(No Model.) 2 Sheets—Sheet 1.

W. F. DIAL.

SEWING MACHINE.

No. 446,830. Patented Feb. 17, 1891.

Fig. 1.

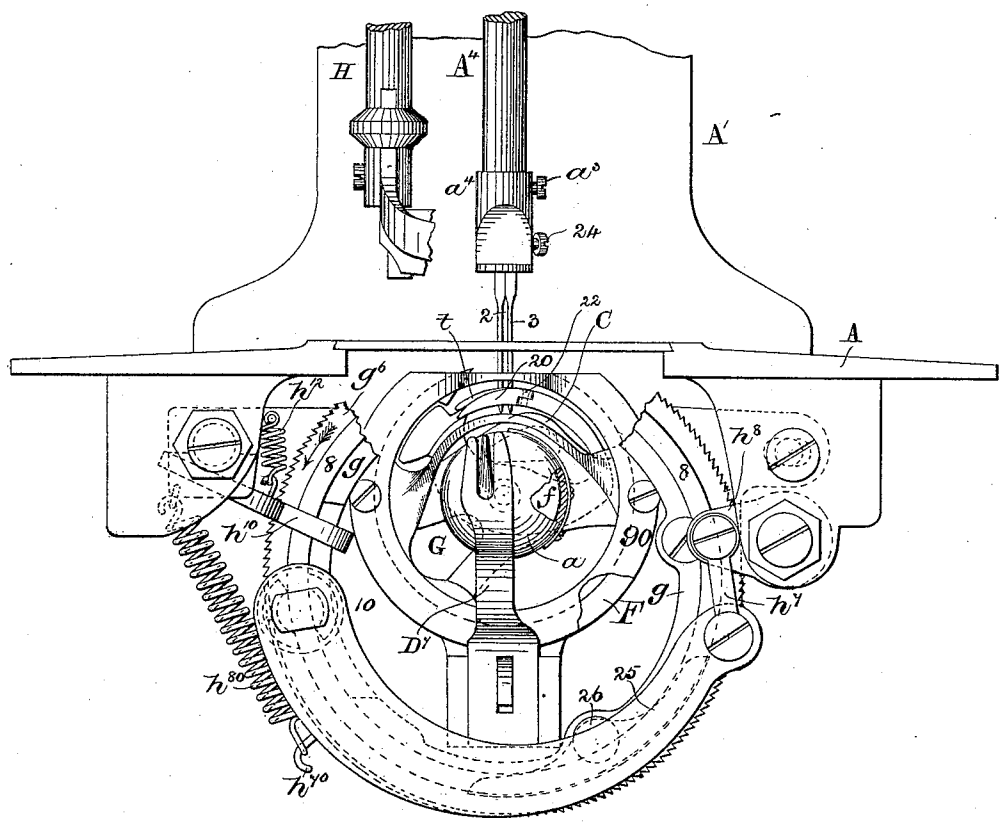


Fig. 2.

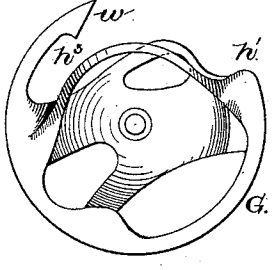
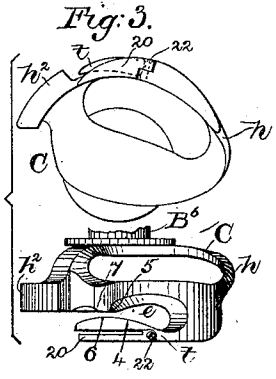


Fig. 3.



Witnesses:
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Frederick L. Emery

Inventor:
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by Crosby & Gregory
Attys.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

