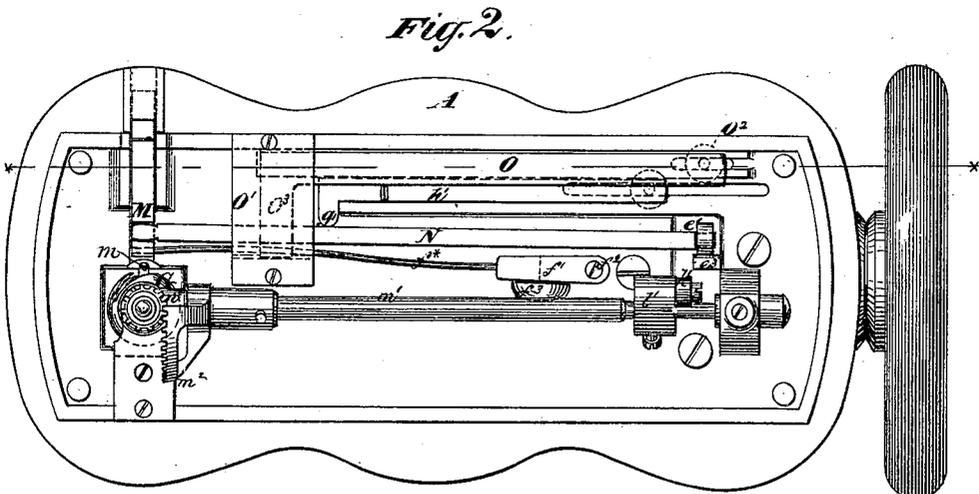
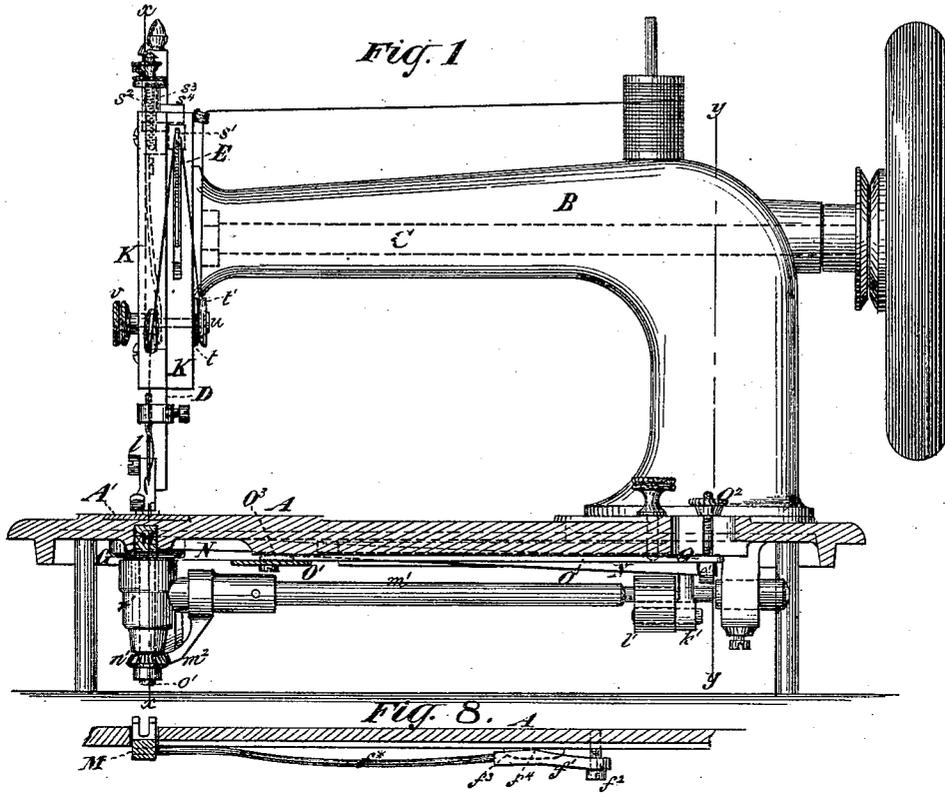


G. JUENGST.
Sewing-Machine.

No. 228,820.

