(Model.) 2 Sheets—Sheet 1.

L. T. BULLEY.

OVERSEAMING ATTACHMENT FOR SEWING MACHINES.

No. 456,354. Patented July 21, 1891.

Fig. 1

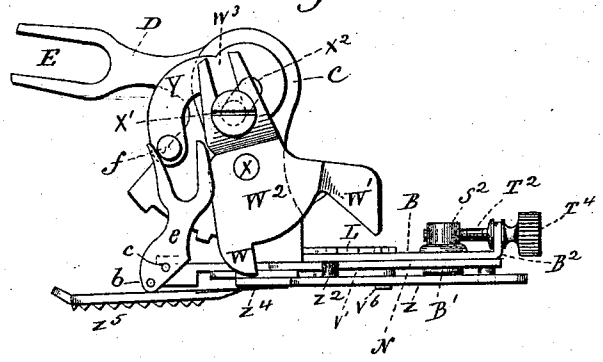


Fig. 2

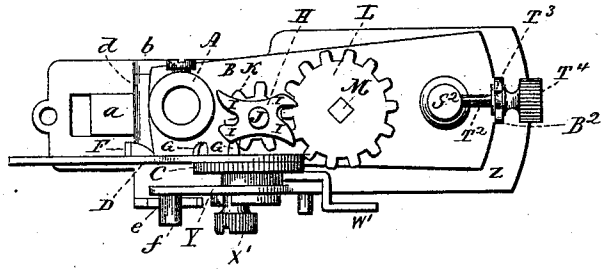


Fig. 3

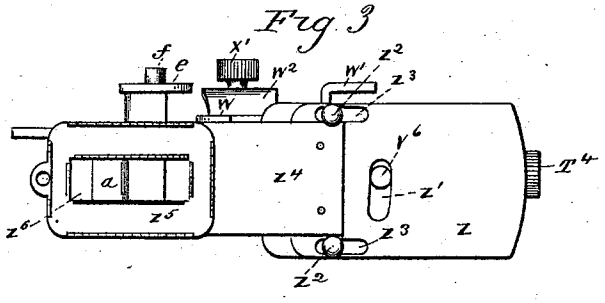


Fig. 7

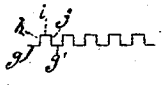


Fig. 4

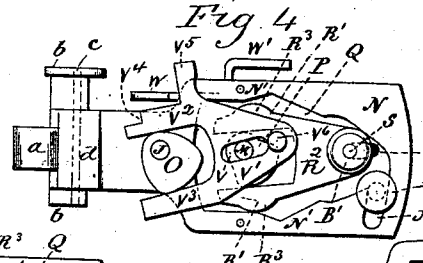


Fig. 5

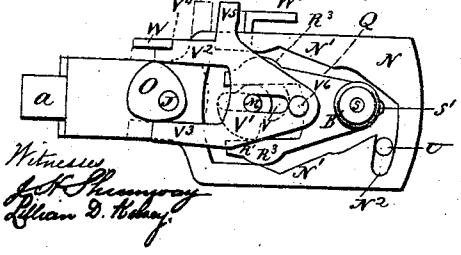
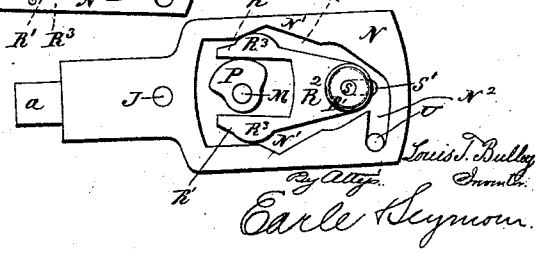


Fig. 6



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(Model.) 2 Sheets—Sheet 2.

L. T. BULLEY.

OVERSEAMING ATTACHMENT FOR SEWING MACHINES.