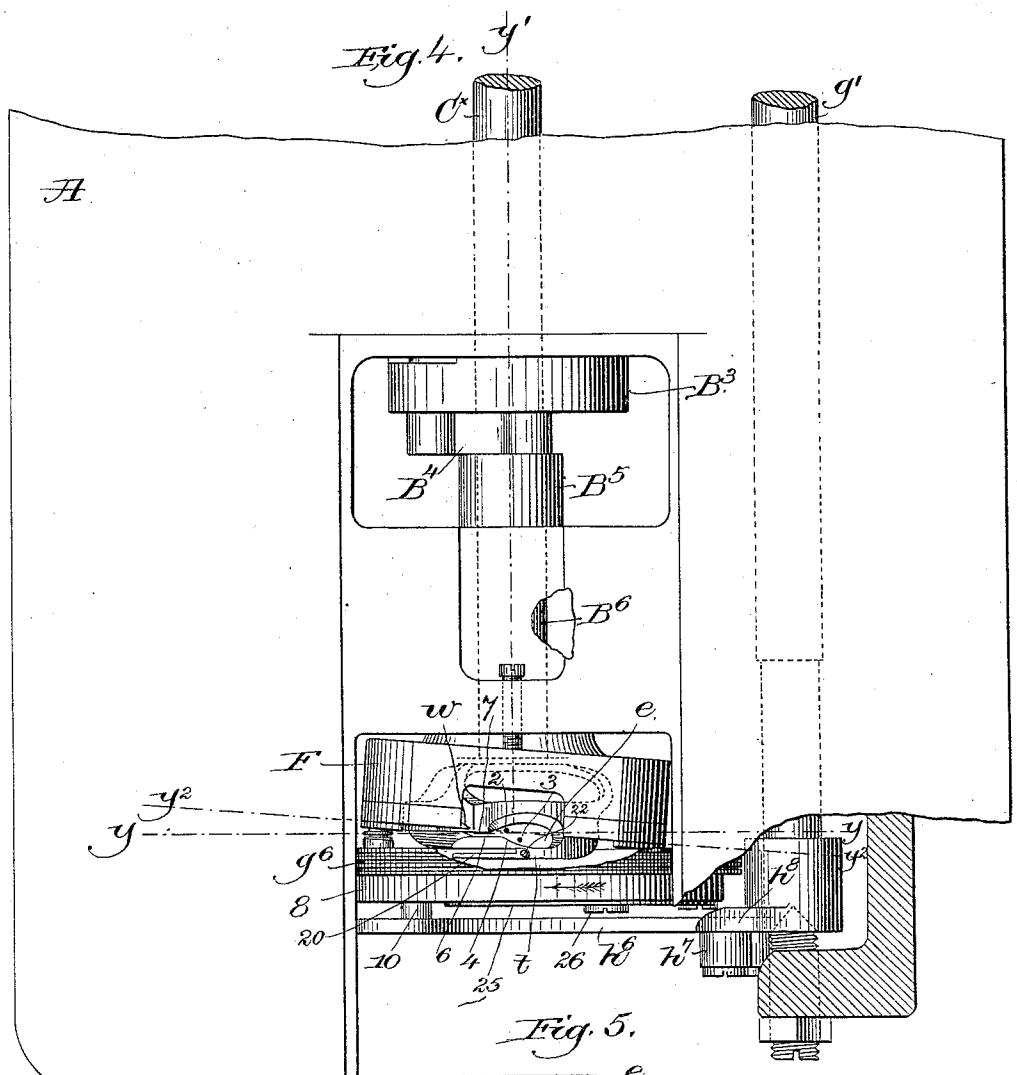
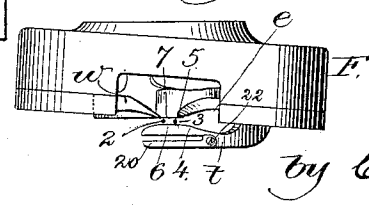


Fig. 5.



Witnesses.
Edgar A. Goddin
Frederick L. Emery

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Wilbur F. Dial.
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UNITED STATES PATENT OFFICE.

WILBUR F. DIAL, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE WHEELER & WILSON MANUFACTURING COMPANY, OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 446,830, dated February 17, 1891.

Application filed January 8, 1890. Serial No. 336,275. (No model.)

To all whom it may concern:

Be it known that I, WILBUR F. DIAL, of Bridgeport, county of Fairfield, State of Connecticut, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

The invention relates to sewing-machines which are provided with two needles for sewing parallel seams.

The principle of the invention and the manner in which I have contemplated applying that principle will be described first, and then I will proceed particularly to point out and distinctly claim the part, improvement, or combination which I claim as my invention.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a partial end elevation below the bed-plate of a sufficient portion of a sewing-machine to enable the invention herein to be described to be understood, the figure showing part of the needle-bar, with its two needles, and part of the presser-bar, the presser-foot and devices common to the Wheeler & Wilson system of machine being omitted, the figure showing also a portion of the upright part of the usual overhanging arm. Fig. 2 shows the loop-taker detached. Fig. 3 shows in front elevation and plan view the loop-taker driver detached. Fig. 4 is a plan view of part of the bed of the machine with the usual cover-slides removed; Fig. 5, a detail of the loop-taker guide, loop-taker, and loop-taker driver in a different position.

The bed-plate A, having the upright A′ to support the usual overhanging arm containing the usual presser-bar H, the needle-bar A^4, and the main under shaft C*; the short shaft B^6 to actuate the loop-taker driver, to be described; the variable speed device between the said two shafts, it consisting, as shown, of the disk B^3, fast on the shaft C*, the arm B^5, fast on the shaft B^6, and the link B^4, connecting the said disk and arm; the bobbin-case *a*, and the holder D^7, to prevent it from rotating with the loop-taker G and the disk-bobbin *f* (shown in Fig. 1) by breaking out the bobbin-case, are and may be all as in the Wheeler & Wilson machine constructed substantially in accordance with United States Patent No. 328,165.

