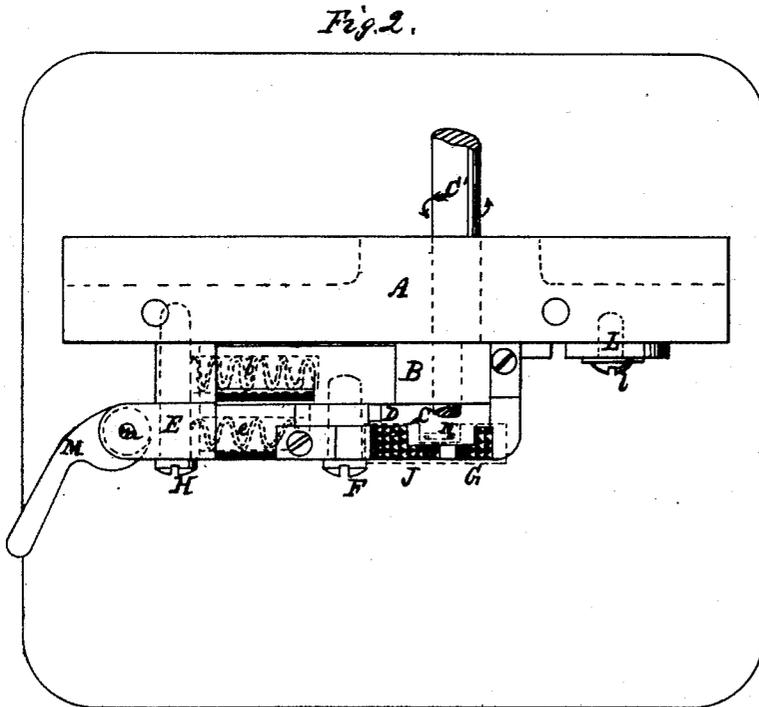
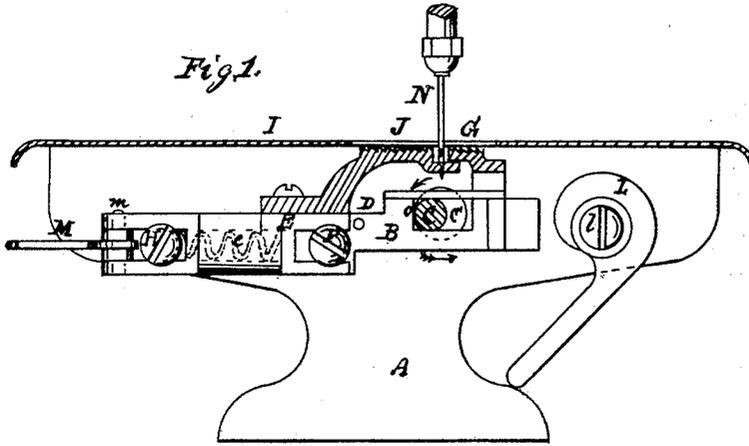


G. B. ARNOLD.
SEWING MACHINE.

No. 28,139.

Patented May 8, 1860.



Witnesses

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IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 28,139, dated May 8, 1860.

To all whom it may concern:

Be it known that I, GEO. B. ARNOLD, of the city, county, and State of New York, have invented a new and useful Improvement in Sewing-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

In the manufacture of many garments, such as ladies' and children's dresses and undergarments and gentlemen's shirts, drawers, &c., it is necessary to sew one piece of cloth gathered up in small even folds or corrugations to another piece of cloth not so gathered, and until my improvement, herein described, I am aware of no machine that has done this. The practice has been to run a thread or threads, either by hand or with a machine, the whole length of the cloth to be gathered, and then by hand to draw up said cloth to the desired fullness, and after this to sew the same, either by hand or with a machine, to the cloth not gathered, thus securing the gathers and making the seam. This is a tedious operation. By my invention I am enabled to take two pieces of cloth of unequal length, and placing their edges together with the longer piece at the bottom, and by running them through the machine not only to gather the bottom cloth to any desired degree of fullness, but to sew them firmly together at the same time.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation, by the aid of the accompanying drawings, in which—

Figure 1 is a vertical section of my invention, with a sufficient portion of a sewing-machine to illustrate its operation; and Fig. 2 is a plan view of the same with the plate (which is indicated by red lines) removed.

Similar letters indicate like parts in both figures.

A is that portion of a "Gibbs" sewing-machine which supports the cloth-plate I.

N is the needle, and C' the shaft through which the various motions of the machine are communicated.

C is an eccentric or cam on the end of C', which gives motion to the feeding device, and to which is attached the looping-hook. (Not shown in the drawings, as it forms no part of my invention.)

