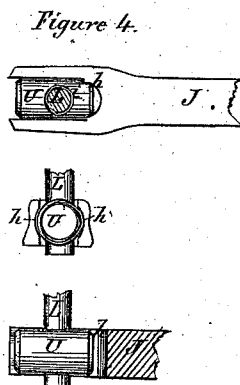
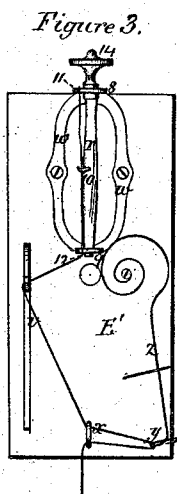
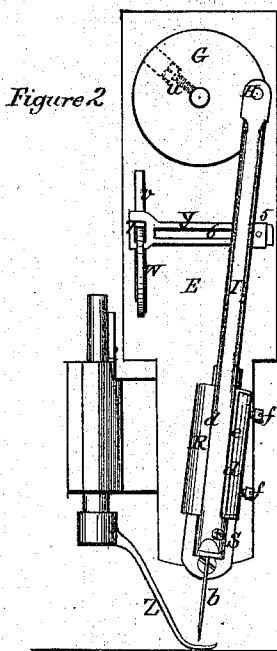
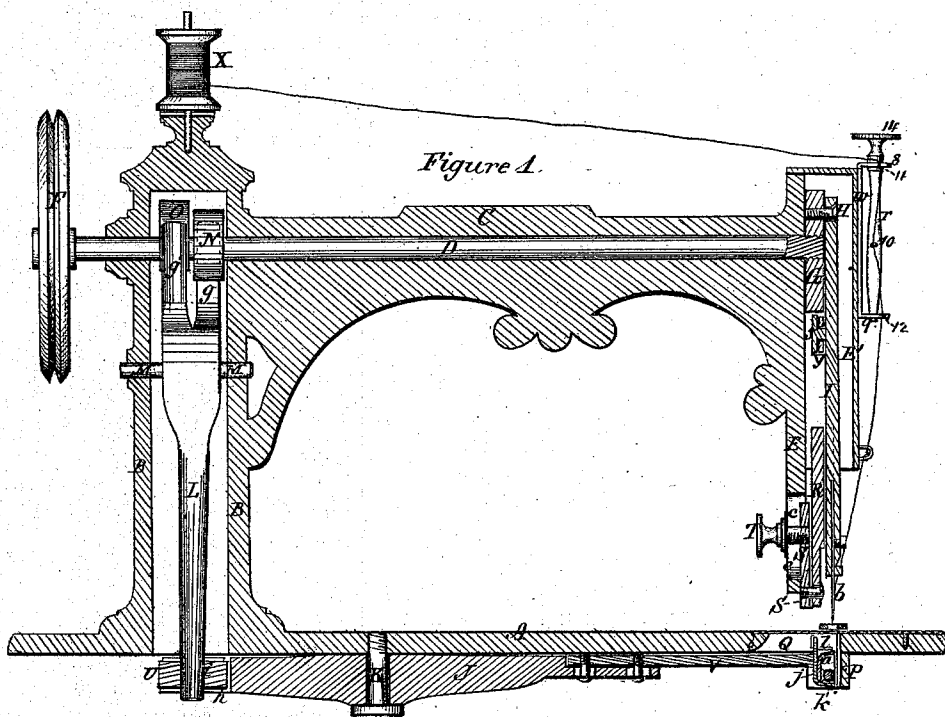


J. V. COON.
Sewing Machine.

No. 106,032.

Patented Aug. 2, 1870.



Witnesses.
 G. W. Johnson
 Char. C. Hoffman

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Figure 11.

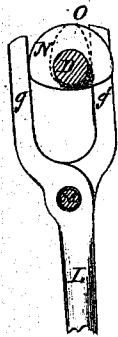


Figure 12.

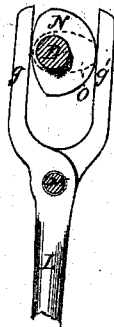


Figure 10.

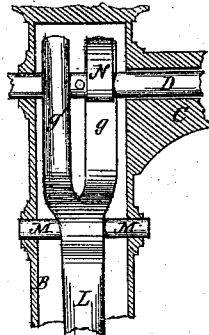


Figure 13.

