

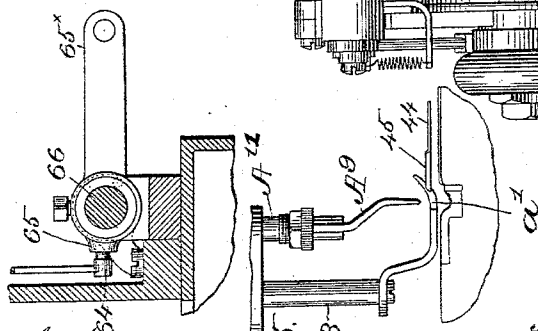
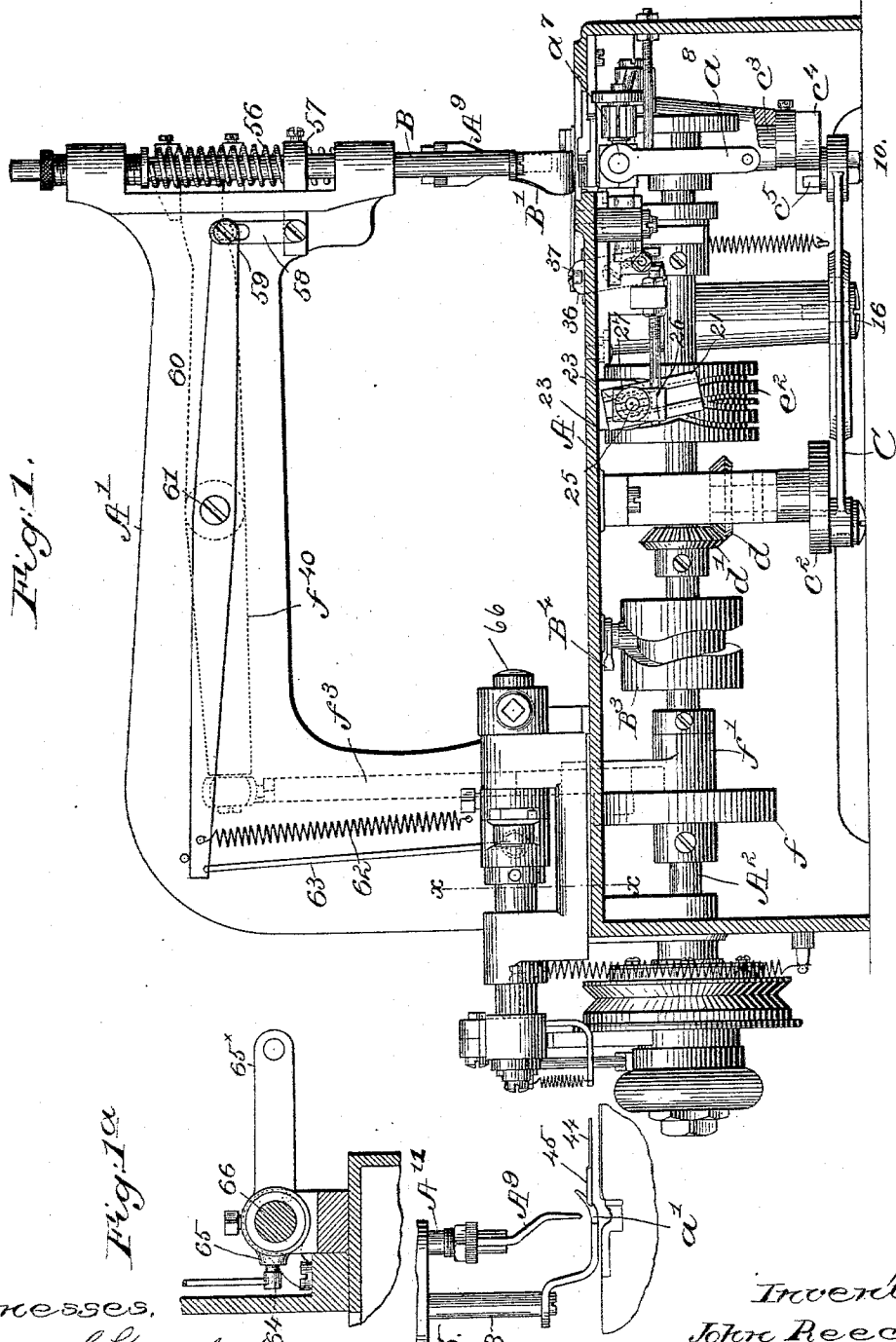
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M. REECE & F. A. SHEA, Administrators.

