FOSKET & SAVAGE.

Sewing Machine.

No. 22,719. Patented Jan'y 25, 1859.

Fig. 1,

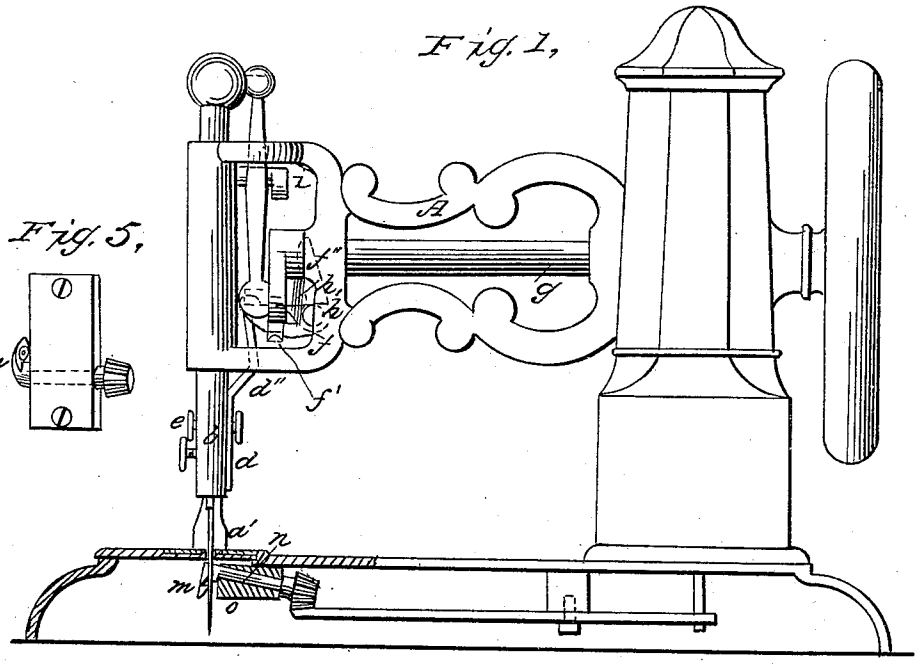


Fig. 5,

Fig. 2,

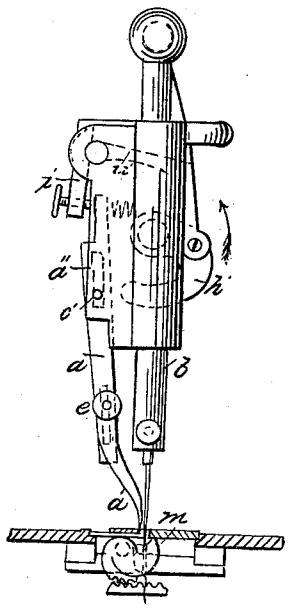


Fig. 3,

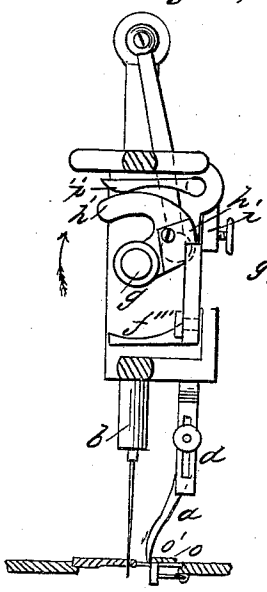
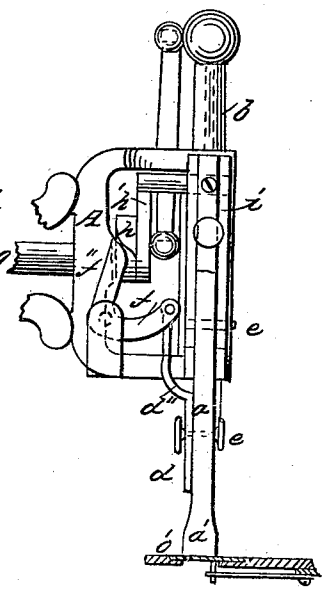


Fig. 4.



UNITED STATES PATENT OFFICE.

WILLIAM A. FOSKET AND ELLIOT SAVAGE, OF MERIDEN, CONNECTICUT.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **22,719**, dated January 25, 1859.

To all whom it may concern:

Be it known that we, WILLIAM A. FOSKET and ELLIOT SAVAGE, of Meriden, county of New Haven, and State of Connecticut, have invented certain new and useful Improvements in Sewing-Machines; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being made to the annexed drawings, making a part of this specification, in which similar letters indicate similar parts throughout the figures.

