

C. NECKER
Sewing-Machine.

No. 208,259.

Patented Sept. 24, 1878.

Fig. 4.

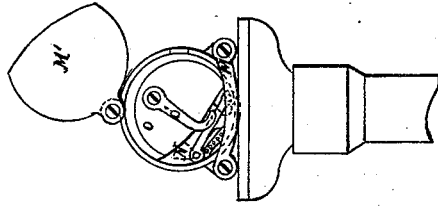
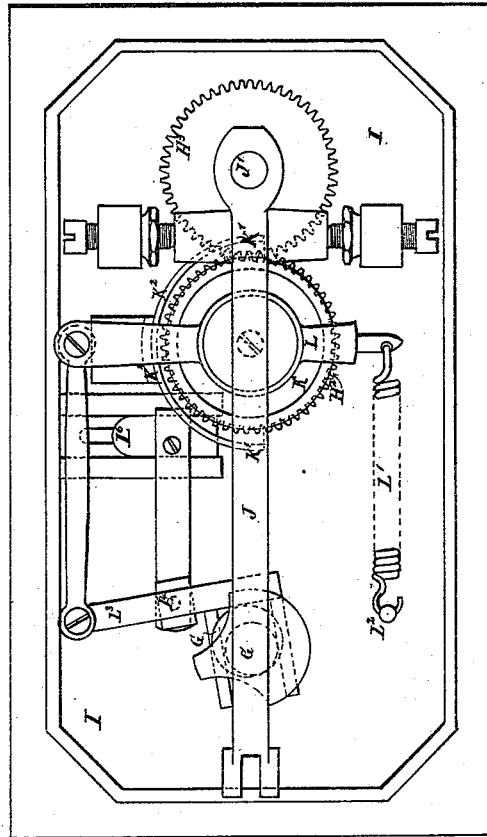


Fig. 3.



Witness
Wm. H. Graham
Wm. C. Keeser.

Inventor;
Carl Necker,
by *Johnson & Philipp*
Attys.

UNITED STATES PATENT OFFICE.

CARL NECKER, OF BERLIN, PRUSSIA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **208,259**, dated September 24, 1878; application filed May 7, 1878; patented in England, February 28, 1877.

To all whom it may concern:

Be it known that I, CARL NECKER, of Berlin, Prussia, have invented an Improvement in Sewing-Machines, of which the following is a specification:

This invention has for its object improvements in sewing-machines, and the improvements have reference to sewing-machines in which the fabric to be sewed is nipped and held between the circumference of two horizontal cylinders, which are pressed together, and are mounted at some distance above the bed of the machine. The needle by which the fabric is pierced is, as heretofore, a horizontal needle, and is worked to and fro radially to the axis of the cylinders and over the point at which the cylinders meet together. It is carried by an arm from a slide, to which a horizontal to-and-fro motion is given from a crank-disk, the pin of which operates in a slotted cam. I make the arm of a curved form, to pass over and clear the feeding-cylinder nearest to the cam-axis, and so as to come over the top of the outer feeding-cylinder. The needle is secured to the end of the said arm with its point toward the cam-axis, so that the needle pierces the fabric as it moves in a direction toward this axis.

To secure the loops of the thread passed through the fabric by the horizontal needle, another thread is passed through the loops by a shuttle. I cause the shuttle to oscillate to and fro in a circular race, situated above one of the cylinders which is nearest to the cam-shaft, and which race has its face close up to the point where the two cylinders meet.

The shuttle-race is in a vertical plane, and the shuttle-driver is carried by a horizontal axis, to which a revolving oscillating motion is imparted from the cam-shaft. The axis may for this purpose have a pinion upon its rear end, gearing with a curved toothed rack, carried by a horizontal arm, which is caused to rock to and fro by a cam or eccentric on the cam-axis, the cam-axis in this case being placed vertically.

The vertical stems of the two feeding-cylinders, for feeding forward the fabric, both pass down through the bed of the machine, and upon the lower end of each is a toothed wheel.

The two toothed wheels gear together, so that if one spindle is turned the other turns with it, whereby both cylinders aid to feed the fabric forward.

A step-by-step revolving motion is given to one of the spindles by a ratchet acting upon a wheel on its lower end, the ratchet being actuated from a cam or eccentric on the cam or driving shaft before mentioned.

The lower end of the spindle of one of the cylinders (the outer one) is carried by the end of a lever below the bed of the machine. A spring acts upon this lever to turn it in a direction to force the cylinder which it carries up to and against the other cylinder, the axis of which turns in fixed bearings. The lever is connected to a treadle, so that by depressing the treadle the movable cylinder may be moved away from the other cylinder and the cylinders be so caused to release their hold of the work.

In place of securing the loops of threads passed through the fabric by the straight needle, by interlacing with them loops of another thread by means of a shuttle, as above described, they may be secured by passing another thread through them by a curved needle. In this case loops of another thread are passed through and interlaced with them by a curved needle, which has an oscillating revolving motion given to it, as is well understood; but in place of this curved needle being upon a spindle at right angles to the straight needle, as is usual in other classes of sewing-machines, it is upon a spindle parallel with it. This spindle lies above the top of the cylinder nearest to the cam-axis.

To give motion to the spindle, I form its rear end with a spiral twist, which is embraced by a nut upon the slide of the straight needle, so that as this slide moves to and fro in a straight line an oscillating revolving motion is given to the axis of the curved needle.

Having thus described the nature of my invention, I will proceed to describe more fully the manner of performing the same.

In the drawings hereunto annexed I have shown a shuttle sewing-machine arranged as hereinbefore described.

