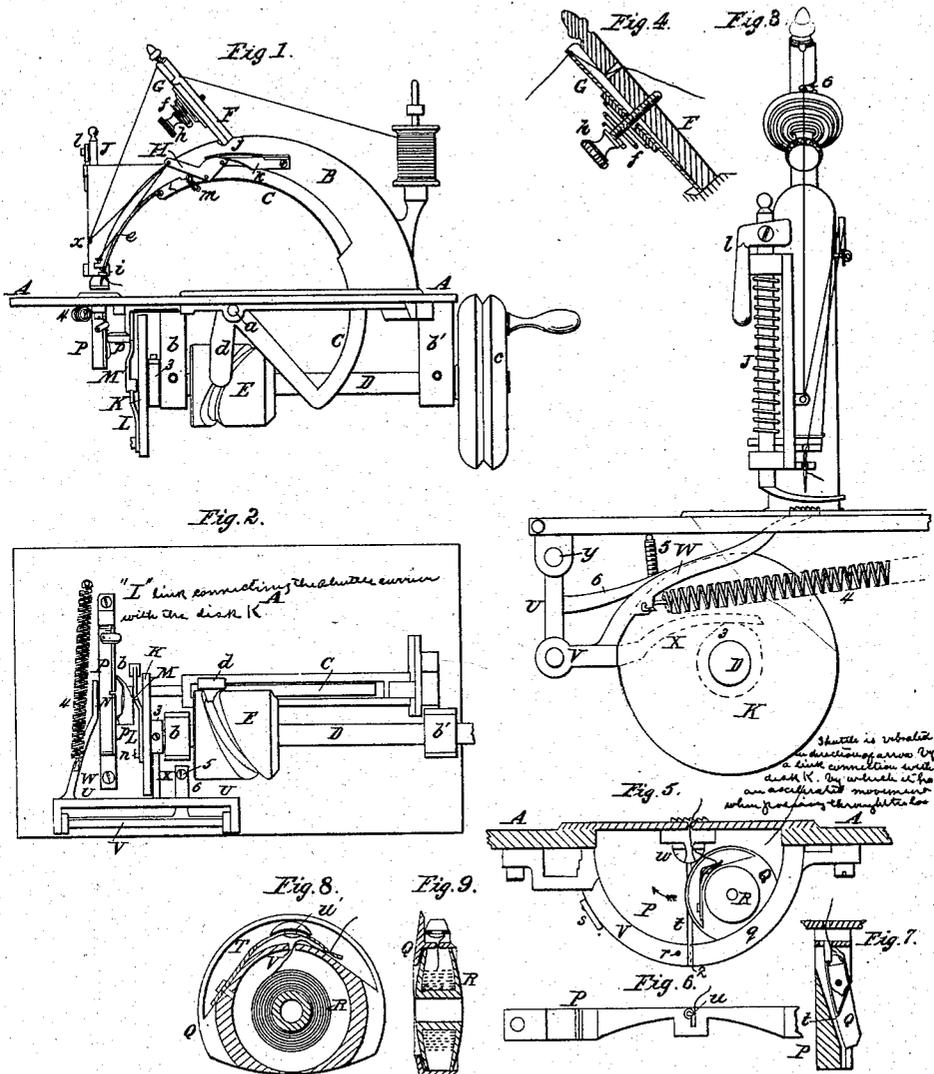


S. COMFORT, Jr.  
SEWING MACHINE.

No. 32,239

Patented May 7, 1861.



Witnesses:

Henry Howler  
Charles C. Foster

Inventor:

Saml Comfort Jr.

# UNITED STATES PATENT OFFICE.

SAMUEL COMFORT, JR., OF MORRISVILLE, PENNSYLVANIA.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 32,259, dated May 7, 1861.

*To all whom it may concern:*

Be it known that I, SAMUEL COMFORT, Jr., of Morrisville, Bucks county, Pennsylvania, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists, first, in a novel device for imparting tension to the needle-thread; secondly, in a device for imparting tension to the shuttle-thread.

