

(No Model.)

2 Sheets—Sheet 1.

F. EGGE.

ATTACHMENT FOR STITCHING AND CUTTING BUTTON HOLES.

No. 345,419.

Patented July 13, 1886.

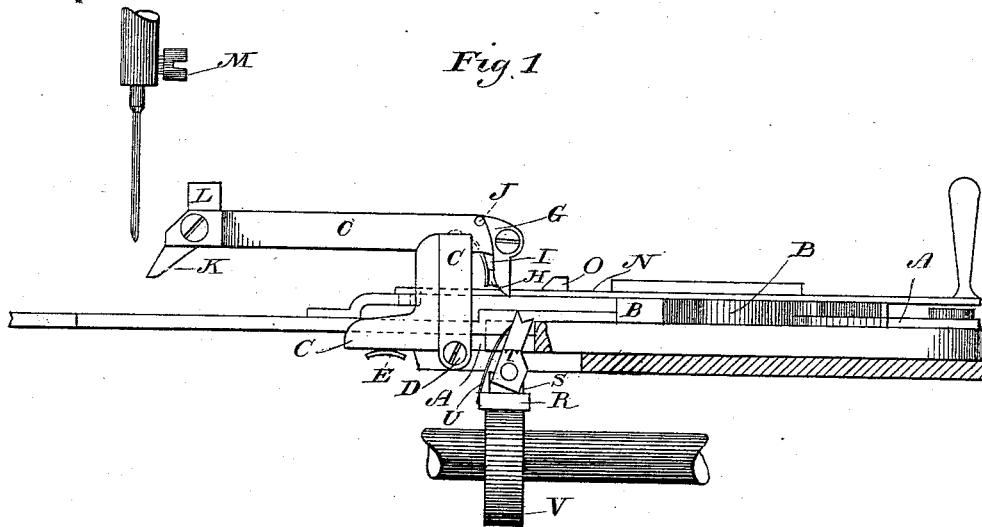


Fig. 1

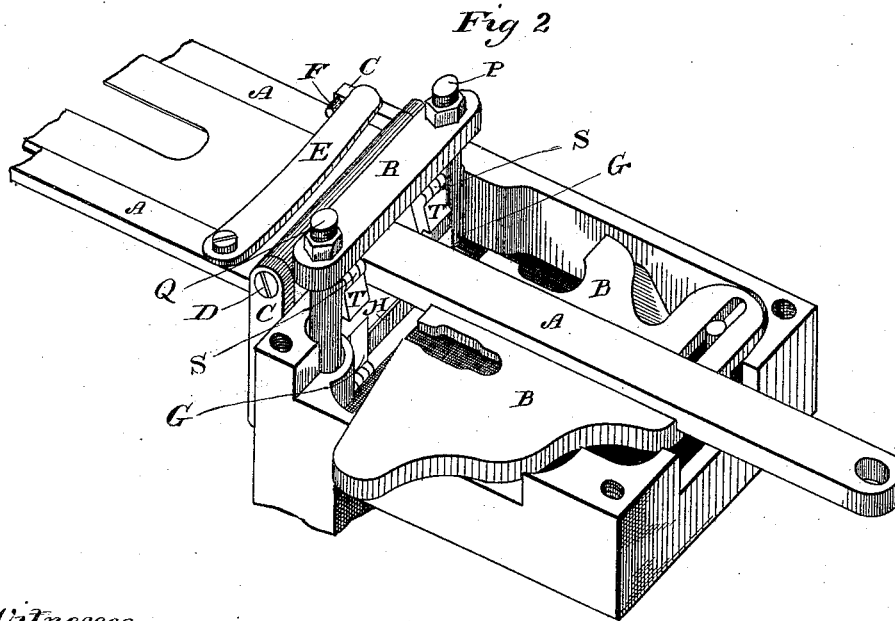


Fig. 2

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# UNITED STATES PATENT OFFICE.

FREDERICK EGGE, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE SMITH  
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## ATTACHMENT FOR STITCHING AND CUTTING BUTTON-HOLES.

SPECIFICATION forming part of Letters Patent No. 345,419, dated July 13, 1886.

Application filed January 23, 1886. Serial No. 189,488. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK EGGE, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Attachments for Stitching and Cutting Button-Holes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain novel and useful improvements in machines for sewing button-holes, and has for its object to provide means for cutting the button-hole simultaneously with the stitching of either side without any interference whatever with the barring; and with these ends in view my invention consists in the details of construction and combination of elements hereinafter fully explained, and then specifically designated by the claims.

In order that those skilled in the art to which my invention appertains may more fully understand the same, I will proceed to describe it in detail, referring by letters to the accompanying drawings, forming a part of this specification, in which I have shown my improvement applied to the button-hole sewing-machine illustrated and described in Letters Patent of the United States No. 206,768, granted August 6, 1878, to S. J. Baird.