The nature of our invention consists in certain improvements, first, in the feeding mechanism, and, secondly, in the looping apparatus. The improvement in the feed consists in a means of causing the cloth to progress by a mechanism so operating as to grasp the same between two surfaces and give the feed without the aid of spring-pressure. The improvement in the looper is an improvement on the patent issued to E. Savage, April 6, 1858; and it consists in setting the rocking shank, on which the looping-hook is secured, at an angle to the bed-plate, so that the endwise motion, according to said patent, (wherein the said shank is parallel to the said bed-plate,) will be avoided. The means by which the feeding-foot is made to operate with a positive force without spring-pressure consists of a slide-bar so connected with the foot that while imparting a positive motion at each feed action to bring said foot upon the cloth, it yet provides for self-adjustment to meet the requirements of different thicknesses of material, as well as for going over seams. Another feature operating in connection with the feeding-foot is a means for obviating the tendency of one surface of the cloth to slip upon the other piece. This we accomplish by making a section of the table directly under the place where the foot acts capable of sliding back and forth in the line of the feed. Both surfaces thus move along together, thereby causing both pieces of cloth to travel alike.

The feeding-foot is shown at *a*, and is a bar curved as shown, and having a wedge-shaped end, where it acts upon the cloth. It is placed at the extremity or head of the bracket or arm A, overhanging the table, so as to stand nearly vertical and at one side of the needle-bar *b*. The curve brings the wedge *a* underneath the head of the bracket and in close proximity to where the needle plays, as seen in Figs. II and III. The feed-foot has two motions. One motion is vibratory in the line of the feed, while the other motion is reciprocatory and perpendicular to the table. In the shank *a* there is a slot cut, as seen in the dotted line *a''* of Fig. II, through which there is a fixed pin, *c*. This is in the end plate of the bracket A, and by it the shank becomes secured to the bracket. The shank plays along the pin by its slot, and is thus able to perform the up-and-down motions, as well as the vibratory one in the line of feed. The distance upward the motion of *a* is allowed to extend is regulated by the position of the pin *c*, since that pin acts as a stop on being struck by the bottom of the slot. Movement is given to the feeding-foot by two pieces of mechanism, which act independently of each other. Thus the up-and-down motion is produced by one piece and the feed motion by the other of said pieces. The most important is that which raises and lowers the presser-foot, because, as this is done by positive force, the principle of self-adaptation to act on varying thickness of materials without the aid of spring-pressure is involved in it. The distance of travel of the piece which raises and lowers the feed-foot is always the same. The foot is raised by means of a slipping bar, (seen at *d*,) being a flat plate, part of which is straight—viz., that portion which presses against the side of *a*, and having a crook to set off the upper portion, as at *d''*. In the flat part *d* there is a slot, cut as shown in Figs. II and III. Through this slot, and also through the side of *a* there is a small screw-bolt, *e*, having a milled head on one end and a like milled nut on the other. By this screw, therefore, the bar *d* is held up against *a*. The pressure of *d* upon *a* is regulated to such a degree as is necessary to give the required friction for raising the feed-foot and for bringing it down with sufficient force to grip the materials being sewed. It will now be seen that the adjustment for degrees of thickness lies in the operation of the two slots—viz., that in *d* and that in *a*—for as *d* always travels the same distance in its motions, if *a* is arrested, either in going up or down, before *d* has reached the end of its stroke, *d* must slip along the surface of *a*, the slot permitting of such movement. The operating of *d* is by means of crank and cam-work of ordinary character. *f* is a bell-crank, shaped as shown. To one end the

slipping piece *d* is fixed, and this end also receives the action of the cam which gives the down motion. The upward motion is produced by a cam striking the other end, *f‴*, of the bell-crank. In forcing down *d* the cam does not strike directly upon the arm *f*, but acts upon a curved piece projecting out from said arm, and as seen at *f‴* of Figs. I and III. The cams are placed upon the end of the revolving shaft *g*. That which operates the end *f‴* is a beveled edge piece fixed to the inner side of the crank-arm, as shown at *h*, Figs. I, III, and IV. In Fig. IV it is shown in the act of striking said arm. The other cam is a curved piece prolonged from the end of the crank which drives the needle-bar, as shown at *h′*. This cam acts not only on the arm *f*, but also produces the motion for giving the feed. In forcing down *d* this cam strikes the curved piece first at or near the place where that joins the toe *f*, giving the down-thrust and maintaining the pressure upon the feeding-foot for a considerable portion of a revolution—*i. e.*, until the needle has been completely withdrawn above the table. This it does by means of the great amount of surface over which the cam acts, and which extends the whole length of *f‴*. By keeping the foot down during this portion of the revolution of the shaft it acts as a cloth-stripper for the needle. When the cam *h′* has got clear of the toe *f‴*, the feed takes place, and although at that time there is no pressure maintained upon the feeding-foot, yet it will not slip by without carrying the cloth with it. This arises from the position the wedge has with respect to the axis point or pin upon which it vibrates. It will be seen that *a′* is not placed directly beneath that pin C, but stands at one side of it, as seen in Figs. II and III. In moving from the position as in first-named figure to this of the last the course of the wedge, if unobstructed, would be to describe an arc, the curve sinking beneath the surface of the table; but as the foot follows the plane of the table the shank *a* is compelled to rise, and it slips therefore along the piece *d*, the upward motion being all the while resisted by the friction of the two surfaces in contact, so that, although the direct action of the cam *h′* is taken off, the gripping action still continues until the end of the feed. The feeding motion—*i. e.*, that motion which gives the onward direction to the cloth—is produced by the same cam, *h′*, striking the tail of the cranked lever shown at the head of the bracket A. One end of this lever, at *i* in the several figures, acts upon that end of the bar *a* which is situated above the axis-pin *c*. The other end, at *i′*, is acted upon by the cam *h′*. The point of the screw in *i* strikes *a*, and the length of stitch is regulated by the distance this is screwed in or out, in a manner well known and common to sewing machinery. The part which causes both surfaces of cloth to move together is the sliding plate or section of the table, as heretofore mentioned. This plate is seen at *o*, and is a sliding piece laid in a recess of the table, so as to lie flush with its surface, and to be guided at those sides which lie parallel to the line of feed. There is a cross-cut, *o′*, in said plate, which is intended to receive the wedge part of the feed-piece, and it is by this that the plate is carried along by said feed-piece when moving in that part of its motion which gives the feed to the cloth. The return of the plate back after the foot is raised is effected by a spring acting beneath. When feeding cloth, the action of the feed-foot is to force the materials down into the cross-cut, and then a firm grip is given to both pieces, and therefore by the plates moving at the same time as the feed-foot and along with it all the cloth is carried in a body also. The moment that the foot rises for a new hold the plate, being no longer held, flies back, slipping past the cloth at that time.

