner end to the arm, and a swinging plate *m*, attached to the extremity of the arm, so as to be directly beneath the spring *h* at its outer or free end, the arm *f* being curved at its outer end, as shown, so as to bring the swinging plate under the spring. The connected end of the spring is forked, as shown in Fig. 7, so that it is retained in position by being simply inserted in a slot in the arm. Therefore it can be readily removed and replaced by another, if required. The natural force of the spring causes its free end to press against the plate *m*, and thus clamp the thread which passes between the two. By means of the thumb-screw *k* the pressure of the spring on the plate may be regulated and the tension on the thread increased or diminished. The swinging plate *m* is pivoted to the arm *f* in such a manner that the plate can turn or swing freely in a vertical plane. By this means the plate adapts itself at all times to the pressure of the spring, so that the clamping-surfaces of the plate and spring, where it rests on the same, are always parallel, and the pressure of the spring will be the same on all parts of the plate, thus insuring an even tension on the entire length of the thread between the clamping-surfaces at any strength.

The forward end of the plate *m*, or that end at which the thread enters the clamping device, is made V-shaped, Figs. 4 and 6, in order to guide the thread to the center of the clamping-plates, the branches of the V extending beyond the side edges of the spring in order to more readily engage the thread with the plate, and consequently facilitate the guiding of the thread to the apex of the V. I use the term "V-shaped" in a general sense, as in-

dicating a form adapted to center the thread at the point where it enters upon the plate. The thread is guided to and from the tension device by the eyes *j j'* on the end of the arm *f*, as shown, part of the arm *f* being cut away, as seen in Fig. 6, to allow the thread to pass up to the center of the plate.

To assist in holding the spool on the base *a* and at the same time to insure the thread unwinding freely from the spool, I place a metal cover or plate *p*, having a smooth edge, on the top of the spool. This presents a polished edge for the thread to slide against in unwinding.

In operation the spool is placed in position, as shown in Fig. 1, with the cover *p* on top of it. Then the thread is threaded through the eyes *j j'* and between the spring *h* and plate *m*, and is thence carried to the sewing-machine or wherever required, and as the thread is consumed it is drawn through the tension device and unwound from the spool.

The apparatus thus described may be readily taken apart, when desired, for any purpose, and when together may be moved about and placed wherever required.

When required to apply this device to the unwinding of the short-length spool, the spool is placed in the position shown in broken lines in Figs. 1 and 2, so that the guide *j* is about opposite the middle of the spool-barrel. The spool is here placed on a spindle *t*, on which it is free to revolve, and which may be supported on the standard *d* by the bracket *l*.

While I have described the tension device as part of an unwinder, I do not wish to limit myself to it in that combination, since I am aware that it may be used wherever it is desirable to produce tension on a thread.

One great feature of utility lies in the fact that the tension-surfaces in contact with the thread are practically invariable, because the V-shaped end of the plate *m* causes the thread always to run across it on the same line, and its pivotal support enables it to adjust itself to different angles of the spring, so that the length of pressing-surface remains constant.

Although I have described what I now believe to be the best form of construction in which to embody my invention, I do not intend to limit myself thereto, but intend to cover all forms coming within the principle of my invention.

I claim—

1. In a tension device, in combination with a seated spring, a set-screw controlling the same, a pivoted plate beneath the spring and supporting the free end of the same, and an arm upon which said plate is pivoted, said plate being V-shaped at its end next the confined end of the spring, and said arm being provided with a passage-way for the thread below the apex of said V, substantially as described.

2. In a tension device, in combination, a seated spring, a set-screw controlling the same, a plate beneath the spring and supporting the free end of the said spring, and an arm supporting the plate, the said plate being V-shaped at its end next the confined end of the spring and the extremity of the V extending laterally beyond the edge of the spring, substantially as described.

3. In combination, the base *a*, adapted for the stationary support of a long-length spool, a standard *d*, a bracket *l* secured thereto, adapted for the support of a revolving short-length spool, a tension device, means for varying the tension thereof, and an arm adapted to support said tension device axially with respect to the first-named spool and radially with respect to the last-named spool, substantially as set forth.

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