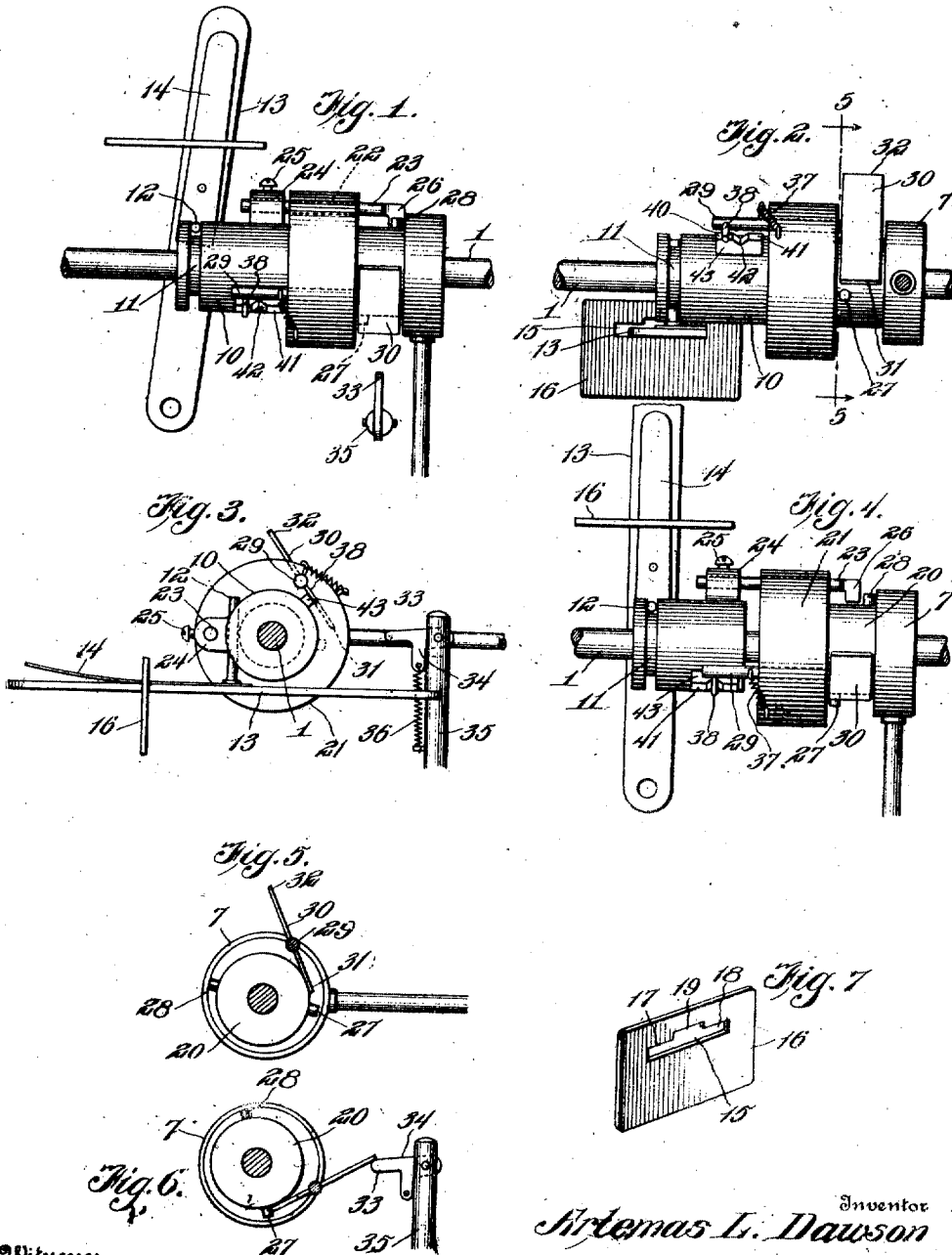


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FEED MECHANISM FOR SEWING MACHINES.
APPLICATION FILED MAY 25, 1909.

1,002,652.

Patented Sept. 5, 1911.