The second feature will be understood by reference to the patent of E. Savage, above named. In that it will be seen that the looper consists of a hook fixed to the end of a spindle or shank placed beneath the table, the said shank lying parallel to the under side of the table. In this position it has a partial rotary motion to bring the looping-hook into the loop, and then a motion in the direction of its length, in order that the end of the looper may bring the loop then spread upon it into the path of the needle at its next descent. The necessity for this reciprocating motion of the shank is obviated by our method of placing it. In Figs. I, II, and V the hook is shown at *m* affixed upon a shank, *n*, and, as will be seen in Fig. I, the shank is set in its journal or box *o* at a considerable angle to the under side of the bed-plate, the end upon which the hook is affixed being nearest to said plate. The plane in which the looping-hook moves will by this construction be inclined as to the plane in which the needle moves. The looping-hook should be set so that its plane of motion will intersect that of the needle, and thus when the end of the looper is brought up against the bed-plate it will have been carried sufficiently around the needle to spread the loop in the path of the needle, as shown in Fig. V, while the end will also, when at its extreme outward throw, be in proper position in front of the needle to pass into and take the loop, as clearly seen in Fig. I.

The other parts of the machine being as usual, it is needless to describe them, and the operation will be as follows: The needle being threaded and raised above the table, raise the feed-foot also and slip the cloth under it, revolve the shaft *g*, and the sewing will then go on. The needle, descending, passes through the cloth and has its loop taken on the looper. The feed-foot will then come down and press upon the cloth at the spot which is directly over the cut *o′* in the plate *o*. The cam *h* is at that time acting upon *f‴*, and the foot will press the cloth into said cut. The travel of *d′* is such as to bring the foot down hard upon the plate when there are no materials to be sewed upon it.

Consequently the wedge will be stopped sooner or later in the downward movement, according to the degree of thickness in the cloth, and therefore according to such thickness will be the extent of the slipping movement of the piece *d*. The needle now rising, the cam *h'* strikes *i* and gives the feed. While the cam *h'* is still on *i* the other cam, *h*, has arrived so as to strike the arm *f''* of the bell-crank, and the slipping piece *d* is accordingly raised. As soon as the foot has been lifted to a proper height the bottom of the slot *a''* will have arrived at the pin *c*, and the further motion of said foot will be arrested, though the slipping piece will still go on to the end of its stitch. In this way the raising and bringing down of the feed-foot will always be caused to accommodate itself to all thicknesses of material it may be sewing, as well as of different degrees of thickness in the same material. If the goods are thin, less pressure of the foot will answer to feed. Consequently the nut *e* may be slackened and the friction of *d* against *a* lessened, and also it may be tightened for harsh and heavy goods, according to the necessities of the case.

The operation of the looping part will be clearly understood from the description thereof, as above.

We claim—

1. The feeding device, constructed and arranged substantially as herein set forth, and so operating as to cause the cloth to progress by grasping the same with a positive force, in contradistinction to the employment of spring-pressure between two surfaces moving in unison while feeding.

2. Setting the shank of the revolving and reciprocating looping-hook at an angle to the bed-plate, substantially as specified, when said looping-hook is constructed in the manner herein described or referred to, for the purpose of avoiding motion of the said hook in the direction of the axis of revolution.

3. Operating the slide-plate *o* from above the sewing-table by means of a feed-foot having two motions, one vibratory in the line of feed, the other reciprocatory and perpendicular to the table, or thereabout.

In testimony whereof we have hereunto subscribed our names.

WM. A. FOSKET.
ELLIOT SAVAGE.

Witnesses:
ALMONN MILES,
JOHN W. MILES.