

UNITED STATES PATENT OFFICE.

HIRAM HOLDEN, JR., OF SPENCER, MASSACHUSETTS.

TENSION DEVICE FOR SEWING-MACHINES.

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Application filed August 10, 1883. (Model.)

To all whom it may concern:

Be it known that I, HIRAM HOLDEN, JR., of Spencer, in the county of Worcester and State of Massachusetts, have invented a new and Improved Tension Device for Sewing-Machines, of which the following is a full, clear, and exact description.

My invention consists of improvements in tension devices for wax and dry thread machines, whereby it is designed to provide more efficient means therefor and better tension than other devices afford, and particularly to slack the tension while the needle is passing the thread through the work, and to arrange the tension device in duplicate, both of the tension-wheels being arranged on one supporting-stud, and so contrived that each may be adjusted for varying the tension without interfering with the other, all as hereinafter fully described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of part of a sewing-machine with my improved tension device in side elevation. Fig. 2 is a front elevation. Fig. 3 is a section of the tension device along the supporting-stud of the tension-wheels. Fig. 4 is a detail view of a dog, *n'*, to be described hereinafter.

A represents the head of the arm of the sewing-machine, in which the awl-bar *a*, presser *b*, and the thread-guide *d* are supported. *c* represents the needle-bar, and *d'* the cast-off bar below the work-plate *e*. These are represented as in the machine of common use, to which my improved tension device is to be applied, said tension device being constructed on a plate, *f*, which is attached to the side of the head *A* by the screw *g*, said plate supporting a long stud, *h*, about midway from top to bottom of said plate, said stud being for the support of the tension-wheels *i* and *j* and the devices for regulating the tension of the same, which consists of the tube *k*, collar *l*, spring *m*, and nut *n* for the wheel *i*, washer *o*, spring *p*, and nut *q* for the wheel *j*. The tension-wheels consist of a middle disk, *s*, having a milled or roughened edge, to cause the thread to bind with sufficient friction to in-

sure the turning of the wheels, and two disks, *t*, having bevel-edges, to form the groove for the thread. Back of the top of the disks is a rod, *u*, having guide-eyes for the threads *v*, which run onto the wheels from the wax-cup *w* or thread-spool, said rod being supported on an arm, *x*, which is pivoted on stud *h* between wheel *i* and the plate *f*, and has a stud-pin, *y*, which engages with plate *f* in any one of a series of holes, *z*, arranged in a circle in said plate, by which to set the thread-guides higher or lower, as may be required. The tension-wheels are to be shifted back to allow the guide *u* to be shifted. The upper end of the plate *f* carries a stud, *a'*, on which two collars, *b'*, are fitted and adjustably secured by set-screws *c'*, to which collars the take-up wires *d''* are fitted, said wires being coiled around said collars suitably to give said wires a sensitive spring and for fastening them, and they extend downward in front of the tension-wheels, where they extend through slotted posts *e'*, projecting forward and a little upward from a flange, *f'*, of the lower front part of plate *f*, and having adjusting-screws *g'*, with check-nuts *h'*, by which to limit the range of the movement of said take-up wires, which have guide-eyes *i'* in the end, through which the thread passes after passing through eyes *i'* at *j'* in the lower ends of the posts *e'*. From the eyes *i'* the thread passes through other eyes, *k'*, at the lower end of flange *f'*, and thence to the eye *e''* of the guide *d*.

On the stud *a'*, back of the plate *f*, a lever, *l'*, is pivoted, which extends downward in about the plane of the take-up wires, and carries an arm, *m'*, which extends across the take-up wires, to be thrust down on them, to slack the thread when the needle is passing through the work, by a dog, *n'*, pivoted in the ears *o'* of a collar, *p'*, fitted to the awl-bar at the right position to act on said lever *l'* at the time the needle is passing through the work. When the needle has passed through the work with the dog *n'* escapes from the end of lever *l'*, and a spring, *q'*, suitably connected with it and plate *f*, throws the lever up, allowing the take-up to spring back against gage-screws *g'* and take up the thread again. The needle is thus relieved of all strain by the thread while drawing the thread through the

work, and thereby works easier and better. The dog *n'* is so arranged that it swings down and passes the lever *l'* when the awl-bar rises. It then swings forward again, ready to act on the lever *l'* when the bar again descends. It will be seen that the tension-wheel *i* may be adjusted for varying the tension by the nut *n* without affecting the tension of wheel *j*, and the latter may be adjusted by nut *q* without affecting wheel *i*, its tension being governed by the pressure of the spring *p* between collar *l* and nut *q*. To hold the tube *k* against turning on the stud *h* when the tension is in operation, or when the nut is turned to adjust the tension, a washer, *s'*, for the inner end of the spring *m* is fitted to the flat sides *l'* of the stud, so that it cannot turn, and has a bit, *v'*, fitting in a notch in the end of said tube. The lever *l'* has a plate extension, *v'*, overlapping plate *f* to some extent, and having a slot, *w'*, working along a stud-pin, *x'*, of plate *f*, for a stop to limit the play of the lever by the dog *n'* and spring *q'*.

In the drawings a single-thread machine is shown; but this tension device is intended more particularly for application to double or two threaded machines, such as are used for sewing two seams at once.

I propose to employ this improved tension device either in duplicate, as here shown, or single, as may be required.

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

1. The combination, with the plate *f*, having stud *h* and shifting tension-wheels *i j*, the

rod *u*, having guide-eyes, and a wax-cup or spool, of the supporting-arm *x*, pivoted on stud *h* between said plate and wheel *i*, and having a stud-pin, *y*, fitted in one of a circle of holes, *z*, in said plate, whereby the thread-guides may be set higher or lower, as described.

2. The plate *f*, having flange *f'*, with eyes *k'*, and stud *a'*, with adjustable collars *b' b'*, the take-up wires *d''*, coiled around said collars and having guide-eyes *i'*, the slotted posts *e'*, provided with adjusting device *g' h'*, and the guide *d*, having eye *e''*, in combination with the lever *l'*, having arm *m'*, the pivoted dog *n'*, the awl-bar having collar *p'*, with ears *o'*, and the needle, operated substantially as described.

3. The combination, in a tension device, of duplicate tension-wheels *i j*, arranged on a stud, *h*, and provided with sleeve *k*, nut *n*, spring *m*, and washer *s'*, for adjusting wheel *i*, and collar *l*, nut *q*, spring *p*, and washer *o*, for adjusting wheel *j*, substantially as described.

4. The tension-wheels *i j*, mounted on a stud, *h*, attached to plate *f*, which plate also carries the take-up wires *d''* and lever *l'* by the stud *a'*, and also carries the guide-posts *e'* and eyes *k'* by flange *f'*, and is adapted to be attached to the awl-bar-carrying head of a sewing-machine, substantially as described.

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Witnesses:

GEO. W. LACKEY,
SCHUYLER D. CORBIN.