SEWING MACHINE FOR FINISHING BUTTONHOLE PIECES.

No. 571,796.

Patented Nov. 24, 1896.



Witnesses,

Fried S Greenleaf.
Edward F Allen

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Fig: 5.

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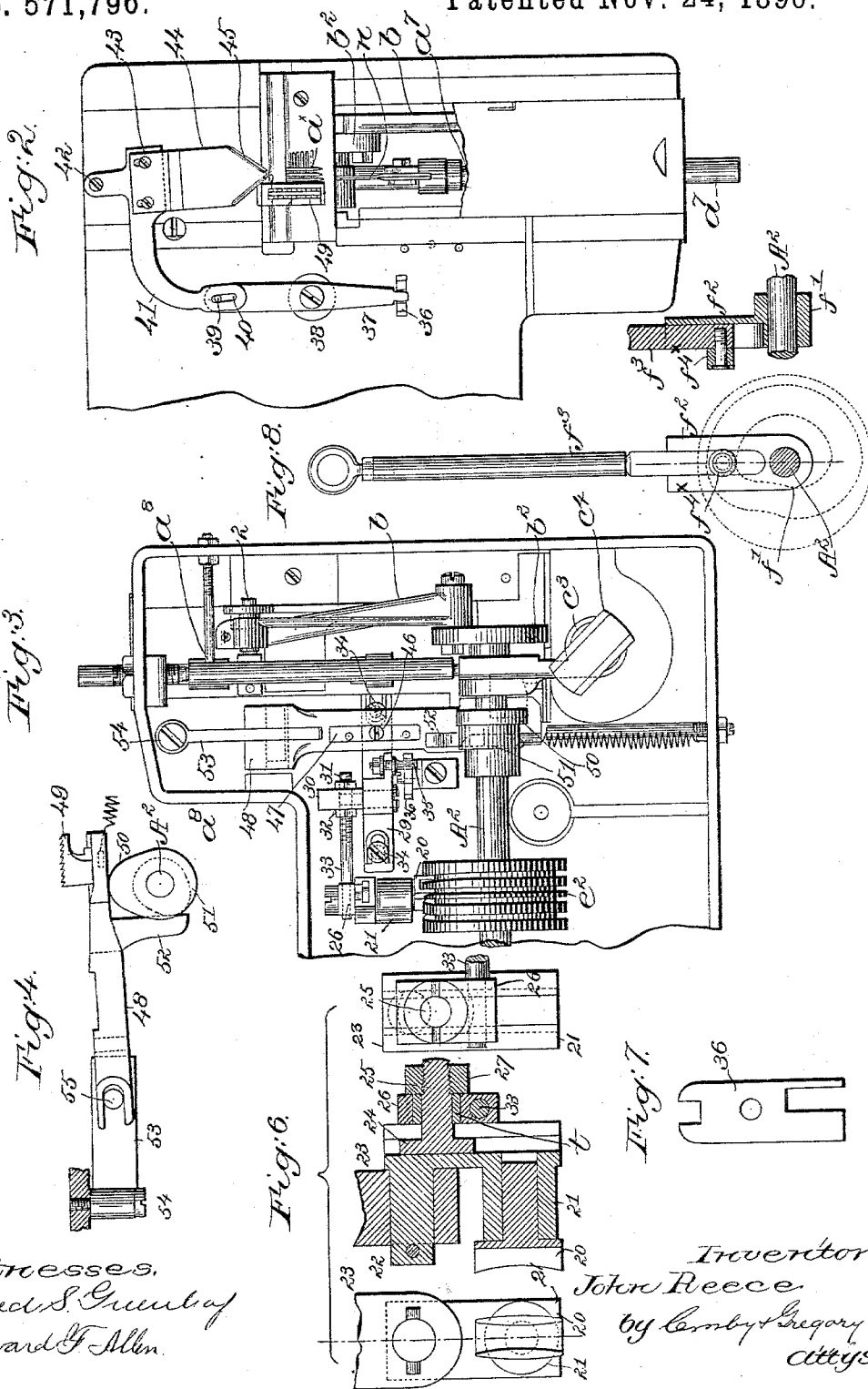
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UNITED STATES PATENT OFFICE.

JOHN REECE, OF BOSTON, MASSACHUSETTS; MARIETTA REECE AND FRANCIS A. SHEA ADMINISTRATORS OF SAID JOHN REECE, DECEASED.