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Fig. 8

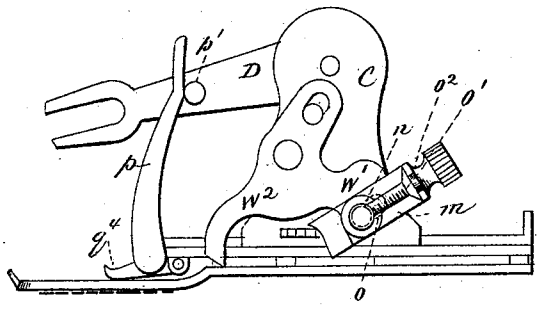


Fig. 9

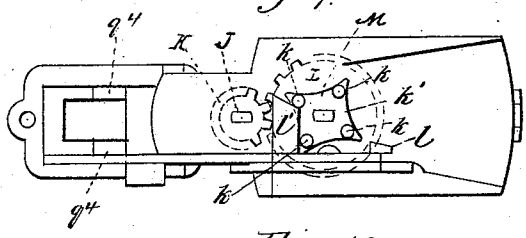


Fig. 10

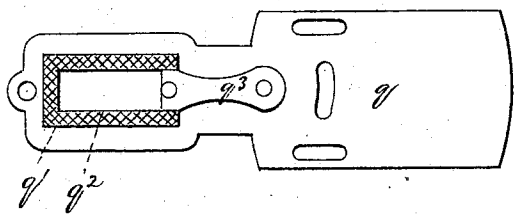


Fig. 11

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UNITED STATES PATENT OFFICE.

LOUIS T. BULLEY, OF TYLER CITY, CONNECTICUT, ASSIGNOR TO THE PEERLESS BUTTON HOLE ATTACHMENT COMPANY, OF SAME PLACE.

OVERSEAMING ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 456,354, dated July 21, 1891.

Application filed June 9, 1890. Serial No. 354,679. (Model.)

To all whom it may concern:

Be it known that I, LOUIS T. BULLEY, of Tyler City, in the county of New Haven and State of Connecticut, have invented new Improvements in Overseaming Attachments for Sewing-Machines; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in side elevation of one form which my improved device may assume; Fig. 2, a top plan view thereof; Fig. 3, a reverse plan view thereof; Fig. 4, a reverse plan view thereof with the feeding-foot and feed-plate removed and the feeding-dog retired to permit the production of a transverse stitch; Fig. 5, a similar view showing the feeding-dog in position for feeding the cloth forward in the production of a longitudinal stitch; Fig. 6, a similar view with the dog removed; Fig. 7, a diagram showing the elemental overseaming stitch which the device is designed primarily to produce and which may be much modified for embroidery-stitching by changing the tension of the thread. Fig. 8 is a view in side elevation of the preferred form of my device. Fig. 9 is a plan view thereof; Fig. 10, a detached reverse plan view of the feed-plate and feeding-foot employed in my preferred construction. Fig. 11 is a diagram showing one of the embroidery-stitches which may be produced by changing the tension of the thread.

My invention relates to an improved overseaming attachment for sewing-machines, the object being to make a simple device of few parts adapted to produce a novel and effective stitch, which may be widely modified for use as an embroidery-stitch by changing the tension of the thread.

With these ends in view my invention consists in an overseaming attachment having certain details of construction and combinations of parts, as will be hereinafter described and pointed out in the claims.

As herein shown, the device is provided with the usual upright socket A, by means of which it is attached to the presser-bar of the sewing-machine to which it is applied, and by which it is actuated. This socket is rigidly secured at its lower end to the forward end of a base-plate B, which is provided at the right-hand edge of its forward end with an upright arm C, extending above the said socket. A bell-crank lever D, pivoted to the upper end of the said arm C and upon the inner face thereof, has one of its arms provided at its outer end with the usual fork E for engagement with the needle-bar of the machine, and its other arm provided at the forward edge of its lower end with a beveled inwardly-projecting finger F, which I shall hereinafter call, from the function it performs, a "restoring-finger," and at the rear edge of its lower end with two inwardly-projecting operating-teeth G G. The said finger and teeth just mentioned co-operate to rotate an oblong driving-cam H, having a pair of prongs I I at each of its ends and rigidly secured to a short upright driving-shaft J, journaled in the bed-plate B, near the forward end thereof, and also carrying a small driving-pinion K, having bearing upon the upper face of the base-plate and located directly under the said driving-cam. The said pinion meshes into a driven pinion L, having twice as many teeth bearing upon the upper face of the bed-plate and secured to a short upright driven shaft M, journaled therein. Under the described construction the driving-cam and driving-pinion make a half-turn and the driven pinion a quarter-turn for every complete stroke of the bell-crank lever, which, when raised, engages its teeth G G with the adjacent prongs of the driving-cam and turns the same half around, and when depressed engages its beveled restoring-finger with the adjacent edge of the cam, and swings the same into right position for the engagement of its prongs by the said teeth when the lever is again raised. The lower end of the driving-shaft J projects below the base-plate and through the vibrating plate N, for which it forms a fulcrum, and receives at its extreme lower end the cam O, which supports the forward end of the said vibrating plate in position and holds the same against the lower face of the base-plate. The lower