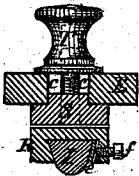


Figure 5.

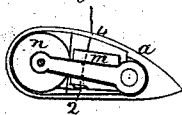


Figure 6.

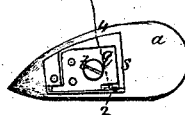


Figure 7.

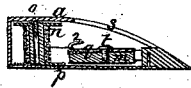
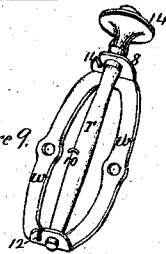


Figure 8.



Figure 9.



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UNITED STATES PATENT OFFICE.

JOHN V. COON, OF ELYRIA, OHIO.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **106,032**, dated August 2, 1870.

To all whom it may concern:

Be it known that I, JOHN V. COON, of Elyria, in the county of Lorain and State of Ohio, 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 thereof, reference being had to the accompanying drawings of the same, which make part of this specification, and in which—

Figure 1 represents a vertical longitudinal section of a machine embracing my invention. Fig. 2 represents an elevation of the needle-arm and its mechanism, the front plate being removed. Fig. 3 represents the front plate of the needle-arm case and the tension device of the needle-thread secured thereto. Fig. 4 represents top, end, and side views (full size) of the barrel-joint which connects the shuttle-bar with the pivoted arm of the driving-shaft. Fig. 5 represents a view of the inner side of the shuttle; Fig. 6, a view of its outer side; Fig. 7, a horizontal section, and Fig. 8 a view in perspective of the hinged tension device detached from the shuttle. Fig. 9 represents a view in perspective of the tension device of the needle-thread detached from its supporting front plate. Fig. 10 represents a section of the upper part of the standard, showing the pivoted arm and its operating-cams. Figs. 11 and 12 show side views of said cams and their pivoted arm; and Fig. 13, a horizontal section of the needle-bar, guide-plate, and tightening-gib.

In the accompanying drawings, A represents the bed-plate of the machine, from one end of which a hollow standard, B, rises, from which extends a hollow arm, C, within which the driving-shaft D is inclosed, and to the front end of said arm C is secured a vertical case, E, for inclosing the needle-bar. The driving-shaft D is secured in bearings at the front end of the hollow arm and in the rear side of the vertical standard, and carries on its rear end a driving band-wheel, F, and on its front end a disk, G, to a crank-pin, H, on the face of which the needle-bar I is secured, and from which it derives a reciprocating motion.

The bar J, which carries the shuttle *a*, is secured by means of a strong pivot-bolt, K, to the under side of the bed-plate, and is connected to the lower end of a vertical arm, L, pivoted by a bolt, M, within the standard, and receives a vibratory motion from cams N and

O, of peculiar construction, on the driving-shaft D to produce the required vibrating motion of the shuttle-bar J, and as the junction of these two parts is subject to constant wear and lost motion the means for effecting their connection to avoid such will be presently described. The shuttle *a* plays back and forth horizontally in the arc of a circle against a guide-plate, P, having a curve concentric with the pivot K of the shuttle-bar, secured to the under side of the bed-plate by screws passing through slots to allow the guide-plate to be adjusted toward or from the shuttle, and the bed-plate is made with an opening, Q, within which the shuttle plays, so as to bring its upper side near the top side of said plate.

The needle-bar I being attached to the revolving disk G, its upper end has a crank motion, the wrist or crank pin H of which is set about five-eighths of an inch from the axis of its shaft D to obtain the proper movement and throw of the needle-bar, to the lower end of which the needle *b* is secured. This end of the bar is carried by a guide-plate, R, pivoted at its lower end to an adjustable supporting-plate, S, fitted by a tongue within a slot, *c*, formed in the back plate of the inclosing case E and clamped by a thumb-screw, T, and the length of the stitch may be varied by raising or lowering the supporting guide-plate R, so as to vary the amount of the vibration of the needle, said guide-plate R serving as the fulcrum for the needle-bar. The needle-bar I is fitted and moved within a dovetailed guide, *d*, formed on the front side of the upper portion of the fulcrum-plate R, and the needle-bar is of corresponding form, so as to be held within said guide. In order to compensate for any wear of the needle-bar within its guide, a gib, *e*, Fig. 2, is fitted therein so as to be adjusted against it by means of set-screws *f*, and thus always maintain a close fit of this end of the needle-bar. By this arrangement the needle becomes a lever, so that each time it passes through the material its ascent moves the latter forward the proper distance for the next stitch.