2 SHEETS—SHEET 1.



Witnesses

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Fig. 8.

1, 3, 4, 5, 6, 7, 8, 9

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UNITED STATES PATENT OFFICE.

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FEED MECHANISM FOR SEWING-MACHINES.

1,002,652.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ARTEMAS LORD DAWSON, a citizen of the United States, residing at Deval Bluff, in the county of Prairie and State of Arkansas, have invented new and useful Improvements in Feed Mechanism for Sewing-Machines, of which the following is a specification.

This invention relates generally to feed mechanism for sewing machines, and particularly to a means for controlling the action of the fabric feeding device.

The object of the invention is to provide a means whereby the direction of feed motion of the feed plate or device may be reversed for stitching backward and to secure the ends of a seam against loosening or raveling, or sew a zigzag or irregular seam without turning the fabric; or whereby the feed plate or device may be reciprocated back and forth to sew any one stitch over and over at one point and make what I term a "shuffle" stitch to tie or lock the thread against raveling.

The invention consists of the features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a front elevation of the parts of a feed mechanism embodying my invention, showing such parts in normal position. Fig. 2 is a bottom plan view of the same. Fig. 3 is an end elevational view. Fig. 4 is a view similar to Fig. 1 showing the parts shifted for producing the shuffle stitch. Figs. 5 and 6 are cross sectional views on line 5—5 of Fig. 2 showing the auxiliary pawl in different positions in its orbit of movement. Fig. 7 is a view of the latch plate. Fig. 8 is a view showing one of the many applications of the invention to a feed mechanism.

Referring to the drawing, the numeral 1 designates a shaft of the machine on which is a cam or eccentric 2, which, through the medium of a rod or pitman 3, communicates motion to a rock shaft 4 carrying a crank or rocker arm 5 which imparts a vertical oscillatory motion to the feed bar or plate 6. The shaft 1 also communicates motion in the ordinary manner through any suitable known type of operating means to the needle

bar of the machine. Also mounted on the shaft 1 is a cam or eccentric 7 which communicates motion through a rod or pitman 8 to a rock shaft 9 which reciprocates the feed bar or plate 6 back and forth. These parts operate in timed accord with the aforesaid parts for imparting vertical reciprocatory motion to the feed bar or plate, and are controlled in action by my improved feed controlling means for the purposes described.

Loosely mounted on the shaft 1 is a sliding sleeve 10 provided at one end with an annular groove 11 receiving a pin or projection 12 on a shifting lever 13, by which said sleeve may be longitudinally adjusted on the shaft. The lever is pivotally mounted at its lower end on the frame of the machine in any suitable manner for movement in a direction parallel with and longitudinally of the shaft, and carries a spring plate locking latch 14. The upper end of the lever and the free end of the latch pass through a slot 15 in a latch plate 16 fixed to the frame of the machine. The free end of the spring dog is normally movable away from the lever to engage the end portions 17 and 18 of the front wall of the slot or to engage an intermediate notch or recess 19 therein for the purpose of locking the sleeve in different positions, as hereinafter described.

Keyed or otherwise fixed to the shaft between the sleeve 10 and a laterally extending clutch collar 20 on the head of the eccentric 7 is a clutch collar or member 21 having a transverse opening 22 for passage of a stem 23, one end of which also passes through an opening in a lug 24 on the sleeve 10 and is adjustably and detachably secured thereto by a set screw 25. The opposite end of the stem carries a lug or projection 26 which is adapted to engage either one of two pins or projections 27 and 28 arranged at an angle of about 180° apart on the collar 20 and on opposite sides of the circumferential center of said collar. The eccentric head and its collar 20 are loosely mounted on the shaft 1, and the stem 23 and its projection 26 provide a pawl adapted to engage the pins or teeth 27 and 28 to form a clutch connection for transmitting a continuous motion from the shaft to the eccentric 7.

