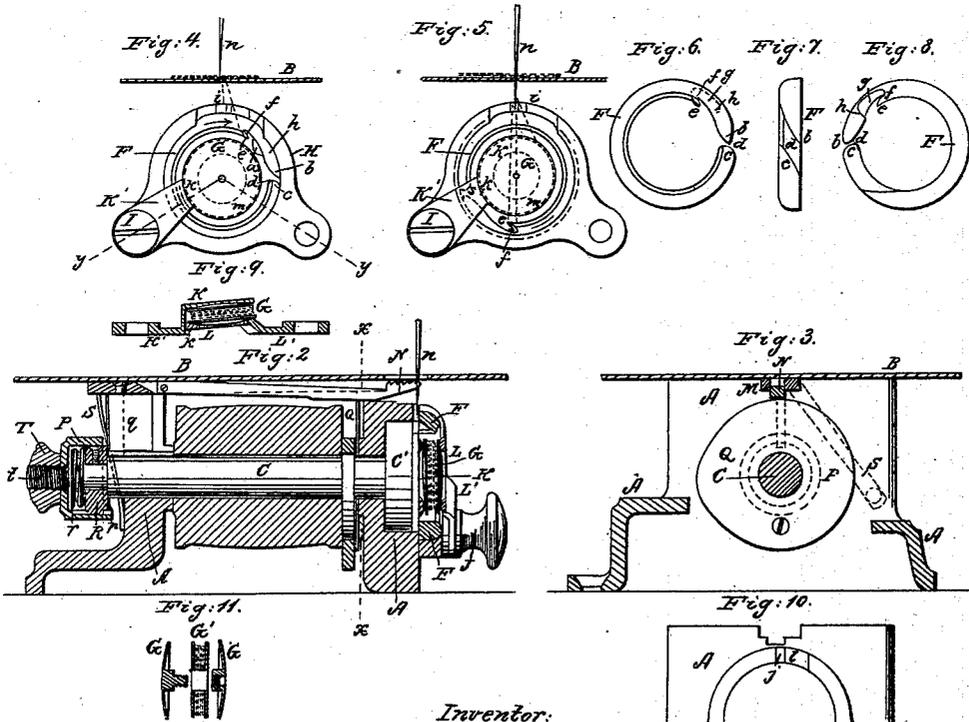
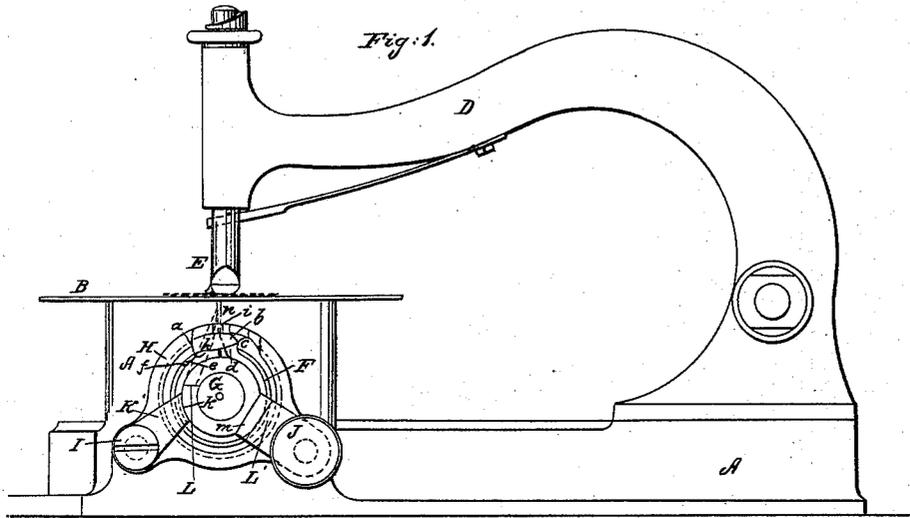


J. S. McCURDY.
Sewing Machine.

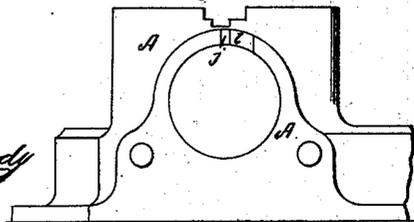
No. 62,050.