In order to enable others to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a side view of a sewing-machine with my improvements; Fig. 2, an inverted plan view; Fig. 3, an end view of the machine, drawn to an enlarged scale and illustrating the feed-motion; Fig. 4, a sectional view of the device for imparting tension to the needle-thread; Fig. 5, an inside face view of the shuttle-race and shuttle; Fig. 6, a plan view of Fig. 5; Fig. 7, a transverse vertical section of Fig. 5 on the line 1 2; and Figs. 8 and 9, enlarged sectional views of the discoidal shuttle or spool-case, with the spool.

Similar letters refer to similar parts throughout the several views.

A represents the base-plate of the machine, and B the stationary arm secured to the said plate.

To a pin, *a*, on the under side of the base-plate is jointed the needle-arm C, which passes through the plate and through the lower portion of the stationary arm B, the upper edge of the needle-arm forming part of the circumference of a circle of which the fulcrum-pin *a* is the center, the under edge of the stationary arm being formed to coincide with this circle, as seen in Fig. 1.

D is the driving shaft, turning in projections *b* and *b'* on the under side of the base A, this shaft being furnished with a driving-pulley, *c*, and a scroll-cam pulley, E, into the groove of which fits a roller hung to a pin on the end of the short arm *d* of the needle-arm C. The needle *e* is bent to such a curve and is secured to the end of the needle-arm in such a position

that it shall coincide or nearly coincide with the under edge of the stationary arm B, which edge, as before remarked, is part of the circumference of a circle of which the pin *a* (the center of vibration of the needle-arm) is the center, as described in the patent granted to me and F. H. Jackson, November 9, 1858.

To the top of the stationary arm B is secured the inclined pillar F, and in front of the latter is attached a bar, G, by means of a set-screw, *h*, between the head of which and the bar intervenes a helical spring, as seen in Fig. 4. This bar G is made concave on the inside, so as to be adapted to the pillar, and has at the top a notch for receiving the needle-thread, the latter passing from the spool, through an orifice in the pillar, and upward between the latter and the bar G.

To a pin situated near the end and on one side of the needle-arm a lever, H, is hung loosely, the long arm of the lever having an eye for the passage of the needle-thread. The upper edge of the short arm of this lever is curved, and arranged to bear against a spring, *j*, secured to the stationary arm B, to which is also attached a guard, *k*, curved on the under edge, against which a pin projecting from the short arm of the lever bears during the movement of the machine. A slotted projection, *m*, on the lever H, through which passes a pin into the needle-arm, serves to limit the movement of the said lever. The stationary arm B is furnished with a spring pressure-bar, J, having the usual pad and the lever *l* for elevating the said bar and allowing it to fall by the action of the spring at pleasure. As these devices are common to other sewing-machines, and as they form no part of my present improvements, further allusion to them will be unnecessary.

The curved needle passes through a guide, *i*, situated at the outer extremity of the stationary arm B, the slot through which the needle passes being open in front, so as to prevent the cutting of the thread, and of a width sufficient to allow the needle to pass freely without producing inordinate friction. The needle-thread, as before remarked, passes through an orifice in the inclined pillar F, and upward between the pillar and the spring-bar G, and through a notch in the latter, from whence it passes downward through an eye, *x*, on the stationary arm, upward and through the eye of the

lever H, and downward through an eye near the extremity of the stationary arm, and thence through the eye of the needle to the fabric.

To the front end of the shaft D is secured the crank-wheel K, the periphery of which is eccentric with the shaft, for a purpose which will be rendered apparent hereinafter. The pin *n* of this crank-wheel is connected by a rod, L, to the lower end of the lever M, which vibrates in the under side of the base-plate A, the lever being provided with two lips or projections, *p p*, bearing one on one side and the other on the opposite side of the discoidal shuttle N, which is loosely confined to the concave shuttle-race P by the aforesaid lips. The shuttle is partially cut away at one portion of its circumference, as seen in Fig. 8, this portion being adapted to and resting on the ledge *q q*, which forms the arc of a circle the center of which is at a point between the fabric to be operated on and the upper edge of the shuttle, the latter being prevented from rising in the race by the projection *w*, near which is an opening for guiding the shuttle-thread, as seen in Fig. 5. One portion of the ledge *q* of the shuttle-race is hinged at *r*, and is confined to its proper position by a set-screw, *s*, on turning which the loose portion of the ledge may be depressed and the shuttle abstracted from the race. A curved groove, *t*, is formed in the latter for receiving the needle, the upper end of the groove terminating at a slotted opening, *u*, Fig. 6, which serves to guide and steady the needle at a point between the fabric operated on and the shuttle.