SEWING-MACHINE FOR FINISHING BUTTONHOLE-PIECES.

SPECIFICATION forming part of Letters Patent No. 571,796, dated November 24, 1896.

Application filed October 22, 1891. Serial No. 409,533. (No model.)

To all whom it may concern:

Be it known that I, JOHN REECE, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Machines for Finishing Buttonhole-Pieces, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 United States Patent No. 404,863, granted to me June 11, 1889, shows and describes a machine for finishing buttonholes by stitching down the thrum ends thereof at the under side of the material, the stitch being what is known as a "blind" stitch. The machine

15 referred to employs a bender, and an eye-pointed needle is made to reciprocate and also to vibrate laterally, so that while the needle enters the material at each thrust thereof it by its lateral movements enters the

20 material first at one side of the stay-cord and thrum ends and then at the other side of the stay-cord and thrum ends to bind them upon the back of the material. To simplify the

25 machine made the subject of the said patent, I have devised the machine herein to be described, it containing a needle which has only a movement of reciprocation, but it has a thrum-gatherer which is reciprocated or

30 vibrated laterally, so as to place the thrums first at one and then at the other side of the plane of movement of the needle when entering the material bent by the bender, thus enabling the stitches to be made in a straight

35 line instead of in a zigzag line, the stay-cord and thrum ends being laid zigzag, thus better taking up any slack therein. The feeding mechanism employed has imparted to it

40 usual up-and-forward and down-and-backward movements, and in addition thereto it has also imparted to it a lateral movement in the direction of the movement of the thrum-gatherer, so that the material has imparted to it a positive lateral movement while the

45 thrum-gatherer is moving in the same direction.

The thrum-gatherer shown consists of a spring-plate having a proper guide for the reception and collection of the thrum ends, the

50 said thrum-gatherer receiving directly upon it the buttonhole-piece and being so shaped

as to collect the thrums just in advance of the action of the bender upon the material and in advance of the stitch-making point.

This invention therefore consists in a sewing-machine containing the following instrumentalities, viz: stitch-forming mechanism, a feeding device, a throat-plate having a groove, a bender adapted to enter said groove and bend the material therein, a cam, intermediate devices between said cam and feeding device to vibrate the latter laterally, and devices to actuate said bender, to operate substantially as will be described.

Figure 1 of the drawings represents a rear side elevation of a sewing-machine embodying my invention, the presser-foot being supposed to be held down; Fig. 1^a, a partial section in the line *x*, Fig. 1; Fig. 2, a partial top or plan view of the bed-plate of the machine with the thrum-gatherer in position, the slide-plate being partially broken away to show part of the needle-bar below it. Fig. 3 is a partial under side view of the machine, the connecting rod or lever for moving the shuttle being omitted. Fig. 4 is a detail of the feed. Fig. 5 is a partial front elevation, chiefly to show the thrum-gatherer, the bender, and the presser-foot; Fig. 6, details, enlarged, of the devices actuated by the cross-grooved cam to vibrate the thrum-gatherer and the feed. Fig. 7 shows the lever detached, and Fig. 8 shows details of the connecting-rod between the shaft *A*² and the lever for moving the bender.

The bed-plate *A*; the overhanging arm *A*¹; the main shaft *A*²; its cam *B*³ for operating the take-up *B*⁴; the bevel-pinion *d*¹, engaging the bevel-pinion *d* on an upright shaft provided with a disk *c*², having a crank-pin which is surrounded by a lever or connecting-rod *C*, having its fulcrum on a stud-screw 16 and having at its outer end a stud 10, carried by a block *c*⁵, which enters a groove in an arm *c*⁴ of an upright shaft *c*³ for actuating or rotating a shuttle or under-thread carrier; the crank *b*² at the end of the shaft *A*²; the link *b*; the stud 2 to which it is connected, the said stud projecting from the needle-bar *a*¹, adapted to be reciprocated in a suitable guide *a*³; the bender *A*³, attached to the reciprocating bender-bar *A*⁴; the presser-bar *B*; the

presser-foot B'; the throat *a'*, having a depression in which is pressed by the bender the material before the needle is thrust through it, and the cam *e*², having crossing grooves, are and may be all substantially as in the patent referred to, wherein like letters are employed to designate like parts; but in this present invention the needle-bar frame, instead of being vibrated to move the needle laterally, is held in the same position.

In practice the bender-bar will be operated substantially as provided for in the said patent.