A stem 29 is mounted to rock or oscillate upon the collar 21 and extends at each end beyond the same. One end of this stem carries a pawl plate 30 intermediately mounted thereon to provide an arm 31 to engage the pins 27 and 28 and an arm 32 adapted to be engaged by the finger 33 of a bell crank trip member 34 pivotally mounted upon a post 35 fixed to the frame of the machine and normally held depressed in operative position by a spring 36. In such position the trip is rigid to engage and retract the pawl plate 30, but the spring permits said trip to yield upwardly and permit passage of the pawl plate when the shaft is rearwardly rotated for any purpose, as in effecting an adjustment of the needle bar. The pawl plate is of sufficient width to engage either one of the pins 27 and 28, and its stem 29 is connected by a spring 37 with the collar 21, which spring tends to turn the stem to throw the engaging arm of the pawl into the path of either one of said pins.

The opposite end of the stem 29 projects over the collar 10 and is provided with a pin or projection 38 to engage opposite plain surfaces 40 or 41, or an intermediate notch 42 in a lug 43 projecting radially from said collar, the construction being such that the pin 38 is in engagement with one of the surfaces 40 and 41 when the spring latch 14 of the lever 13 is in engagement with the portion 17 or 18 of the locking plate 16, while the pin is in engagement with the notch 42 when the spring latch occupies the recess 19 of the locking plate.

It will be understood from the foregoing description that the tooth 26 of the pawl 23 may be in engagement with either pin 27 or 28 in the arrangement of the parts of the mechanism for the forward or backward feed of the fabric or goods, as the case may be, in sewing a seam. Assuming that the parts are in the position shown in Fig. 1, in which the lever 13 is shifted so that the latch bears against the surface 17 and the pawl tooth 26 is in engagement with the pin 28, while the pin 38 is in engagement with the surface 40 of the lug 43 to hold the pawl 30 retracted, the operator on reaching the end of the seam by shifting the lever 13 to its opposite position in which the latch 14 engages the surface 18, the tooth 26 of the pawl 23 shifted out of engagement with the pin 28 to a position to engage the pin 27 and the pin 38 shifted into engagement with the surface 41 of the lug 43 to hold the pawl 30 still retracted, will disconnect the eccentric 7 from the shaft 1 so that the shaft 26 comes into engagement with the pin 27 and again couples said eccentric to the shaft. During this period of half revolution of the shaft the mechanism operated by the eccentric 2 will continue in action, so that upon

the engagement of the tooth 26 with the pin 27 the feed bar or plate 6 will be set in a position for transmitting a backward feed motion to the goods or fabric. A reverse seam may thus be sewed in the fabric for any distance from the end of the seam, to either double the strength of the seam, or to tie or lock the end of the thread, which latter may then be severed to free the fabric. If the tooth 26 should be in engagement with the pin 27 when the parts of the feed mechanism are arranged for action to feed the fabric forward in sewing the seam, the reverse motion of the fabric may be obtained by shifting the lever to the reverse position from that shown in Fig. 1, so as to move the spring latch 14 from engagement with the surface 17 into engagement with the surface 18 of the locking plate. By this means the tooth 26 will be brought into a position to engage the pin 28 and the eccentric 7 will be disconnected from the shaft 1 during a period of a half revolution of the latter to set the mechanism for a reverse feed motion of the fabric in the manner previously described. A shifting of the operating lever to its opposite position from the reverse feed motion position, wherever that may be, will restore the parts to a position for normal or forward feed motion, as will be readily understood.

It is desirable under some conditions to tie or lock the thread in a different manner from that described in order that the thread may be tied within the length of a single stitch, which is accomplished by adjusting the feed mechanism to reciprocate the feed plate back and forth to stitch over and over through the fabric at one point and make what I term a "shuffle" stitch. In adjusting the feed mechanism for this operation, the lever 13 is moved to a central position in which the latch 14 engages the notch 19 of the locking plate 15. This adjustment brings the tooth 26 of the pawl 23 to an intermediate position on a line between the pins 27 and 28 so that it will not engage therewith, while at the same time the pawl 30 will be adjusted so as to permit the pin 38 to enter the recess 42, whereby the spring 37 may act to turn the pawl 30 to bring the edge of its operating arm 31 into engagement with the adjacent pin 27 or 28, whichever it may be, and to bring its trip arm 32 into position to be engaged by the finger 33 of the trip device 34 on each revolution of the shaft 1. Assuming that the pawl engages the pin 27, it will be understood that the parts will be set for a reverse motion of the fabric the length of a single stitch, at which time the arm 32 will engage the finger 33, by which the pawl 30 will be tilted and released from engagement with the pin 27. The eccentric 7 will thus remain at rest for a half revolution during the time of the