Patented Feb. 12, 1867.



Witnesses:
J. P. Coombs.
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Inventor:
James S. McCurdy



United States Patent Office.

JAMES S. McCURDY, OF NEW YORK, N. Y.

Letters Patent No. 62,050, dated February 12, 1867.

IMPROVEMENT IN SEWING MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JAMES S. McCURDY, 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 drawing, forming part of this specification.

This invention consists, firstly, in a rotating hoop of novel construction, so applied and operating in relation with a needle which carries one thread through the cloth or other material to be sewed, and having so held in relation with, but not in contact with it, by a novel contrivance, a bobbin, or its equivalent, carrying another thread, that the said hoop will extend the loop of the first-mentioned thread, and pass it over the said bobbin, or equivalent, in such manner as to cause the thread therefrom to be received within them, and afterward draw back the loops into or against the cloth, thereby producing what is commonly known as the lock-stitch, such as is made by an ordinary shuttle sewing machine. The invention further consists in an improvement in the four-motion feed of sewing machines, whereby its action is rendered noiseless.

To enable others skilled in the art to make and use my invention, I will proceed to describe it with reference to the drawings, in which—

Figure 1 is a right-hand side view of a sewing machine with my improvements.

Figure 2 is a vertical section of the machine at right angles to fig. 1, taken in the plane of the axis of the rotating ring.

Figure 3 is a vertical section parallel with fig. 1, in the plane indicated by the line xx of fig. 2.

Figure 4 is a side view of the needle, the rotating hoop, the device by which the said hoop is supported, the bobbin, and part of the contrivance for supporting and holding the bobbin, showing the needle and rotating hoop in a position different from fig. 1.

Figure 5 is a side view, representing the same parts as fig. 4, but with the needle and rotating hoop in another position.

Figure 6 is a side or outer face view of the rotating hoop.

Figure 7 is an edge view of the same.

Figure 8 is a back view of the same.

Figure 9 is a section of the bobbin, and the contrivance for holding the bobbin in place in the planes indicated by the line yy in fig. 4.

Figure 10 is a face view of that part of the frame or bed-piece of the machine against which the rotating hoop works.

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

A is the frame or bed-piece of the machine; B is the cloth-plate, on which the work is laid; C is the horizontal rotating mandrel, from which the movements of the several operating members of the machine are derived; D is the stationary arm, to which the presser E is attached; n is the needle. These parts are represented as arranged substantially like those of what is known as the Wheeler & Wilson sewing machine, but may be arranged in any other suitable manner that may suggest itself to persons familiar with the construction of sewing machines. The machine may be furnished with any of the well-known or any other suitable devices for producing the necessary friction upon, and tension of, the needle-thread. The right-hand end of the mandrel C has formed upon, or otherwise rigidly attached to it, a flange or disk, C' , the outer face of which is countersunk a short distance within the corresponding side of the frame A, as shown in fig. 2; and on the outer face of this flange or disk there is a projecting tongue, a , having a rounded point for the purpose of driving the rotating hoop F, by which the loops of the needle-thread, (represented of red color,) are extended and passed over the bobbin G, which carries and supplies the locking thread, represented of blue color. The rotating hoop F consists of a circular hoop of steel, the internal diameter of which is considerably larger than the internal diameter of the heads of the bobbin G, as shown in figs. 2, 4, and 5. One face of the said hoop is flat and perpendicular to its axis, that it may lie and rotate against the flat, upright surface of the exterior of the right-hand side of the frame A, below the plate B, and the opposite face is rounded, as shown in the section, fig. 2. At one point in its circumference the said hoop has an opening, d , on one side of which it is