Patented June 15, 1880.



Witnesses
 John Becker
 Diet Haynes

Inventor
 George Juengst
 By His Attorneys
 Brown & Brown

UNITED STATES PATENT OFFICE.

GEORGE JUENGST, OF NEW YORK, N. Y.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 228,820, dated June 15, 1880.

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To all whom it may concern:

Be it known that I, GEORGE JUENGST, of the city, county, and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings.

This invention is, in part, applicable to all kinds of sewing-machines, but some features of it are or may be limited in their application to machines of one or more particular classes; but the whole invention is capable of embodiment in a single machine, as illustrated in the accompanying drawings.

One part of my invention relates to the take-up for taking up the needle-thread. The kind of take-up which I employ is that in which the principal element is a vibrating arm or lever; and this part of my invention consists in a novel construction and arrangement of the said lever and novel means of operating and controlling the operation of the same, whereby its efficiency is increased.

Another part of my invention relates to the mechanism for feeding the cloth or material to be sewed. This part of my invention consists in a novel system of separately-adjustable fulcrum-slides and fulcrums for separately varying the movements of the feed-lever both horizontally and vertically, and thereby varying the relative horizontal and vertical movements of the feed-dog. This improvement in the feeding mechanism is applicable to sewing-machines of various kinds.

Another part of my invention relates to that class of sewing-machines in which a loose bobbin-holder or thread-case containing the secondary or locking thread is arranged within an oscillating hook, which is employed to extend the loop of the needle-thread; and it consists in a combination of the feeding-dog with the bobbin-holder, whereby the feeding-dog in its downward motion is made to press on the bobbin-holder, and so made to press the latter away from the position to which it has been brought in the tightening of the last previously-formed stitch, so that when the dog rises again the bobbin-holder may be left free for the passage of the loop of the needle-thread over or around the bobbin. This part of my

invention also embraces means of providing for a regulated pressure of the feeding-dog.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a two-thread sewing-machine having my improvements applied. Fig. 2 is an inverted plan of the machine. Fig. 3 is a transverse vertical section of the machine in the line *xx*, (shown in Fig. 1.) Fig. 3* is a face view of the take-up and its operating mechanism. Fig. 3** is a perspective view of the take-up lever and devices for restricting and controlling its upward movement. Fig. 4 is a transverse vertical section of the machine in the line *yy*, Fig. 1. Fig. 5 is a vertical section, parallel with Fig. 1, of the head of the machine in illustration of the devices for operating the needle-bar and take-up. Fig. 6 is a vertical section, parallel with Fig. 1, showing part of the mechanism for operating the feed. Fig. 7 is an elevation, partly in section, illustrative of the hereinbefore-mentioned operation of the feeding-dog on the bobbin-holder. Fig. 8 exhibits a vertical section, on a larger scale than the other figures, of the feeding-dog, and side view of its reaction-spring, illustrating the adjustment of said spring.

Similar letters of reference indicate corresponding parts in the several figures.

A is the cloth-bed, and B the stationary arm, in which is supported the main shaft C, from which motion is derived to operate the several working parts of the machine.

D is the needle-bar, arranged to work up and down within the head K of the machine. This needle-bar has fastened to it the grooved or slotted cross-piece *e*, which serves to receive within it a roller, *d*, on the wrist-pin *e* of the disk or crank *f*, fast on the forward end of the main shaft C, whereby the requisite up-and-down motion is communicated to the needle-bar. The same wrist-pin carries a second roller, *g*, acting under the lower arm, *i*, of the double armed or pronged take-up lever E against the pressure of a spring, *h*, which is coiled around the fulcrum-pin *k* of said lever, and keeps said lower arm down on the roller *g*, and serves to return it after being lifted by said roller. The pivot or fulcrum *k* is near and above the circle described by the roller *g*, and the under surface of the arm *i*, against which

said roller acts, is curved to correspond with the circle described by said roller during the upper portion of its movement, as shown in Fig. 3*, thus causing the take-up lever to come to a positive rest against an elastic cushion or stop, *s'*, as shown in the last-mentioned figure, where it rests until the needle has descended so far that its eye has arrived near the level of the upper surface of the thickest material to be sewed, at which time the take-up lever begins to descend and pay out the necessary slack thread to pass through the material with the needle and to form the loop for the next stitch.