The pivoted arm L of the shuttle-bar is constructed with two prongs or forks, *g g'*, at its upper end (which are not in the same plane) for the purpose of receiving the action of the cams N and O, placed adjacent to each other on the driving-shaft D, so constructed as to vibrate the said pivoted arm and produce the

proper stop and motion to the shuttle-bar and its shuttle at the proper time, because in this machine there is no stop motion to the needle-bar. This effect is produced by placing the acting portions of the cams at right angles to each other, the acting part of one, O, of which has a short turn, so that each revolution imparts to the shuttle-bar a rapid vibration, while the other, N, has an acting surface of about half the circumference, and produces the requisite stop motion of the shuttle at one end of its movement to allow of the ascent of the needle to form the stitch before the cam O again comes into action.

The device for connecting the pivoted vibrating arm L to the vibrating shuttle-bar J consists of a barrel-joint formed by a cylindrical bearing, U, fitted closely between the concave sides of the forked end of the shuttle-bar, by which said cylindrical bearing is held in place, while it is allowed to oscillate freely in its concave seat *h* as the lower end of the pivoted connecting-arm L is vibrated. The lower end of this pivoted arm is made cylindrical, and passes through a correspondingly-shaped opening, *i*, in the barrel-bearing U, so as to allow the latter to swivel as a socket over the arm to compensate for the arc described by the short end of the shuttle-bar. This connection of the pivoted arm with the cylindrical bearing U also allows the latter to have an axial movement within its concave seat *h* to allow said pivoted arm to vibrate in a straight line, while the shuttle-bar moves in the arc of a circle. The joint therefore, by this construction, admits of three compensating movements, neither of which produces the least binding or any perceptible wear.

The shuttle-frame consists of a back plate, J, fixed to the end of the bar V, and fitted on its front side with a supporting-flange, *k*, and holding-lips *l* to confine the shuttle therein and allow it to move against the inner side of the adjustable guide P. It is carried by an arm, V, fitted in a groove within the front end of the shuttle-bar J and secured by screws, so as to allow the shuttle to be adjusted toward and from said guide, as shown in Fig. 1.

The shuttle consists of a short case, *a*, within which the bobbin *n* is held in place by means of a pin, *o*, and spring-tension arm *p*, so that it may be removed to be refilled with cotton.

The device for producing the requisite tension upon the cotton from the bobbin consists of a short arm, *m*, hinged within the shuttle, and provided with a spring, *q*, and between the adjacent sides of this arm *m* and spring *q* the cotton is held, being first passed over a hook, 2, at the side of the arm *m* in such manner as to allow the thread to be drawn always in a straight line from the side of the bobbin, and then to be turned at right angles thereto to allow it to be drawn through a hole, 4, in the side of the shuttle in a proper direction to be locked with the needle-thread, as shown in Figs. 5 and 6. In this way I obtain a tension device that may have a slight swinging mo-

tion upon its hinge, and also be turned upon its hinge, so as to project through an opening, *s*, made in the rear side of the shuttle for that purpose, to afford facility for introducing the cotton over the hook 2 and beneath the tension-spring *q*. This spring is clamped to the inner side of the arm *m* by a screw, *t*, passing through its spring end into the arm, thus obtaining a hinged arm and spring in one piece, so that the elasticity of the spring will always produce a uniform tension upon the thread as it unwinds from the spool. The disk G of the driving-shaft D is secured thereon by means of a set-screw, *u*, (see Fig. 2,) so as to admit of its adjustment relatively to the crank-pin H of the needle-bar I and the cams N O, which operate the shuttle-bar J in such manner as to produce the movements of the needle and the shuttle at the proper moments.