tapered to a point, *b*, of suitable form to enter easily into the loops of the needle-thread, the said point terminating in the plane of its flat inner face, as shown in fig. 7; and, at the other side of the said opening, it is tapered or rounded, as shown at *c* in fig. 7, on its inner face, in such manner as to allow the loop to slide freely off it. At a short distance from the point *b*, and on the same side of the opening, a notch, *f*, is made in its inner circumference, of such form as to produce a hook, *e*, for the purpose of catching and extending the loop, and carrying it over the bobbin *G*. Between this notch *f* and the point there is a recess, *g*, (shown best in fig. 8,) in the inner face of the hoop, forming a bearing, *h*, against which the projecting tongue *a* of the mandrel *C* presses to produce the rotation of the hoop by and with the rotation of the mandrel, which rotates once during every complete movement of the needle. *H* is the device which may be termed the hoop-holder, by which the hoop *F* is supported and held in place, consisting of a small frame, which is held by screws, *I* and *J*, firmly against the flat, vertical outer surface of the frame *A*. In this frame there is a circular opening, of diameter smaller than that of the exterior of the hoop *F*. This opening is countersunk on the inner side of the said frame *H*, of such form that the hoop may lie or rotate so loosely within it that the loop of the needle-thread may pass freely over it, one side of the said loop passing between the hoop and the said frame *H*, and the other side of the said loop passing between the loop and the face of the main frame *A*. The said frame *H* is so arranged as to keep the hoop concentric with the mandrel *C*. In the top of the said frame *H* there is a taper opening, *i*, right through it for the passage of the loops and of the locking thread from the bobbin. Opposite to this opening, *i*, there is a groove, *j*, (figs. 2 and 10,) in the main frame *A* for the passage of the needle and its thread, the needle passing through this groove close behind the rotating hoop *F*. On one side of this groove there is a shallower recess, *l*, (fig. 10,) for the free passage of the inner portion of the loop of the needle-thread as the said loop is extended and carried over the bobbin *G* by the rotating hoop. The bobbin *G* is of metal or other suitable material, and in form somewhat like that used in the Wheeler & Wilson sewing machine, but may be much thicker in the direction of its axis, so as to hold more thread. It is held so loosely between two rings, *K* and *L*, that the loops of the needle-thread may pass freely over it, between it and the said rings, its position being within and concentric, or nearly so, with the rotating hoop, but slightly oblique to the plane of rotation of the said hoop, as shown in figs. 2 and 3, to facilitate the passage of the loop over it. The rings *K* and *L* are attached one to each of the two arms *K'* and *L'*, which are secured to the main frame *A* outside of the hoop-holder *F* by the same two screws *I* and *J* which hold the hoop-holder in place. The arm *K'* of the ring *K* is set in squarely, or nearly so, at the junction of the ring, as shown at *k* in fig. 9, to enable the ring to be set back in its proper place within the rotating hoop; and the bobbin is supported partly by this set-in part *k* of the arm, and partly by a slight fullness or swell on the inner faces of the rings, about opposite the letter *m* in figs. 1, 4, and 5; the exteriors of the heads of the bobbin being slightly convex, and thereby preventing it from slipping out between the swell on the rings.