Herein the cross-groove or "double-switch" cam, as it is commonly called, and marked *e*², receives a U-shaped shoe 20, having its shank (see Fig. 6) mounted loosely in a radius-bar 21, having a stud 22 to enter a suitable stand 23 (see the detail Fig. 6) of the bed-plate, the said radius-bar being slotted, as represented in Fig. 6, for the reception of a slide 24, having a threaded screw 25, having a roll *t*, over which is fitted a block 26, and thereafter a nut 27 is applied to the said screw. When the nut is loosened, the slide 24 may be slid in the groove in the radius-bar, and the turning of the nut upon the screw fastens the said slide in any adjusted position, this adjustment being made to determine the throw of the bar 29, it having a projection 30, with which is connected by suitable nuts 31 32 the rod 33, connected in turn to the block mounted loosely on the roll *t*.

The bar 29 is slotted near its ends to receive through it stud-screws 34, so that the said bar may slide horizontally.

The bar 29 has a horizontal stud 35 adjustably connected to it by a suitable nut, the said stud entering a slot or hole in the lower end of a lever 36, (shown separately in Fig. 7, and also in Fig. 1,) the upper end of the said lever, suitably forked or notched, receiving one end of the lever 37, pivoted at 38, and provided with a pin or equivalent 39 to enter a slot 40, or it might be the reverse, in an arm or lever 41, pivoted at 42, and having attached to it by screws 43, preferably in an adjustable manner, a suitable thrum-gatherer 44, the said thrum-gatherer, as herein shown, being a spring-plate having upturned edges or lips 45 to form a converging passage with a narrow outlet, the thrum ends being gathered together by the lips and brought into the narrow passage in compact condition to be presented to the material at the stitch-making point. The slide 29 also has a depending vertical stud 46, which is extended through a slot 47 in the feed-bar 48 to move it laterally, said feed-bar having attached to its forward end at its upper side a feed-block 49, adapted to rise through a slot in the throat *a'* and engage the material to feed the same. This feed-bar 48 is suitably shaped to be acted upon by cams 50 51, the latter being shown by dotted lines in Fig. 4, the cam 50 serving to lift the feed-bar to cause its toothed surface to engage the ma-

terial, while the cam 51, acting against the toe 52 of the feed-bar, causes the same to be moved while in engagement with the material to effect the forward feeding thereof, the said bar at the same time being moved laterally in unison with the lateral movement of the thrum-gatherer, a suitable spring or springs moving the feed-bar in opposition to the said cams. These cams are fast on the main shaft A². The rear end of the feed-bar is bifurcated both vertically and transversely—vertically to embrace a finger 53, pivoted upon a stud-screw 54, screwed into the under side of the bed-plate, the said stud-screw serving as a fulcrum for the said finger, and transversely to receive ears 55, extended from opposite sides of the said finger. This finger and its projections 55 enable the feed-bar to have given to it, in addition to its rising-and-falling and forward-and-back movements, a lateral motion derived from the stud 46 in the slot 47, the material engaged by the feed-points being moved laterally for each stitch, the movement at one stitch being in one and the movement at the next stitch being in the opposite direction, to thus enable the needle-bar, which has only a movement of reciprocation, to pass the needle through a fold of the material held between the under side of the bender A² and in the groove of the throat *a'* first at one side and then at the other side of the thrum ends, in order that the said thrum ends may be stitched down with a blind stitch, substantially as provided for in the said patent; but in this invention, instead of the thrum ends lying in a straight line and the stitch being taken zigzag across them, the stitches are in a straight line and the thrum ends are bent back and forth across the stitches, thus effectually taking up all slack in the thrum ends and stay cord and confining them better and more closely in place.

The throat-plate *a'* is serrated or notched, as at *a*^x, immediately under the presser-foot B', so that when the bender acts to bend the material in the throat *a'*, preparatory to the passage of the needle through a folded portion of the material, the said bender will not act to draw back the material in a direction opposite to that in which the feed moves it when making the stitch.

The presser-foot is normally held down upon the work by means of the spring 56, it acting on a collar 57, attached to the presser-foot bar, and this same collar has attached to it a link 58, provided with a slot to receive a pin 59 of a lever 60, pivoted at 61, the said lever at its opposite end having connected to it a spring 62, preferably stronger than the spring 56, so that the spring 62 normally keeps the presser-foot B' elevated and out of contact with the material.

