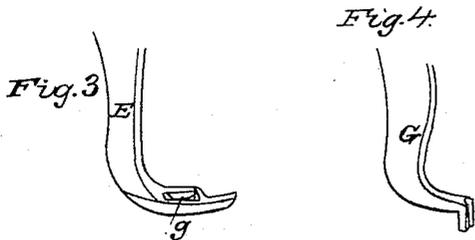
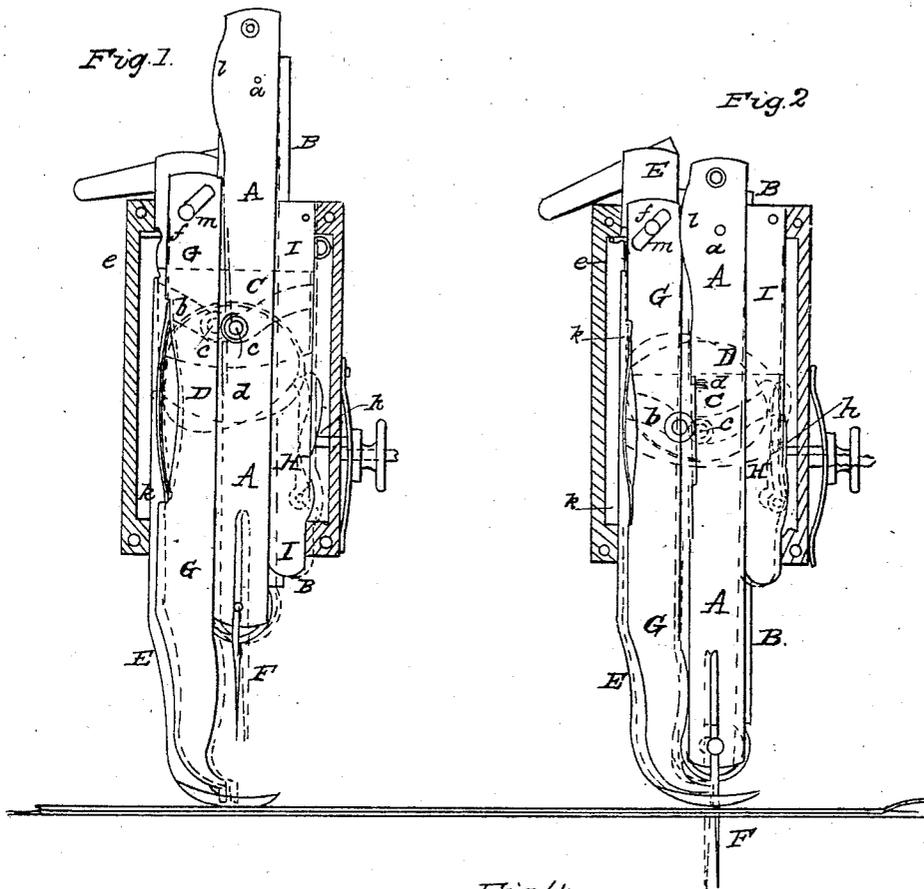


J. A. DAVIS.

Needle Feed of Sewing Machines.

No. 58,614.

Patented Oct. 9, 1866.



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IMPROVEMENT IN THE NEEDLE-FEEDS OF SEWING-MACHINES.

Specification forming part of Letters Patent No. 58,614, dated October 9, 1866.

To all whom it may concern:

Be it known that I, JOB A. DAVIS, of Great Bend, in the county of Susquehanna and State of Pennsylvania, have invented new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, and of their mode or manner of operation, reference being had to the accompanying drawings, and to the letters of reference marked thereon, and making a part of this specification.

My invention or improvements have relation to that class of sewing-machines which make use of a "needle-feed," so called, and consists in the application and use of a device which acts as an assistant or helper to the needle, and which keeps the fabric, while being sewed, smooth, and prevents its gathering or bunching as the feed is effected, and which also holds the fabric and prevents it rising as the needle is withdrawn.

Figure 1 shows the operating parts of the machine—those which form the stitch and produce the feed—as they are when the needle is at its highest position. Fig. 2 is a view of the position of the same parts when the needle is at its lowest position. Fig. 3 shows the construction of the foot of the pressure-bar. Fig. 4 shows the construction of the foot of the needle-helper bar.

A represents the needle-bar, which is suspended by the pin *a* from the plate B, which is placed behind the needle-bar, and to the back side of which is fixed the metallic piece C, which has in it a curved slot or groove, *b*, in which moves the roller *c*, attached to the irregular-shaped cam D. Such cam is revolved by means of a horizontal shaft, to which it is fixed by the pin *d*, which is one side of its center.

E is the pressure-bar, which is forced down upon the cloth by means of a spring, one end of which is shown at *e*, and such pressure-bar is so arranged and is operated so that at the time the feed of the cloth is effected or takes place, it (the bar) will be raised from the cloth, as shown in Fig. 2, and exert no downward pressure upon the cloth or interfere with the easy feed of it.

In front of and suspended from the pressure-bar E by the pin *f*, is the needle assistant or helper G, which is nearly the length of the

pressure-bar, and the foot of which is so shaped as to enter and pass through the recess *g* in the foot of such pressure-bar.