I will now describe the combined operations of the rotating hoop *F*, the needle, and the bobbin *G* in sewing. To commence the operation, the needle is threaded, and the end of the thread from the bobbin is drawn off far enough to enable it to pass a short distance through the needle-hole in the plate *B*, and held between the finger and thumb, or otherwise suitably secured, until the first stitch is made. The machine being now set in operation, the needle carries the thread through the cloth in the form of a loop in the usual manner, and after it has completed its downward movement, and risen far enough to throw out the outer side of the loop of its thread, the rotation of the hoop in the direction of its point, *b*, indicated by an arrow in figs. 2, 4, and 5, carries the said point between the needle and the thrown-out part of the loop, as shown in fig. 1; and as the rotation of the hoop proceeds while the needle rises, the hook *e* catching the loop, as shown in fig. 4, extends it over the hoop and carries it over the bobbin, as indicated in fig. 5, one side of the loop passing over the inner side of the hoop and bobbin, and the other over the outer side of the hoop and bobbin. By the time the hook has passed the lowest point of the bobbin, and carried the loop past the centre thereof, as shown in fig. 5, the needle has again descended so far that its eye is about entering the cloth, and as the descent of the needle and rotation of the hoop continue, the doubling of the thread and formation of a new loop below the cloth causes the old or first-mentioned loop to be drawn off the hook *e*. In the further continued rotation of the hoop, its point approaching the needle, passes behind or inside of the inner side of the old loop before entering the new one, and, as the new loop is extended by the hook *e*, the thread to produce such extension is drawn from the old loop, which is thereby drawn up through the opening *d* of the hoop to the under side of the cloth, bringing with it the locking thread which it has received within it in slipping off the bobbin *G*. Every succeeding rotation of the hoop and movement of the needle produces a repetition of the above-described operation, and with a proper feed movement of the cloth produces a stitch. One peculiarity in the operation of this rotating hoop, as compared with the rotating hook of Wheeler & Wilson and the various rotating rings employed in sewing machines, is that it passes completely through the loop like a shuttle, its point entering the loop, and the loop slipping off at the opposite end or heel *e*, and hence it does not twist the loop like the hook or rings of those machines. Another peculiarity is that it does not spread the loop so much as the rotating hook, and hence there is not so much thread to take up, and the thread is consequently subject to less friction. Another peculiarity is that it requires no adjustable loop-check; and, finally, it differs from the rotating hook in working entirely free of the bobbin, and consequently produces no friction thereon; and, finally, the said bobbin may be made so much thicker than that of the Wheeler & Wilson machine that it may contain much more thread. To obviate the necessity for the person using the sewing machine to wind the thread upon the bobbin *G* it may be made of two parts, as shown in Figure 11, which may be unscrewed and taken apart to be used as a spool case for the reception of a spool, *G'*, of paper or other thin and light material, upon which the thread may be put up and sold ready for use.

The feeding device consists of a longitudinally sliding feed-bar, M, and an attached rising and falling dog, N, constructed and applied substantially like those of the four-motion feed of the Wheeler & Wilson machine; but instead of the longitudinal movement of the said bar and dog, and the rising movement of the dog, being produced by one cam, the rising movement of the dog is produced by a cam, Q, (figs. 2 and 3,) upon the mandrel C in the usual position; and the longitudinal feeding movement of the bar and dog is produced by a cam, P, on the further or left-hand end of the mandrel. This cam, P, is made of hollow, cylindrical form, and fitted to the exterior of a circular, flat-sided collar, R, arranged concentrically upon, and fastened rigidly to the mandrel outside of the frame A. The operating portion of this cam, P, is an offset, p , on the side face which is toward the frame A, and which projects, as shown in fig. 2, beyond the corresponding face of the collar R, the said offset acting against a projection, q , on the under side of the feed-bar M, and the corresponding face of the collar R constituting the stop to the backward movement of the feed-bar, produced by a spring, S, attached to the frame A. A spiral spring, r , is applied around the mandrel within the cam P, and between the back of the collar R and the back of the said cam, to press back the cam against an adjusting nut, T, which is fitted to a screw-thread, t , on the mandrel for the purpose of adjusting the length of feed, which depends on the distance which the offset p of the cam projects beyond the face of the collar R, the said distance being increased by screwing up the nut, and *vice versa*. After the feed-bar has been moved forward from its stop, R, by the action of the offset p of the cam upon the projection q on the said bar, the said projection, whatever the distance the offset projects beyond the face of the stop R, slides back easily over the receding slope of the back of the offset until it comes into contact with the face of the stop, and hence meets the stop without any concussion, and consequently without noise.

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

1. The hoop F, constructed with an opening d , a point b on one side of the said opening, and a hook e on its inner circumference, and driven by a tongue or projection a on the rotating mandrel of the sewing machine, all substantially as herein specified.

2. In combination with a rotating hoop, constructed and operating substantially as hereinbefore specified, a bobbin, so held within, but out of contact with the said hoop, as to be confined in the direction of its axis, but to be capable of free rotation, substantially as herein specified.

3. The holding device by which the bobbin is held within, and in proper relation to, but out of contact with, the rotating hoop, consisting of the two rings K and L, one of which has an offset k for the partial support of the bobbin, substantially as herein specified.

4. The arrangement of the adjustable feed cam P, stop-collar R, spring t , and nut T, the whole applied to the rotating mandrel C, or its equivalent, substantially as herein set forth.

JAMES S. McCURDY.

Witnesses:

SAM. L. HARRIS,
HENRY T. BROWN.