The elastic cushion *s'*, which stops the take-up lever from being jerked up too far and thereby breaking the thread, consists of a small piece of india-rubber tubing inserted into a cavity in the head *K*, and the said cushion is made adjustable to give it more or less resisting power by the variable pressure produced on it by an upright regulating-screw, *s*², (see Figs. 1 and 3**,*) screwing into the head *K* of the machine, and a presser, *s*⁴, which works through a slot in the top of the head, and which is fitted with a sleeve, *s*³, to said regulating-screw. The pressure produced on the tubular rubber cushion *s'* by the screw and presser above mentioned, according as such pressure is greater or less, more or less flattens it, and so more or less increases its resisting power. The object of this variation is to afford provision for a sufficient resistance to the upward momentum of the take-up lever when moving at very high speeds, and to avoid so much resistance as to add unnecessarily to the power required to drive the machine in running at low speeds.

The variable cushion enables a lighter spring, *h*, to be used for keeping the take-up lever against the crank-pin. This take-up is applicable to various kinds of sewing-machines; but the following description of its operation, in combination with the oscillating hook *G* and contained bobbin-holder or thread-case *H*, for supplying the secondary thread in the machine represented, will apply to its operation in combination with a shuttle or other device for carrying a secondary thread or extending the loop of the needle-thread.

Owing to the construction of the curvature of the lower arm, *i*, of the take-up *E* *i*, and the arrangement of its pivot or fulcrum *k* relatively to the center of the main shaft *C*, as hereinabove described, the motion of the take-up is so regulated that the time of its rest against the cushion *s'* is continued for about one-quarter of the revolution of the shaft *C*. During the next two quarters of the same revolution the take-up is caused to descend by the action of its spring *h* paying out the necessary thread, and during the remaining quarter of said revolution, which is after the needle leaves the throat-hole of the cloth-plate, and after the oscillating hook *G* has carried the needle-thread loop around the bobbin-holder *H*, within said hook, said take-up *E* *i* is

moved upward again till arriving at its highest point in the completion of the revolution of shaft *C*.

The feeding-dog *M* is operated by a cam, *d'*, (see Figs. 4 and 6,) on the main shaft *C*, working in a yoke at the upper end of a lever, *e'*, which works against the adjustable fulcrum-piece *e*³, secured by a screw, *e*⁴, to the stationary arm *B*, and the lower end of which is connected with the feed-lever *N*, which is supported on a rounded fulcrum-bearing, *O*³, forming part of the horizontally and longitudinally adjustable slide *O*, which rests upon a stationary sole-plate, *O'*, and is held in its position of adjustment by a screw passing through a slot in the bed-plate and furnished with a clamping-nut, *O*², above. The said lever *N* has also a lateral fulcrum, *g'*, (see Fig. 2,) attached to or carried by a horizontally and longitudinally adjustable slide, *h'*, which is also held in its position of adjustment by a screw passing through a slot in the bed-plate.

The up-and-down movement of the feeding-lever takes place on the fulcrum *O*³, and the forward-and-backward movement on or against the fulcrum *g'*, and each fulcrum being separately adjustable provides for the independent adjustment of the length of feed and height of the rise of the feed-dog.

The upward and forward movements of the feed-lever *N* and the feeding-dog *M* are made positive by the cam, but the downward and backward movements are produced by the reaction of a spring, *f*^{*}. (See Figs. 2 and 8.) Said spring is made adjustable by being fastened to a rocking shank, *f'*, which, by means of the screw *f*², (see particularly Fig. 8,) may be held in a more or less inclined position, whereby the vertical pressure of said spring may be varied, for reasons to be hereinafter explained.