end of the driven shaft M also projects below the base-plate and carries a switch-cam P, which is located in the forward end of a large opening Q, formed in the vibrating plate. The said switch-cam is engaged by the two forwardly-projecting arms R′ and R′ of a switch R^2, located in the opening Q of the vibrating plate before mentioned, and longitudinally movable therein, and fulcrumed at its extreme rear end upon a stud S, to which it is secured by a flat key-nut B′, the said stud extending downwardly through an elongated slot S′, formed in the rear end of the base-plate B and made integral with a flanged head S^2, having bearing upon the upper face of the said base-plate and movable thereon and having formed in it a transverse threaded opening receiving the forward end of a horizontal adjusting-screw T^2, having a grooved neck T^3 and mounted in a slotted arm B^2, turned up from the rear end of the base-plate and entering the said grooved neck. The extreme rear end of the said screw is provided with a knurled head T^4, whereby the screw is turned to shift the stud, and so move the switch in the opening of the vibrating plate, and thus vary the vibratory action of the same.

The outer edges of the arms R′ and R′ of the switch are provided with convexed cam-faces R^3 R^3, which co-operate with indentations N′ N′, formed in adjacent edges of the opening Q in the vibrating plate to vary, as the switch is longitudinally adjusted, the arc in which the vibrating plate plays. The said switch and the opening Q are shaped so that when the plate is thrown to either limit of its vibration the switch will engage at the outer end of one of its arms and at a point at its rear end on the opposite side of its fulcrum with the edges of the opening, and so lock the vibrating plate against movement, which is necessary to be done in order that the parts may not move when the longitudinal stitches are being formed. The switch-cam, it may also be mentioned, is shaped so that it shifts the switch only on alternate strokes of the bell-crank lever, holding the switch at either limit of its throw during two of its actuations. The said vibrating plate is supported at its rear end by means of a headed pin U, depending from the rear end of the base-plate and entering a transverse slot N^2, offsetting from the opening Q at the rear end thereof. The extreme lower end of the shaft M projects below the switch-cam carried by it and enters a longitudinal slot V, formed in the rear end of a feeding-dog V′, which it guides, the said dog being provided at its forward end with two parallel arms V^2 and V^3, which receive the feeding-dog cam O between them. The said arm V^2 is provided with a shoulder V^4 and an outwardly-projecting finger V^5, respectively, engaged alternately by fingers W and W′, formed at the lower end of a rocking arm W^2, hung upon the outer face of the upright arm C of the base-plate by a stud X, and having its upper end slotted, as at W^3, for the adjustment of a driving-stud X′, which passes through it and enters a similar slot X^2, formed in the inner end of an operating-arm Y, located on the outside of the arm C and having the same center as the bell-crank lever, with which it is rigidly connected. Under this construction the motion derived from the bell-crank lever is transmitted to the feeding-dog for operating the same in both directions of its longitudinal movement. The said cam O is shaped so that it will alternately retire the feeding-dog, as shown by Fig. 4 of the drawings, and switch it into position, as shown by Fig. 5 thereof, to be operated upon and actuated by the fingers of the rocking arm. The said longitudinal movement of the feeding-dog is transmitted by a downwardly-projecting stud V^6, located at its rear end to a feed-plate Z, which is transversely slotted, as at Z′, to receive it, the said feed-plate being secured to and below the vibrating plate with a capacity for longitudinal play relative thereto by means of two headed pins Z^2 Z^2, secured to the opposite edges of the vibrating plate and entering the elongated slots Z^3 Z^3, formed in the respective edges of the feed-plate, which closes in the switch and supports the feeding-dog V′. A broad flat spring Z^4, secured to the forward edge of the feed-plate, carries at its forward end a flat feeding-foot Z^5, having its lower face furnished with serrations to engage with the fabric or material being ornamented and having formed in it an elongated opening Z^6, through which a smoothly-curved narrow presser-foot *a* extends to rest upon the fabric or material, the said presser-foot *a* being formed at the extreme forward end of the vibrating plate. Normally the presser-foot rests upon the fabric or material, from which the feeding-foot is cleared by the action of the spring Z^4; but to feed the fabric or material, the feeding-foot is engaged with it by means of two cams *b b*, respectively secured to the opposite ends of a rock-shaft *c*, journaled in a bearing *d*, secured to the vibrating plate and located directly in the rear of the presser-foot *a*, the said shaft having secured to one of its ends an operating-lever *e*, forked at its upper end to receive a stud *f*, located at the outer end of the arm Y, before referred to. When the bell-crank lever is lifted, the cams *b b* are thrown down upon the upper face of the feeding-foot, which, by virtue of its spring connection Z^4, will yield and be depressed below the presser-foot and engaged with the cloth for feeding the same. When, on the other hand, the bell-crank lever is thrown down, the cams will be disengaged from the feeding-foot, which will then be restored by the spring Z^4 to its normal position, in which it clears the cloth.