B is a slide, so attached to the standard A

by the pin H that it is free to slide thereon in the direction of its length, and also to turn around the pin H. There is an opening made through B, in which the eccentric-pin C operates. This opening is of a width which nearly fits the eccentric C; but its length is such that C can play therein, giving B but little or no motion in the direction of its length. The other end of B is hollow, and a spiral spring, *b*, is inserted therein, which presses against the pin H and tends to force B toward the eccentric C and keep it in contact therewith at the point *o*. A cam, L, upon A regulates the distance to which B can move in that direction. To B is attached a roughened piece, G; which passes through a slot in the plate I at a point in front of the needle N, when the slide B is raised by the eccentric C, and feeds along the cloth placed thereon to the full extent of the motion of B.

So far the parts correspond with the usual feed-motion of the kind of machine represented.

By the side of B, I place a somewhat similar slide, E, turning also upon the pin H, and so attached to B by the pin F as to be capable of moving to a small extent relatively to B; but in all other directions its motions are controlled by those of B. This slide E is actuated in one direction by the pin or projection D, and in the other by a spiral spring, *e*, and the amount of its motion is graduated by the cam M, attached to its end by the pivot *m*. To this slide E, I attach another roughened feeding-bar, J, which projects through a slot in the plate I on the opposite side of the needle from the feeder G, and takes hold of the cloth after it has passed the needle and has been sewed. As the eccentric C revolves in the direction of the arrow from the position shown in the drawings, both feeders are lowered from contact with the cloth, and they follow the eccentric by the force of the springs *b* and *e* until the cam M strikes the pin H; when E remains stationary and B moves on until it strikes the cam L. If, then, the eccentric has not finished its stroke, it moves on independent of B, except to raise both G and J into contact with the cloth until it strikes the side *o*, when B is forced along, carrying with it the cloth. When the pin D strikes E, the latter is carried with B until the end of the stroke, and the parts are again in the position shown.

The operation of my invention is simply this:

When a piece of cloth is to be gathered and sewed to another piece of cloth, the cam M is so turned as to give to the slide E a shorter throw than the slide B has. The result of this is, the gatherer G, which takes hold of the under piece of cloth before it reaches the needle, is moved forward for a greater or less distance, while the same cloth is held still by the feeder J forward of the needle, and thus a fold is made in this cloth directly where the needle pierces it; then the projection D brings up against E and the feeder J is moved forward through a less space than that traversed by G. Thus the fold is connected past the needle and the stitch fastens it. The feeder J, taking hold of the under cloth only when it is already sewed to the upper, of course moves both and regulates the length of the stitch, while the relative throw of the gatherer G determines the amount of gather put into the lower piece of cloth.

By increasing the travel of B while the travel of E remains the same, I can increase the fullness of the gathers at pleasure; and by diminishing the travel of E while the travel of B remains the same I can produce a similar effect. In the first case the stitches remain of the same length as before, while in the latter case the stitches are shortened in proportion as the gathers become more full. Either of these modes of operating may be adopted, or both may be combined by dividing the change between the two cams, turning one a little in one direction and the other a little in the other direction; a perfect control of the operation being maintained by these cams, so that the fullness of the gathers may be varied indefinitely while the work is progressing. It is often desirable to vary the gathers in a seam for the sake of producing a better effect in the goods, and it is very frequently necessary to do so toward the end of a seam, in order to make the two pieces of cloth come out together.

When it is desired to use the machine, not for gathering, but for sewing an ordinary seam, all that is necessary is to so adjust the cams L M as to give to the gatherer and feeder the same throw, when an ordinary seam will be made, with any length of stitch required.

I have discovered that for an effective gathering apparatus in a sewing-machine two con-

ditions are necessary, viz: First, that part of the apparatus, however it may be constructed, which forms the folds or gathers, must take hold of the cloth before it has reached the needle and release its hold on the same immediately after it has passed it; otherwise it will tend to carry both pieces of cloth equally, and thus form no gathers, and the "feeder," properly so called, must take hold of the cloth after the seam is made, so as to carry it evenly forward to regulate the length of the stitch; second, the movement of both these parts should be capable of independent and easy adjustment, so as to control with facility both the fullness of the gathers and the length of the stitches at the will of the operator.

Although I prefer the reciprocating movement in this apparatus for its greater simplicity and compactness, still the rotary may be used by making it conform, by suitable mechanical devices, to the conditions above enumerated.

I do not claim as my invention a feeder having a back-and-forward and up-and-down movement, for I am aware this is already in use; neither do I claim two distinct feed-wheels having a differential motion, for this is already patented; but

What I do claim as my invention for the improvement of sewing-machines is—

1. A gathering and feeding mechanism in two distinct parts, so constructed and operated that the gatherer takes hold of and moves the cloth up to the needle, leaving it immediately after the stitch is formed or at the point where it is formed, and the "feeder," properly so called, takes hold of and feeds the cloth after the seam is made.
2. The combination of the part E J with the part B G, or their equivalents, operating together substantially as described, and for the purposes specified.
3. Regulating the fullness of the gathers by varying the relative throw of the feeding devices, substantially in the manner herein described.

GEO. B. ARNOLD.

Witnesses:

JOHN OAKLEY,
A. ARNOLD.