The tension device for the needle-thread consists of a vertical stem, *r*, mounted in bearings 8 and 9 in a frame, *w*, secured to the front plate, E'. The stem *r* is about two inches in length, and its foot is slightly conical, in order to bite in its bearing 9, which, with the aid of the weight of the stem and a slight pressure thereon, will bind sufficiently to hold it in its bearings when set. It is provided in the middle of its length with a pin, 10, over and around which the thread from the spool X is passed, said pin being curved, in order to hold it thereon. The bearings of the stem *r* are formed in horizontal projections 8 and 9 from the plate *w*, and immediately at the side of each bearing a notch, 11 and 12, is formed, of such shape as to hold the spool-thread in the line of the pin, so that in partially swiveling the stem in its bearings the thread will be drawn by the pin 10 out of a straight line between the front plate, E', and the stem, and thus produce and maintain the requisite degree of tension upon the needle-thread. The stem *r* projects above the upper bearing, 8, and is provided with a milled head, 14, by which it is swiveled and pressed into its foot-socket, and the upper thread-notch, 11, of the stem-plate is just above the front plate, E', as shown in Figs. 1 and 3, so that the thread is received from the spool into the notch 11, thence round the deflecting-pin 10 into and through the lower holding-notch, 12, to the arm W of the take-up device.

The take-up device of the needle-thread consists of an arm, W, pivoted to the hollow arm, and extending through slots *v* in the front and rear sides of the inclosing case E E', and having its outer end curved downward through one of a series of holes, in which the thread from the tension device passes through a fixed eye, *x*, at the lower end of the front plate and looped over the hooked end *y* of a wire spring, *z*, having its upper end coiled and secured to said plate, from which the cotton is passed back through the same eye or staple, *x*, and through the eye of the needle. The pivoted arm W is operated by the vertical movement of the needle-bar by means of a slotted arm, Y, fitted to the needle-

bar so as to slide at right angles thereto over a rabbeted button, 5. While said arm W rises and falls with the needle-bar the latter by its button 5 will move within the slot 6 of the arm Y to allow of the crank motion of the upper end of the needle-bar. The slotted arm Y is prevented from moving with the crank motion of the needle-arm by its connection with the pivoted arm W by means of a slot, 7, which also allows said arm W to move up and down without binding, from which arrangement it will be seen that the latter rises and falls with the needle, and thus effects the required take-up of the surplus thread and tightens the stitch.

The presser-foot Z may be of the usual construction, and has a slot in its lower end to admit of the vibration of the needle.

The bed-plate is provided with the usual slides above the shuttle-race by which to obtain access to the shuttle, and one of these plates has a slot in it, which, in connection with one in the presser-foot, admits of the proper vibration of the needle.

The formation of the lock-stitch by the needle and shuttle threads and the feed of the material by the vibration of the needle being effected in the usual manner, their construction and operation need not be described.

Having described my improvements, I claim—

1. In a shuttle for sewing-machines, a tension device, substantially such as described, hinged therein, and operating as and for the purpose set forth.

2. The hinged arm *m* of the tension device of the shuttle, provided with a lateral hook, 2,

for the purpose of guiding the thread in the proper direction therefrom to the opening 4 in the shuttle, as herein shown and described.

3. The combination of the shuttle-case *a*, having an opening, *s*, in its back, the hinged tension device, with its spring *q*, made with a lateral lip or hook, 2, and the bobbin *n*, constructed and arranged as herein shown and described.

4. The slotted arm Y, loosely connected with the vibrating and reciprocating needle-bar I, in combination with the pivoted take-up arm W and the tension-spring *z* for the purpose of taking up the slack of the needle-thread to tighten the stitch, as herein shown and described.

5. The tension device consisting of a vertical stem, *r*, having a deflecting-pin, 10, the frame *w*, having a conical socket to receive the conical foot of the stem, and having slots 11 and 12 for the spool-thread, all constructed, arranged, and operating as herein described.

6. The driving-shaft D, with its cams N O and disk G, the barrel-joint U and shuttle-carrying arm J, the needle-bar I and its pivoted guiding-plate R, the tension and take-up devices W Y, the several parts being constructed, arranged, and operating as herein shown and described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN V. COON.

Witnesses:

C. W. JOHNSTON,
XENOPHON PECK.