Having now described in detail the construction of my improvement, I will proceed to set forth the mode of its operation. The

elemental stitch, which is shown by Fig. 7 of the drawings, consists, as will be observed, of a series of alternate transverse and longitudinal stitches, with the latter extending at a right angle from the opposite ends of the former. It will at once be clear from the foregoing that the longitudinal stitches, which are made when the fabric is fed forward, must be formed alternately from either limit of the transverse movement imparted to the fabric for producing the transverse stitches, and that the parts of the device must therefore be held in rigid position at the said limits when the longitudinal stitches are being formed. As shown by Figs. 1, 2, and 3 of the drawings, the parts are shown in the positions due to them after the cloth has been fed forward preparatory to forming a stitch corresponding to the longitudinal stitch *g*. (Shown in Fig. 7 of the drawings.) At this time the vibrating plate and the switch will be thrown to the right-hand limit of their vibration. Now when the bell-crank lever is thrown down by the needle-bar and the said stitch formed, the finger W′ of the rocking arm engages with the finger V^5 of the feeding-dog and moves the same, and hence the feed-plate and the feeding-foot, forward. Then as the bell-crank lever is lifted the dog-cam O operates to switch the dog to one side and clear it from the fingers of the rocking arm, while at the same time the switch-cam P operates to throw the switch R^3 and move the vibrating plate N to the left-hand limit of its vibration, whereby the cloth is also moved preparatory to forming a stitch *h*. Now when the bell-crank lever is again thrown down by the needle-bar and the said stitch formed, the dog-cam makes a half-turn and switches the dog back into position for the engagement of its shoulder V^4 by the finger W of the rocking arm, and the switch-cam makes a quarter-turn without, however, moving the switch and continuing to hold it and the vibrating plate in their last-mentioned positions. The lever being now raised, the finger W of the rocking arm moves the feeding-dog, and hence the feed-plate and feeding-foot, rearward, whereby the cloth is fed forward preparatory to forming the left-hand longitudinal stitch *i*, the switch-cam being given a quarter-turn, without, however, moving the switch. The next depression of the lever sees the formation of the said stitch and the restoration of the feeding-dog to its feeding position. The succeeding elevation of the lever effects the throwing of the switch and vibrating plate to the limit of their left-hand movement, and so moves the cloth preparatory to forming the transverse stitch *j*. The next depression of the lever forms the said stitch, and its succeeding elevation effects the feeding of the cloth again preparatory to forming the stitch *g′*, and so on. The stitching thus formed is, as is readily apparent, peculiarly adapted to overseaming; but it may be given a wide variation of appearance by changing the tension of the thread, whereby the stitches will be pulled out of line with the pleasing and ornamental effect well suited to embroidery-work.