The oscillating hook *G*, which has loosely arranged within it the bobbin-holder *H*, containing the bobbin which supplies the thread, is driven by an eccentric, *P*, which operates through a rod, *k'*, upon a rock-shaft, *m'*, which has on its forward end a toothed sector, *m*², which gears with a pinion, *n'*, fast on the upright arbor *o'* of the hook *G*.

The bobbin-holder or thread-case *H*, (see Fig. 7,) which is of circular form, consists of two cup-shaped pieces of steel or other metal, which combine to form a closed box, in which is contained the bobbin or cap for supplying the locking-thread.

The bobbin-holder may be of well-known construction; but I propose generally to employ one of peculiar construction, which forms no part of this invention, and which I may make the subject of a separate and distinct application for a patent, and which, therefore, does not need here any particular description.

In this invention the feeding-dog *M*, actuated by cam *d'*, lever *e'*, lever *N*, and spring *f*^{*}, performs another and important function besides moving the material to be sewed and spacing the stitches, inasmuch as when the

stitch is tightened the loose bobbin-holder or thread-case H is drawn up against the feeding-dog M, or if said dog should rise so high that its under side would be above that of the plate A', then the bobbin-holder is drawn against said plate A', as shown in Fig. 7, and the pressure so produced, and which is proportionate to the tension of the bobbin-thread, would materially interfere with the forming of a good and even seam.

To overcome this difficulty, which is always found where a stationary bobbin-holder or shuttle is used, the forward end of the feeding-dog M is made to overlap one side of the bobbin-holder H, as shown in Figs. 3 and 7, and being forced down, as shown in dotted outline in Fig. 7, by the action of spring f^* , and to a certain extent by the yielding pressure of the presser-foot, it forces the raised side of the bobbin-holder down to its normal or nearly level position. Now, the feeding-dog slides back, keeping said bobbin-holder down; but the following rise or lift motion of said dog leaves the bobbin-holder in a free and slightly loose condition, whereby an unobstructed passage for the needle-thread around the bobbin-holder is secured.

The spring f^* is adjustable in its downward pressure by means of the screw f^2 at the rear part of the socket f^1 , which latter bears against the lug f^3 (see Figs. 2 and 10) and rocks on the under side of the bed at the point f^4 , (see Fig. 10,) whereby it is possible to have the pressure always in excess of the resistance caused by the different degrees of tension on the bobbin-thread.

I claim—

1. The combination, with the needle-bar and a rotary shaft and attached crank-pin for operating the same, of the take-up lever operated by said crank-pin and a spring for keeping said lever in contact with said crank-pin, said lever having its pivot or fulcrum pin arranged above the circle described by said crank-pin,

and having its under side, upon which said crank-pin operates, of a curvature corresponding with the arc described by said crank-pin, substantially as and for the purpose herein described.

2. The combination, with the sewing-machine head and the take-up lever, of an adjustable elastic tubular stop-cushion inclosed within said head, an adjusting-screw screwing into the said head, a sleeve fitted to slide on the said screw, and a presser attached to the said sleeve and bearing upon the said stop-cushion with a pressure adjustable by said screw, substantially as herein described.

3. The combination, with the feeding-dog M and feed-lever N, of the separately-adjustable slides b' and O, carrying the two independent fulcrums g' and O³, upon which the said lever has, respectively, its horizontal and its upward and downward movements, whereby convenient provision is afforded for the separate and independent adjustment of the length of feed and the height of the rise of the feeding-dog, substantially as herein described.

4. The combination, with the oscillating hook and a loose bobbin-holder or thread-case arranged therein, of a feeding-dog operating on the under side of the material to be sewed, and arranged to overlap the said bobbin-holder or thread-case for the purpose of depressing the same, substantially as herein described.

5. The combination, in a sewing-machine, of an oscillating hook and a loose bobbin holder or case arranged therein for carrying the locking-thread, a feeding-dog adapted to operate on the under side of the material to be sewed and overlap the said bobbin-holder, a spring which presses the said dog downward, and means of adjusting the said pressure of said spring, substantially as herein described.

GEORGE JUENGST.

Witnesses:

FREDK. HAYNES,
THOMAS E. BIRCH.