The needle-bar A^4 has connected to it by a screw a^3 a needle-holding block a^4, provided with two needles 2 3, set in a line diagonal both to the direction of the movement of the feed and to the center of the main shaft C*, (see Figs. 1 and 4,) so that the said needles may penetrate the material close to each other and enable the said two needles, each properly supplied with thread, to have their loops cast about the bobbin containing an under thread for the formation of parallel lines of lock-stitches. The needles are held in the holding-block a^4 each by its own screw 24.

As the needles 2 3 are set diagonally, as stated, the loop-taker G has to be rotated in a vertical plane oblique to the vertical plane intersecting the line of the feed and also oblique to the center line of the main shaft C*, and in order to enable the point *w* of the loop-taker to enter the loops of thread thrown out from the two needles I have shown the loop-taker as adapted to be moved in a guide F, the said guide being arranged to occupy a position in a vertical plane oblique to a horizontal line drawn at right angles to the center line of the main shaft C* (best shown in Fig. 4) and also oblique to a horizontal line drawn longitudinally through the feed.

The loop-taker driver C has a projection *h* to engage the heel *h′* of the loop-taker, and an engaging device h^2 to enter the space h^3 back of the point *w* of the loop-taker, (see Fig. 2,) as in said patent, and in order to insure the placing of one or both needles in the oblique line in which the point of the loop-taker travels the said driver has been provided with an outwardly-extended finger *t*, shaped to leave a space *e* in advance of the point *w* of the loop-taker in the direction of its rotation and when the point *w* is about to enter the loops of thread of the two needles 2 3, (the said needles after passing below the usual throat-plate entering said space and

then rising to throw out loops of their thread in usual manner,) the said loops being entered by the point of the loop-taker.

Viewing Fig. 4 it will be seen that the two needles 2 3 are set diagonally with relation not only to the line $y\ y$ parallel to the line of feed movement, but also to the line y', which designates the center of the shaft C*.

The loop-taker G has a circular movement in a vertical plane oblique to the horizontal line $y^2\ y^2$, drawn at right angles to the main shaft C*, and also oblique to the horizontal line $y\ y$, drawn parallel to the longitudinal center of the usual feeding device, the oblique plane in which the loop-taker moves being designated by the horizontal line $y^2\ y^2$.

The needles 2 and 3 are shown as set at opposite sides of the line $y^2\ y^2$, and hence the loop-taker, moving in a vertical plane designated by the horizontal oblique line $y^2\ y^2$, would not enter the loops of thread carried by the said needle, and to place these needles in the said oblique line the finger t has been provided with a cam-surface 4 and the driver with a cam-surface 5, said surfaces pushing or deflecting the needles from the position Fig. 4 into the position shown in Fig. 5, both needles being acted upon between their points and eyes, so as not to chafe or break the needle-thread, the said needles being guided or positioned by the substantially parallel walls 6 7 as the point w of the loop-taker enters the loops of thread carried by the said needles. The lines of stitching at the surface of the fabric are parallel, but close together.

The bed of the machine at its under side has suitable lugs to sustain an annular curb g, which serves as a bearing for the feed device g^6, herein shown as a toothed ring having an annular rib 8, which is engaged by a forked stud 10 on a curved arm h^6, one end of which is jointed by link h^7 to an arm h^8 of a rock-shaft g', used to actuate the feed. The arm h^6 near its other end has a stud h^{70}, to which is connected a spring h^{80}, attached at its other end to a fixed part of the machine. As the arm h^6 is lifted by the link h^7 the forked stud 10 is made to grasp the rib 8, and in the further rise of the link h^7 the arm h^6 is moved longitudinally and takes the feed-wheel with it in the direction of the arrow thereon to effect the feeding of the material in the line $y\ y$ at right angles to the line y'. The spring h^{80} draws the arm h^6 back and slides the dog or stud 10 on the rim 8 as the link h^7 is lowered, the notched dog or detent h^{10}, acted upon by the spring h^{12} at such time, aiding in preventing any retrograde movement of the feeding device g^6.

Instead of the feeding device g^6, (shown as a wheel,) I may use the feeding device shown in the said patent. A flat spring 25 (shown in dotted lines, Fig. 1) is attached by a screw 26 to the curb g and bears on the ring g^6 to prevent any overthrow movement of the ring.

To co-operate with the wheel-like feeding device, the presser-bar is herein shown as having a roller pressure r of usual construction; but instead I might use any other usual form of presser, especially if the feeding device was a bar having four motions.