In the preferred form of my device (shown for convenience by Figs. 8, 9, and 10 of the drawings) the upright shafts J and M are actuated by means of four pins *k*, mounted in the four corners of a square in a quadrangular plate *k′*, secured to the pinion L and engaged by an actuating-finger *l* and a restoring-finger *l′*, projecting inwardly from the lower arm of the bell-crank lever D, hung from the upright arm C, which in this case is placed about midway the length of the base-plate. Under this construction the pinions K and L will be operated at the same relative rate as before. In the preferred construction, also, the longitudinal reciprocation of the feeding-dog is regulated by means of an inclined longitudinally-movable slide *m*, secured to the under face of the finger W′ of the rocking arm W^2 by a stud *n*, extending through an elongated slot *o*, formed in the said finger and adjusted by a screw *o′*, passing through the outer end of the said stud and connected with the outer end of the finger, which is thereto bent and shaped to enter an annular groove o^2, formed in the outer end of the screw. Furthermore, in the preferred construction the operating-lever *p* is actuated directly from a stud *p′*, located in the upper arm of the bell-crank lever D.

Another peculiar feature of the preferred construction is the feed-plate *q*, which is provided at its forward end with an opening *q′*, in which a serrated feeding-foot q^2 is movable up and down, the said foot being attached to one end of a spring q^3, the other end of which is secured to the under face of the plate, those portions whereof which surround the opening *q′* serving to smooth and lay the fabric. The feeding-foot is depressed to grip the cloth against the opposition of its spring by means of two cams q^4, located at the lower end of the operating-lever *p* and actuated thereby. This form of feed-plate and feeding-foot I prefer to the form first shown and described.

It is apparent from the foregoing that in carrying out my invention I am not obliged to employ the exact devices and arrangements set forth and shown, and I would therefore have it understood that I do not limit myself to the particular construction and combination of parts herein shown and described, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

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

1. In an overseaming attachment for sewing-machines, the combination, with a base-plate, of a vibrating plate, an operating-lever adapted to be connected with a reciprocating part of the machine, intermediate connections between the lever and vibrating plate, where-

by the latter is actuated upon every alternate complete movement of the lever, a feed-plate connected with the vibrating plate but free to have longitudinal movement independent thereof, and means independent of the vibrating plate for moving the feed-plate longitudinally to feed the cloth forward when the vibrating plate is at the limits of its throw and at rest, substantially as described.

2. In an overseaming attachment for sewing-machines, the combination, with a base-plate, of a vibrating plate, a feed-plate connected therewith, a switch for the vibrating plate, a switch-cam for the switch, a feeding-dog connected with the feed-plate, a cam therefor, and means for driving the cams to feed the cloth while the vibrating plate is at the limits of its vibration alternately, substantially as described.

3. In an overseaming attachment for sewing-machines, the combination, with a base-plate, of a vibrating plate having an opening formed in its rear end, a switch having two forwardly-projecting arms located in the said opening, a switch-cam located between the said arms and operating to move the switch and vibrate the plate on every alternate impulse, a feed-plate connected to and vibrating with the vibrating plate and longitudinally movable relatively thereto, a feeding-dog coupled with the feed-plate, means for actuating the dog to move the feed-plate rearward at either limit of the throw of the vibrating plate alternately, and a cam operating to switch the dog out of position for actuation between every alternate actuation of the device, substantially as described.

4. In an overseaming attachment for sewing-machines, the combination, with a base-plate, of a bell-crank lever having one of its arms provided with an actuating and a restoring finger, a pinion, four pins arranged at the four corners of a square, connected with the said pinion and arranged to be operated by the said fingers, a short upright shaft journaled in the base-plate and carrying the said pinion and pins, a pinion having half the number of teeth of the pinion before mentioned and meshing into the same, a shaft journaled in the base-plate and carrying the smaller pinion, a vibrating plate, and a feed-plate connected with the base-plate, and cams secured to the lower ends of the said upright shafts for vibrating the vibrating plate and controlling the reciprocation of the feeding-plate, the pinion connected with the pins being given a quarter-turn for every actuation of the bell-crank lever, substantially as described.

5. In an overseaming attachment for sewing-machines, the combination, with a vibrating plate having a large opening formed in it, of an adjustable switch located in the said opening and provided at its forward end with two arms having cam-faces upon their outer edges arranged to engage with co-operating faces in the adjacent edges of the opening, a movable fulcrum for the switch, whereby it may be moved to change the relation of its cam-faces to the said co-operating edges of the opening, and a switch-cam located between the arms to actuate the switch, substantially as described.