The outer end of the lever 60 has coöperating with it a rod 63, resting at its lower end upon the inner end 64 of a lever 65, mounted loosely upon a shaft 66, the opposite end 65^x of the said lever being in practice connected

by a rod with a treadle or some other suitable device, so that the operator by putting his foot upon the treadle to actuate the lever 65 may act upon the rear end of the lever 60, thus depressing the front end of the lever, so that the stud 59 in the slot of the link 58 will be moved downwardly and permit the spring 56 to act and force the presser-foot upon the material.

Fig. 1 shows the machine with the presser-foot in the position it will occupy when the rod 63 is elevated by the operator for sewing. The main shaft A² has upon it a cam *f*, the shape of which is shown by dotted lines, Fig. 8. Alongside of this cam the shaft has mounted loosely upon it the hub *f'*, having an arm *f*², grooved to receive the lower end of a connecting-rod *f*³, having a roller or other stud *f*⁴, which enters the groove in one side of the cam *f*. The upper end of this connecting-rod *f*³, as shown by dotted lines, Fig. 1, engages a lever *f*⁴⁰, pivoted upon the overhanging arm A', but at the opposite side of the frame, viewing Fig. 1, the said lever being represented by dotted lines. This lever at its forward end is connected with and so as to operate the bender-bar A'', as provided for in said patent; but herein, instead of using the eccentric and eccentric-strap, as provided for in the said patent, to move the said lever *f*⁴⁰, I have employed the rod *f*², having the roller to enter the cam-groove.

By employing a connecting-rod and a guide, in which it is free to slide, as in this present invention, I am enabled to work the bender-bar with greater ease and with less wear and liability of strain.

I have herein shown, but not specifically described, a clutch mechanism as mounted upon the shaft A², it working through the shaft 66, herein described only as constituting the fulcrum for the lever 65. The shaft 66 controls the movement of the presser-foot, as provided for in United States Patent No. 441,700, dated December 2, 1890.

In operation a buttonhole-piece, having had the buttonholes therein stitched and the thrum ends drawn through to the under side of the material, will be laid upon the thrum-gatherer, so that the thrum ends enter between the flanges 45. The operator will put his foot upon the treadle referred to and lift the rod 63 to permit the spring 56 to lower the presser-foot B' upon the material just in advance of the thrum-gatherer. This movement by the operator to permit the presser-foot to descend automatically starts the machine, as provided for in the said patent, and the bender bends the material down into the groove *a'* of the throat, so that the needle *n*, carried by the needle-bar *a*⁷, will enter the bent material at one side of the thrum ends, and the loop formed by the needle will be entered by the shuttle or other cooperating device, and the needle will then be retracted, and immediately afterward the cam *e*², through the devices described, by moving the slide 29, will

oscillate the lever 36, causing it to vibrate, through the thrum-gatherer-actuating devices, the thrum-gatherer, placing its mouth at the opposite side of the path of the needle, and at the same time the feeding device will rise, engage the material, and move it laterally, and then the feeding device will feed the material for the length of a stitch. During this feeding operation the bender will rise to release the material, and the material having been fed and put into the position described the needle will make another movement and enter the material to form another stitch, but at this time it will enter the material at the opposite side of the collected thrums.

By moving the thrum-gatherer laterally instead of vibrating the frame in which the needle-bar reciprocates I am enabled to make a simpler and more durable machine, one which may be more readily adjusted and adapted to different varieties of work which the machine has to do in factories, and, as before stated, the work done is superior.

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

1. In a sewing-machine for stitching thrum ends, the following instrumentalities, viz: stitch-forming mechanism, including a needle having only a right-line movement; a thrum-gatherer; actuating mechanism to vibrate said thrum-gatherer laterally with relation to the line of stitching; a throat-plate having a groove; a bender adapted to enter said groove and bend the material therein; means to actuate said bender; a feeding device, and means to impart to said feeding device in addition to its regular feeding movement a lateral movement first in one and then in the opposite direction following the movement of the thrum-gatherer to operate, substantially as described.

2. In a sewing-machine for stitching thrum ends, the following instrumentalities, viz: stitch-forming mechanism; a feeding device; means to operate it to feed the goods forward, and means to vibrate said feed device laterally to the line of forward feed; a thrum-gatherer; actuating mechanism to vibrate said thrum-gatherer laterally with relation to the line of stitching; a throat-plate having a groove; a bender adapted to enter said groove and bend the material therein; devices to actuate said bender; a presser-foot; and a throat-plate serrated or notched as at *a*^x immediately under the presser-foot, the latter acting to hold the material and prevent it slipping backwardly during the action of the bender, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN REECE.

Witnesses:

G. W. GREGORY,
FRANCES M. NOBLE.