Believing the machine herein described to be the first devised to simultaneously stitch parallel lock-stitch seams by the use of two needles set diagonally, as described, in one needle-bar and by one loop-taker rotated in a vertical plane oblique to a horizontal line drawn parallel to the longitudinal center of the feed and to a horizontal line drawn at right angles to the main shaft, the said loop-taker casting both loops of needle-thread about one bobbin, the invention herein contained is not to be limited to the exact form of loop-taker to enter the loops of needle-thread and cast them both about a bobbin containing the under thread, nor to the exact means for moving the loop-taker in a circular path, nor to the exact construction of the loop-taker, as the invention will include any known equivalent. The finger t is shown as provided with a portion 20, it acting on the bobbin-thread between the bobbin and the under side of the work to draw from the bobbin sufficient thread for another stitch, the said portion being so constructed as to be adjustable toward or from the needle to adapt it to be turned or moved toward or from the needle to pull more or less thread from the bobbin according to the particular work to be done or width of seam. This part of my invention is not, however, limited to the particular means for effecting said adjustment.

I have herein shown the portion 20 as held in place by a clamp-screw 22.

I am aware prior to my invention that a sewing-machine having two needles arranged diagonally to the feed and having an oscillating shuttle working in a vertical plane parallel to the feed has been provided with a take-up to give up to one needle more thread than to the other needle, to thus make for that needle farthest from the shuttle a larger loop for the entrance of the shuttle, and so, also, I am aware that a sewing-machine has been made having its shuttle tipped over sidewise at the top to occupy a diagonal position with relation to a vertical plane, as in United States Patent No. 98,390; but neither of the machines shown in the said patents nor both of the machines taken together show the features herein made the subject of claim.

I claim—

1. In a sewing-machine for simultaneously sewing parallel seams, the following instrumentalities, viz: a needle-bar containing two eye-pointed needles set in a line diagonally with relation to the feed and to the length of the main shaft of the machine, means to move the needle-bar, a take-up for the threads carried by the said needles, a loop-taker, a loop-taker guide arranged in a vertical plane oblique to a horizontal line drawn at right angles to the main shaft and to a horizontal line

drawn longitudinally through the feed, a bobbin and bobbin-case, a feeding device to feed the material at right angles to the main shaft, a main shaft, a loop-taker driver, and means to actuate the said loop-taker driver and loop-taker from the main shaft, whereby the loop-taker is moved in a circular path in a vertical plane oblique to a horizontal line drawn at right angles to the main shaft and to a horizontal line drawn longitudinally through the feed, substantially as described.

2. In a sewing-machine for simultaneously sewing parallel seams, the following instrumentalities, viz: a needle-bar containing two eye-pointed needles set in a line diagonally with relation to the feed and to the length of the main shaft of the machine, means to move the needle-bar, a take-up for the threads carried by the said needles, a loop-taker, a loop-taker guide arranged in a vertical plane oblique to a horizontal line drawn at right angles to the main shaft and to a horizontal line drawn longitudinally through the feed, a bobbin and bobbin-case, a feeding device to feed the material at right angles to the main shaft, a main shaft, a loop-taker driver, and means to actuate the said loop-taker driver at a variable speed from the main shaft, whereby the loop-taker is moved in a circular path in a vertical plane oblique to a horizontal line drawn at right angles to the main shaft and to a horizontal line drawn longitudinally through the feed, substantially as described.

3. In a sewing-machine for simultaneously sewing parallel seams, the following instrumentalities, viz: a needle-bar containing two eye-pointed needles set in a line diagonally with relation to the feed and to the length of the main shaft of the machine, means to move the needle-bar, a take-up for the threads carried by the said needles, a loop-taker, a loop-taker guide arranged in a vertical plane oblique to a horizontal line drawn at right angles to the main shaft and to a horizontal line drawn longitudinally through the feed, a bobbin and bobbin-case, a feeding device to feed the material at right angles to the main shaft, a main shaft, a loop-taker driver, a circularly-moving deflector to act upon and deflect one or both of said needles, as described, and means to actuate the said loop-taker driver and loop-taker from the main shaft, whereby the loop-taker is moved in a circular path in a vertical plane oblique to a horizontal line drawn at right angles to the main shaft and to a horizontal line drawn longitudinally through the feed, substantially as described.

4. The loop-taker, the loop-taker driver, and the bobbin-case, combined with the adjustable portion secured to the said driver and arranged to act on the bobbin-thread and pull from the bobbin a supply of bobbin-thread for the next stitch, substantially as described.

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

WILBUR F. DIAL.

Witnesses:
GEO. W. GREGORY,
B. DEWAR.