6. In an overseaming attachment for sewing-machines, the combination, with a vibrating plate having a large opening formed in it, of an operating-lever adapted to be connected with a reciprocating part of the machine to which the device is applied, intermediate connections between the said operating-lever and vibrating plate, whereby the latter is actuated upon every alternate complete movement of the lever, a switch located within the opening of the vibrating plate and constructed with two parallel arms, a cam located between the arms of the switch for operating the same, and intermediate driving connections between the operating-lever and cam, the said arms of the switch being respectively provided with an outwardly-projecting cam-face and the adjacent edges of the large opening in the vibrating plate with indentations whereby the switch will engage with the edges of the opening on opposite sides of its fulcrum in both of its positions, and so lock the plate against movement at both ends of its stroke during the intermediate movement of the operating-lever, substantially as described.

7. In an overseaming attachment for sewing-machines, the combination, with a vibrating plate and means for actuating the same, of a feed-plate connected with the vibrating plate so as to vibrate therewith, but free to move longitudinally independently thereof, a feeding-dog connected with the feed-plate, a rocking arm having two fingers adapted to engage with the dog to move the same forward and back longitudinally, a cam for alternately retiring the dog from the fingers and bringing it into the range of the same, and means for actuating the said rocking arm and cam, substantially as described.

8. In an overseaming attachment for sewing-machines, the combination, with a base-plate and an operating-lever carried thereby and adapted to be connected with a reciprocating part of the machine, of a vibrating plate located directly below the base-plate, a feed-plate located below the vibrating plate, a spring feeding-foot located at the forward end of the feed-plate vibrating transversely and longitudinally therewith, having an opening formed in it and normally held above the cloth, a presser-foot extending into the opening in the spring feeding-foot, and connections between the said operating-lever and the vibrating plate, the feed-plate, the spring feeding-foot, and the presser-foot, whereby the said movable parts are actuated, the spring feeding-foot being intermittently depressed upon the cloth, from which it is intermittently cleared automatically by its spring action, substantially as described.

9. In an overseaming attachment for sewing-machines, the combination, with a base-plate and an operative lever carried thereby and adapted to be connected with a reciprocating part of the machine, of a vibrating plate located directly below the base-plate, a feed-plate located below the vibrating plate and connected therewith for actuation thereby, but adapted to have longitudinal movement independently thereof, a feeding-foot having spring connection with the forward end of the feed-plate, having an opening formed in it and normally held by its spring action above the cloth, a presser-foot connected with the forward end of the vibrating plate and extending through the opening in the spring feeding-foot, and connections between the operating-lever and the vibrating plate, the feed-plate, the spring feeding-foot, and the presser-foot, whereby said movable parts are actuated, the spring feeding-foot being intermittently depressed upon the cloth, from which it is intermittently cleared automatically by its spring action, substantially as set forth.

10. In an overseaming attachment for sewing-machines, the combination, with a base-plate and an operating-lever carried thereby and adapted to be connected with a reciprocating part of the machine, of a vibrating plate located below the base-plate, a feed-plate located below the vibrating plate and having an opening formed in its forward end, a feeding-foot located in the opening in the feed-plate having spring connection therewith and constructed with a central opening, a presser-foot extending into the opening in the spring feeding-foot, and connections between the said operating-lever and the vibrating plate, the feed-plate, the spring feeding-foot, and the presser-foot, whereby the said movable parts are actuated, the spring feeding-foot being intermittently depressed upon the cloth, from which it is cleared automatically by its spring action and the cloth being smoothed down by those portions of the feed-plate adjoining the opening in its forward end, substantially as described.

11. In an overseaming attachment for sewing-machines, the combination, with a bell-crank lever, of a vibrating plate provided at its forward end with a presser-foot, a feed-plate secured to and vibrating with the vibrating plate, but free to have longitudinal movement independent thereof, a serrated feeding-foot located at the forward end of the feed-plate and having spring connection therewith and normally held out of contact with the cloth upon which the presser-foot rests, two cams arranged in position to engage with the feeding-foot to force the same onto the cloth, a horizontal rock-shaft journaled in the forward end of the vibrating plate and carrying the cams, and connection between the said rock-shaft and the bell-crank lever, whereby the shaft is operated by the same, substantially as described.

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Witnesses:
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