In the drawings, Figure 1 is a side elevation, partly in section, showing the relative position of the actuating-pawls, the feed-bar, and shifting-plate when the machine is about to commence the operation of stitching a button-hole; Fig. 2, a bottom perspective with the bed-plate removed; Fig. 3, a detail side elevation showing the relative position of the shifting-plate, feed-bar, actuating-pawls, and cutter-frame just after the machine has finished barring and preparatory to the operation of the cutter; and Fig. 4, a view similar to Fig. 3, but showing the position of the actuating-pawls and cutter while in operation.

Similar letters denote like parts in the several figures of the drawings.

It is not deemed necessary to show by the drawings and herein specifically describe all

the parts of the machine which forms the subject-matter of the invention set forth in the aforesaid patent, such as the means employed to effect the oscillation and feeding, or to hold the fabric within which the button-hole is stitched, or the devices instrumental in operating the shifting-plate, said parts and mechanisms being fully set forth in said patent, and forming no part of my present improvement.

A is the oscillator, and B the shifting-plate, constructed and arranged as in the aforesaid patent.

C is the cutter-frame, pivoted to the oscillator, as seen at D, so as to be capable of a vertically-reciprocating movement.

E is a flat spring, secured at one end to the bottom of the oscillator, the other end being adapted to bear against the frame C, so as to keep the cutter raised in its normal position.

F is a stop (see Fig. 2) projecting from the frame beneath and across the oscillator, the function of which is to arrest the upward movement of the cutter so that the normal position of the latter is always in the same horizontal plane. The upper part of the frame extends rearward slightly beyond the pivotal point D, and has pivoted thereto the pawls G, connected by cross-piece H, so as to have a simultaneous movement, as will be hereinafter explained.

I is a bow-spring attached to the frame and bearing against the cross-piece H.

J are stops (one only being shown) projecting from the frame against which said pawls abut, so that the latter in their normal position are in a vertical plane, as shown in Fig. 1.

K is the cutter-knife, and L the head thereof, which latter in its normal position is outside the field of operation of the needle-bar screw M, as seen at Fig. 1.

The feed-bar N is provided with a trip, O, which, during the forward movement of said bar, strikes the cross-piece H and throws the pawls G forward against the resiliency of the spring I, and keeps them out of their normal or vertical position during the barring of the forward end of the button-hole and until the cutter has passed within the barring-stitches, for the purpose presently explained.

P Q are the round reciprocating driving rods or shafts, and R is the adjustable cross-bar or

connecting-piece, set forth and described in the aforesaid patent. Instead of connecting these rods at the top by said cross-bar, I connect them at their lower ends, in order that they may be operated by a cam, V, on the shaft of the sewing-machine instead of by the needle-bar. The rods are thus vertically reciprocated by the action of this cam, for the purpose and with the result set forth in the said patent.

S are ears projecting from said cross-piece, and to these ears are pivoted pawls T, having their upper edges V-shaped, as shown in the several figures of the drawings.

U are flat springs, secured to the forward edge of the cross piece and bearing against the forward faces of said pawls, so as to keep them in their normal position inclined backward out of a vertical plane, as shown in Fig. 1.

The relative positions of the pawls G T are such that when they are both at a perpendicular their inner edges will be in the same longitudinal and cross-vertical plane, so that it will be readily understood that the vertical reciprocation of the cross-bar R will force the pawls T against the pawls G, and thereby cause the forward end of the cutter-frame to be depressed against the resiliency of the spring E. This action is so timed with the movement of the needle-bar that the needle-screw of the latter will in its downward course strike the head L and force the cutter downward within the fabric. It will then be seen that the head L is brought within the field of operation of the needle-bar screw by the upward movement of the cross-bar R when the pawls G T are in vertical alignment.

I will now proceed to describe the function and operation of those parts of the button-hole-sewing machine that I have shown, which parts by their operation directly affect the relative positions of the pawls, and consequently the operation of the cutter.

When the feed-bar N commences to move forward to feed the fabric outward, thereby enabling one side of the button-hole to be stitched, there is no movement of the cutter, for the reason that the pawls T are inclined rearward out of the vertical plane of the pawls G, as shown at Fig. 1, and consequently there will be no engagement of said pawls. When said side has been stitched and the barring is begun, the trip O on the feed-bar will have been forced against the cross-piece H, so as to throw the pawls G forward, while at the same time the shifting-plate B will have been forced against the pawls T, so as to bring them in a perpendicular position, all as shown at Fig. 3, so that it will be readily understood that during the barring, the pawls being out of vertical alignment, the cutter will not operate. When the feed-bar commences to move backward, the pawls G will gradually follow the retraction of the trip until they are in vertical alignment with the pawls T, as shown in dotted lines in Fig. 3. During this initial retraction of the trip the