The plate B, that carries the needle-bar, and the pressure-bar E move vertically, and have no other motion; but the needle-bar A and its assistant or helper G have not only a vertical motion, but a lateral movement also, on the pins *a* and *f*. Such lateral motion of the needle-bar is necessary to produce the feed of the cloth, which is effected by the needle F, the needle and needle-bar being carried back again before the next stitch is made. Such lateral motion in one direction is caused by the point or end of the cam D coming in contact with the upper end of the lever H and forcing it back, and consequently moving the other end of such lever in an opposite direction, (such lever having its fulcrum on the end of the pin *h*.) as shown in Fig. 2. As such lever H is so acted upon it moves the lower end of the bar I, which carries with it the needle-bar A and its needle F, into the position indicated by the red lines in Fig. 2, such movement of the needle effecting or producing the feed of the machine. The needle-bar in such lateral movement also moves the lower end of the helper-bar G to the same extent. The needle-bar A and helper G retain such position during the entire ascent of the needle-bar, the cam during such time continually acting against the upper end of the lever H, and until just after the time when the needle-bar has been carried to its highest position, when the cam, or its projecting portion, passes away from the end of such lever, allowing the spring *k* to act and force the suspended bars G, A, and I into a vertical position, as shown by the red lines in Fig. 1.

When the needle-bar first reaches its highest position the cam D is in the position shown by the dotted black lines in Fig. 1—that is, pressing against the upper end of the lever H, and causing such lever to take the position shown by dotted black lines in the same figure. At such time, also, the lever-bar I, the needle-bar A, and the helper-bar G are in the positions represented by the shaded or black lines in Fig. 1—that is, their lower ends are inclined from a perpendicular equal to the length of the stitch or the extent of the feed. The next onward movement of the cam D carries its

point *o*, as before mentioned, beyond the end of the lever *H*, so as to no longer act against it, and thereby permitting the spring *k* to move the lower ends of the bars *G*, *A*, and *I* into a vertical position, or into the position indicated by the red lines in Fig. 1.

At this time also the foot of the pressure-bar *E* is resting on the cloth; but the foot of the needle-helper *G* does not touch the cloth, being lifted above it, as shown in Fig. 1.

The further revolution of the cam *D* by the action of the roller *c* in the groove *b* carries down the plate *B*, and with it the needle-bar *A*. As the needle, however, descends the cam does not act upon the lever *H*, but the spring *k* keeps the needle-bar in a vertical position until it has reached its lowest position. The needle thus enters the cloth vertically. As such bar, however, descends its projecting or curved side *l* is brought in contact with and presses against the upper end of the bar *G*, forcing such bar outward and downward, (by means of the slot *m* and the pin *f*, on which it moves,) until the foot of the bar *G* is forced down upon the cloth. As the needle-bar still further descends it continues to act upon or against the upper end of the bar *G*; but as that bar cannot descend any farther the pressure-bar *E* (through the action of the slot *m* and pin *f*) is made to rise until, when the needle-bar has completed its descent, the foot of the pressure-bar is wholly raised from the cloth, and the foot of such bar and of the bar *G* are in the relative positions indicated by the shaded or black lines in Fig. 2—that is, the foot of the bar *G* rests upon the cloth and the foot of the pressure-bar *E* is lifted from it; at which time, also, the cam *D* is in the position indicated by the dotted black lines in Fig. 2—that is, just ready to act upon and move the lever *H*.

The further revolution of the cam causes it to come in contact with the upper end of the lever *H*, and presses it outward against the pin *h*, thereby forcing its lower end in an opposite direction, and moving the needle-bar and needle to the position shown in red lines in Fig. 2, thus effecting the feed, and at the same time, also, moving or pressing back the helper *G*, the foot of which, resting on the cloth, keeps it smooth and prevents it gathering or bunching while the feed is produced.

It will be observed that at the time the feed is effected the foot of the pressure-bar does not touch or rest upon the cloth, but that such cloth is free to move with the needle and its

helper *G*, and that as the needle-bar ascends the helper *G* does not change position, but remains upon the cloth and holds it while the needle is being withdrawn until the cam *l* on the needle-bar passes above the end of the bar *G*, when such bar rises and the pressure-bar falls, and such bars take the relative positions shown in Fig. 1. The foot of the pressure-bar *E* and of the needle-helper *G* are thus never resting on the cloth at the same time; but the one rises from the cloth as the other descends upon it.

By the use of the helper-bar *G*, acting as described, in combination with the needle, the thinnest fabrics can be sewed as easily as a thicker and stiffer one, and even a single thickness of the most delicate and thin muslin can be stitched without its being gathered or puckered by the thread in the slightest degree and without the necessity of applying the hand to assist the movement or feed of the cloth. Cloth folded bias can also be sewed as conveniently as when folded with the thread and retain all its usual elasticity.

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

1. In sewing-machines using a needle-feed, the application and use, in combination with the needle-bar and needle, of the needle, assistant, or helper-bar *G*, for keeping the cloth smooth and preventing its gathering or bunching as the feed takes place, such bar being placed before the needle and so arranged as to move up and down upon its fulcrum, and operating substantially as and for the purposes set forth.

2. The combination of such helper-bar with the pressure-bar, so arranged in respect to each other that as one descends the other rises, and vice versa, and operating substantially as and for the purposes set forth.

3. The arrangement of the slot *m* in the helper-bar and the pin *f* upon the pressure-bar, or their equivalent, so that the descent of the needle-bar or its equivalent will force down the helper-bar and elevate the pressure-bar, substantially as and for the purposes set forth.

4. Operating the helper and pressure bars, substantially as described, from or by means of the needle-bar or its equivalent, substantially as and for the purposes set forth.

JOB A. DAVIS.

Witnesses:

EZEKIEL BOOTH,
JAMES A. AMES.