The shuttle itself, which will be best observed on reference to the enlarged views, Figs. 8 and 9, is composed of an outer shell or casing, Q, with a circular recess for containing the spool R. This consists of two simple disks connected together by a tube, and is retained in its proper position in the case by the vibrating lever and its projections. The upper edge of the outer case is cut away for the reception of the spring T, one end of which is secured to the case, the opposite end bearing on the latter at a point beyond the orifice *v*. The spool-thread passes through this orifice, thence between the spring and the case, and thence through an eye near the end of the spring to the guide-opening near the projection *w*, and through the latter to the fabric. The spring is furnished with a block, *w'*, which is so arranged as to be readily moved backward and forward along the spring, the rigidity of which is increased or diminished according to the position occupied by the block.

To a stationary spindle, *y*, secured to projections on the under side of the base-plate, is hung the rocking frame U, to the lower end of which is jointed another frame, V, and from the latter project the two arms W and X. The end of the arm W projects through an opening in the base-plate at or near the needle, the projecting portion of the arm having the usual serrated surface for moving the fab-

ric. The arm X bears upon a cam, 3, on the driving-shaft D, as best observed on reference to Fig. 5, this cam serving to elevate the arm, and consequently to raise the serrated surface on the end of the arm W. The lateral reciprocating motion of this surface is imparted by the combined action of the crank-wheel K and the spring 4, the edge of the crank-wheel, which, as before remarked, is eccentric with the driving-shaft, bearing against the frame V and moving it, with its arms X and W, outward; while the spring moves the whole inward as the projecting portion of the cam recedes from the frame. The extent of the movement of the serrated surface of the arm W is regulated by the screw 5, which passes through an arm, 6, on the rocking frame, and bears with its point on the under side of the base-plate A. It will be evident that by adjusting this screw the length of the stitch may be regulated at pleasure. The tension of the needle-thread is caused by friction between the spring-bar G and the pillar F, the amount of this friction being increased or diminished at pleasure by adjusting the set-screw *h*. When, by any accident, the free unwinding of the thread from the spool and its free passage to the frictional surface is interrupted or retarded during the operation of the machine, the top of the bar G will be pulled forward by the thread and will assume the position illustrated in Fig. 4, in which case the friction previously imparted to the thread between the orifice of the pillar and the top of the bar will be removed, the requisite tension being imparted to the thread by the obstruction to its free passage from the spool. When this obstruction is removed the spring-bar will recover its former position and press the thread against the pillar, as before.

It will be seen that by the peculiar construction of the spring-bar and pillar and their arrangement in respect to the direction of the thread the tension is self-adjusting or self-relieving.

As regards the tension of the shuttle-thread, it will be observed that the spring T, arranged in respect to the position assumed by the thread, as set forth, serves precisely the same purpose as the spring-bar G and pillar F, as arranged in respect to the needle-thread.

I wish it to be understood that I do not claim broadly passing the needle-thread or the shuttle-thread between a yielding bar or spring and a rigid object, inasmuch as tension has been heretofore imparted to threads by such means; but

I claim as my invention and desire to secure by Letters Patent—

1. Imparting tension to the needle-thread for producing the necessary tension on the same by means of a coiled or other suitable spring, *f*; a bar, G, or its equivalent, and the pillar I, or other suitable stationary object, when the fulcrum of the said bar, the thread-guide on the same, that part of the bar acted on by the spring, and the orifice in the pillar for the pas-

sage of the thread are so situated in respect to each other and to the direction taken by the thread itself that any retarding of the latter or interruption of its progress toward the frictional surface will remove the friction caused by the bar, as herein set forth.

2. The combination of the spring T with the discoidal shuttle, when the said spring is so situated in respect to the orifice *v* and in respect to the direction of the thread from the shuttle-spool to the fabric that any retarding

or interruption of the free passage of the thread from the spool will be the cause of removing the friction on the thread between the spring and case, as before specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAML. COMFORT, JR.

Witnesses:

HENRY HOWSON,  
CHARLES D. FREEMAN.