Figure 1 is a side view of the machine, with

the cover-plate of its left-hand portion removed. Fig. 2 is a plan view of the same, with the top cover of the same portion of the machine removed. Fig. 3 is an under-side view of the machine; and Fig. 4 is a front view of a portion of the same.

In these figures, A is the driving-axis, which may be driven by a cord from an axis worked by a treadle, or may be otherwise driven. This axis gives motion, through bevel-toothed wheels, to an upright axis, B, from which motion is given to the several parts of the machine. On its upper end it carries a crank-disk, the pin C of which enters a slotted cam, D', attached to a slide, D, that carries the needle. It also carries an eccentric, E', (see Fig. 2,) which gives a to-and-fro motion to a toothed arc, E, carried by arms, between which the eccentric works, and which turn on a pin at E².

The toothed arc E gives a to-and-fro motion to a pinion, E', on an axis, F, which, at its opposite end, carries the shuttle-driver. On the lower end of the axis B is an eccentric, G, for giving a step-by-step motion to the feeding-cylinders, as hereinafter described.

H H¹ are the two feeding-cylinders, between which the work is nipped and held, and which move the work forward step by step as the stitching progresses. The stem of the cylinder H, which is nearest to the axis B, is carried down through the bed-plate I of the machine, and has upon it, below the bed-plate, a toothed wheel, H², which gears with a toothed wheel, H³, on the stem of the cylinder H¹, so that when one cylinder is revolved the other revolves with it.

The stem of the cylinder H¹ is hollow, and is free to turn upon a rod, J¹, fixed in the shorter arm of the lever J. The longer arm of this lever has bearing upon it a rod, J², pressed downward by a spring, J³, so that the cylinder H¹ is constantly pressed toward the cylinder H. The longer arm has also connected to it a rod, J⁴, which descends to a treadle, by which it can be raised, and when raised it turns the lever J on its fulcrum J⁵, and so moves the cylinder H¹ away from the cylinder H whenever it is desired to set the work free, the slot in the bed-plate I, through which the stem of the cylinder H¹ descends, being sufficiently large to allow the stem to be thus rocked to and fro. On the lower end of the stem of the cylinder H is a disk, K, against the circumference of which rests a portion of the ratchet-lever L, which turns loosely around the stem.

The end of the lever which bears upon the circumference of the disk K has connected to it a spring, L¹, which draws it constantly toward a fixed pin, L², to which the opposite end of the spring is connected. The opposite arm of the lever L is connected by a link to a rocking lever, L³, turning on a fulcrum at L⁴, and this lever is rocked by the eccentric G on the lower end of the axis B, as shown at Fig. 3.

By this means a rocking motion is given to the ratchet-lever L, and a step-by-step revolving motion to the stem of the cylinder H. The disk K has pads K¹, pressed against it by springs K², to impede it from moving during the backward motion of the ratchet-lever, but which allows it to turn on the forward movement of the lever, when it grips against the circumference of the disk, as is well understood.

The amount of movement given to the cylinder H at each revolution of the eccentric G can be varied by moving the fulcrum of the rocking lever L³ nearer to or farther from the eccentric. It is for this purpose mounted on a slide, L⁶, carried by the bed-plate, and which can be fixed in any desired position by a set-screw, L⁷. (Shown at Fig. 2.)

The above ratchet arrangement for giving a step-by-step movement to the stem of the cylinder H is what is known as a "smooth" or "silent" ratchet; but other ratchet arrangements might be used.

The slide D, which carries the needle, passes, as shown, above the top of the cylinder H, and at its end passes downward, and carries a horizontal needle just above the top of the cylinder H¹. Its pointed end, which carries a thread, as usual, works to and fro over the point where the cylinders H H¹ meet together, and as it passes over the cylinder H it enters a small hole formed in the front fixed portion of the circular shuttle-race M. (See Fig. 4.)

The shuttle N, carrying the second thread, lies in the shuttle-race, and is rocked to and fro in this race by a shuttle-driver, O, on the axis F, to which a to-and-fro revolving motion is given, as hereinbefore described.

The front face of the shuttle-race M is inclosed by a movable plate, M¹, which can be turned aside, as shown at Fig. 4, for the purpose of removing the shuttle. O' is a small spring on the shuttle-driver O, to bear against the front of the shuttle. The thread for the horizontal needle passes from the bobbin P, to which any ordinary friction arrangement is applied, and through an eye, P¹, to an eye in a rocking arm, P², which is by a spring moved backward as the needle moves forward, so as to take up slack thread. The thread also, for the same purpose, passes through a slotted rod, P³, and rests upon a cap, P⁴, pressed upward by a spring around the slotted rod, as shown at Fig. 1. It then passes through eyes P⁵ on the needle-arm to the needle.

As before stated, a second thread may be passed through and interlaced with the loops of the straight horizontal needle by means of a curved needle, which has an oscillating revolving motion given to it, as hereinbefore described, in place of passing a thread through the loops of the thread of the straight needle by a shuttle, as above more particularly described.

Having thus described the nature of my invention and the manner of performing the same, I would have it understood that the de-

tails of the machine hereinbefore described and shown in the drawings may be considerably varied; but

What I claim is—

1. The combination of the reciprocating arm carrying the straight needle, the feeding-cylinders H H', and the shuttle O' or its described equivalent, the said needle being carried above the cylinder H' farthest from the cam-axis and moving toward this axis in its forward movement, as hereinbefore described.

2. The combination, with the feeding-cylinders H and H', of a shuttle - race arranged over one of said feeding-cylinders and near their point of meeting, substantially as described.

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

CARL NECKER.

Witnesses:

OTHMAR LENZ,
EDWARD P. MACLEAN.