cutter will of course not operate until the pawls G T are brought into vertical alignment, and in the meantime the fabric will have been fed backward a distance sufficient to cause the cutter to operate within the barring-stitches, so as not to cut the latter. In other words, the cutter is behind the needle, as shown in Fig. 3, and it is obvious that if the cutter were allowed to operate immediately after the needle has completed the barring-stitches, the latter, as the fabric is fed backward, would be cut through. Therefore the throw of the pawls G is such that they will not have been brought into operative position by the retraction of the trip until the fabric shall have been fed backward a distance sufficient to bring the field of operation of the cutter within the barring-stitches. When the pawls are in vertical alignment, the upward movement of the cross-bar R will cause the lower pawls, T, to strike against the upper pawls, G, and thereby depress the cutter, as shown in Fig. 4. This movement of the cross bar is so timed as to bring the head of the cutter forward within reach of the needle-bar screw M in its downward course, so that the latter will assist in the depression of the cutter, and thereby partially relieve the strain on the pawls. On the downward movement of the cross-bar the needle-bar will be elevated and the cutter-frame returned to its normal position by the action of the spring E. This operation of the cutter will continue until the barring again commences, when the shifting-plate B will again be operated and thrown backward, thereby releasing the pawls T, which latter will immediately be thrown backward by the springs U out of vertical alignment with the pawls G. The cutter will accordingly now cease to operate, and moreover will not again operate until the pawls G T shall have been again brought into vertical alignment by the action of the feed-bar N and the shifting-plate B, as hereinbefore fully set forth.

It is of course obvious that the movement of the cutter may be so timed as to cut the button-hole during the stitching of either side thereof, and therefore, since the position of the cutter with relation to the needle is such that their respective fields of operation are in about the same vertical cross-plane, it follows that the button-hole is cut simultaneously with the stitching of either side, and this, so far as the state of the art in sewing-machine attachments of this description is concerned, is the only practical way known of making a machine sewed and cut button-hole.

It is not absolutely necessary that the needle-bar screw should assist in depressing the cutter, since the throw of the lower pawls is high enough to effect the result aimed at. My improvement is adapted for use on any button-hole-sewing attachment, it being necessary only to pivot the cutter-frame to the oscillating mechanism in order that the cutter may always be in the same vertical longitudinal plane with the space between the rows of side

stitches, it being a matter of mere mechanical skill to cause the depression of the cutter within the fabric simultaneously with the stitching of either side of the button-hole, the gist of my invention resting in the broad idea of a cutter pivoted to the oscillating mechanism and adapted to be vertically reciprocated to cut the button-hole only during the stitching of either side thereof and within the barring-stitches.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an attachment for cutting and stitching button-holes, a cutter mounted in the end of a frame pivoted to the oscillating mechanism, in combination with means—as the needle-bar or the driving-shaft—for effecting a vertical reciprocation of said frame, whereby the cutter is caused to penetrate the goods, substantially as set forth.

2. The combination, with the cutter mounted in the end of a frame pivoted to the oscillating mechanism, and means—as the needle-bar or driving-shaft—for effecting a vertical reciprocation of said frame, whereby the cutter is caused to penetrate the goods, of means dependent upon the movement of the feed-bar for automatically controlling said reciprocation of the frame, whereby the cutter is caused to penetrate the goods at a predetermined time, substantially as shown and specified.

3. The cutter-frame having secured therein the cutter and pivoted to the oscillator, in combination with spring-pawls pivoted to the rear end of said frame beyond the pivotal point and connected by a cross-piece, feed-bar having on its face a trip adapted to abut against said cross-piece and throw the pawls against their spring action, cross-bar attached to the vertically-reciprocating driving-rods, and having pivoted thereto spring-pawls,

shifting-plate adapted to force the latter pawls to a vertical position, and means—as a cam on the driving-shaft—for causing the vertical reciprocation of the said cross-bar, substantially as shown and described.

4. The combination of the oscillator, the cutter-frame pivoted thereto and having secured therein the cutter, pawls G, pivoted to the rear end of said frame, cross-piece H, connecting said pawls, spring I, secured to said frame and bearing against said cross-piece, stops J, feed-bar having on its face the trip O, adapted to strike against said cross-piece and throw said pawls forward, vertically-reciprocating rods P Q, cross-bar R, attached to said rods, pawls T, pivoted to said cross-bar and having their upper edges V-shaped, springs U, secured to the cross-bar and bearing against the latter pawls, shifting-plate B, adapted to strike against the pawls T and force them to a vertical position, operating-cam V, adapted to effect the vertical reciprocation of the cross-bar, spring E, secured at one end to the oscillator and with its free end bearing against the bottom of the cutter-frame, whereby the latter is elevated in its normal position, and stop F, all substantially as shown, and for the purposes hereinbefore set forth.

5. The method herein-described of making button-holes, the same consisting in stitching one side of the button-hole and barring one end, then stitching the other side and simultaneously cutting the button-hole step by step in the immediate rear of the needle, and finally barring the other end, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK EGGE.

Witnesses:

S. H. HUBBARD,  
S. S. WILLIAMSON.