stitch, or until the pawl engages the pin 28, whereby the feed plate will be reciprocated in the reverse direction, at the end of which motion the pawl will again be retracted by the trip device. In this manner the pawl will alternately engage the two pins 27 and 28 to effect the reciprocation of the feed plate to move the fabric back and forth the length of a single stitch at proper intervals to stitch over and over through the fabric at a single point, thus locking the end of the thread in an effective manner. After the thread is severed for the release of the fabric, the mechanism may be shifted for a forward feed motion in the manner previously described. By adjusting the mechanism the thread may be tied or locked at the beginning or end of the seam in either of the ways described, as will be readily understood.

In making a garment or other article consisting of several or many parts, two or more of the parts, after having been sewed together, may have to be handled many times before all these parts are united to form the complete garment. In this repeated handling of the unfinished parts, the ends of the seams are subjected to more or less strain, which loosens the stitches at the ends of the seams, and if the threads of the seams have been cut off close to the fabric, one or more of the stitches may ravel out. To avoid this, careful operators leave a sufficient length of loose or free thread at each end of a seam and then tie the loose ends to form a knot, to prevent raveling. This loss of thread and time is avoided by my invention, since, having either shuffle stitched or backward stitched the end of the seam, the thread is effectually locked against raveling and the threads may be cut off close up to the fabric. Further, when it is desired to sew a zigzag seam across a piece of fabric, to either strengthen or stiffen it, my mechanism renders the operation easy and rapid, by avoiding the repeated reversals of the fabric that are necessary in sewing machines as ordinarily constructed.

Claims:

1. In a sewing machine, the combination with a feed mechanism embodying a reciprocating feed device having a feed motion in a determined plane for normally feeding the fabric forward, of means for controlling said mechanism to automatically reciprocate said feed device alternately back and forth in its normal plane of movement within the range of a single stitch to impart a corresponding back and forth feed motion to the fabric.

2. In a sewing machine, a feed device having a longitudinal feed motion for normally feeding the fabric forward, operating means therefor, and controlling means for regulating the action of said operating means to

automatically reciprocate the feed device back and forth in its normal plane of movement for alternately feeding the fabric backward and forward within the range of a single stitch.

3. In a sewing machine, a feed bar, means for horizontally and vertically reciprocating the same in fixed paths, means for varying one of said motions relative to the other to reverse the direction of feed motion of said bar, and means for alternately varying such motions relative to each other to automatically and alternately reverse the feed motions of the bar in its normal plane of movement within the range of a single stitch.

4. In a sewing machine, a feed bar, means for horizontally oscillating said bar, means for vertically oscillating said bar, said means operating to horizontally and vertically oscillate the bar in fixed lines, means for automatically changing the action of the latter named means to change the direction of feed motion of the bar, and manually controlled means for setting said automatic means for action.

5. In a sewing machine, a feed bar having a vertical and a back and forth horizontal oscillating motion in a direct line, automatic means for varying one of said motions relative to the other to change the direction of feed motion of the bar in said line, and controlling means for setting said automatic means for action.

6. In a sewing machine, the combination with the feed bar, and devices for vertically and horizontally oscillating said bar, of means for temporarily arresting the means for horizontally oscillating said bar for automatically alternately reversing the direction of feed movement thereof.

7. In a sewing machine, the combination with a feed bar, of devices for horizontally oscillating the bar, devices for vertically oscillating the bar, and automatic means for producing a relative lost motion between the devices to reverse the direction of feed motion of the bar.

8. A sewing machine embodying a feed bar, means for vertically oscillating the bar, means for horizontally oscillating the bar, means for controlling the horizontally oscillating means to reverse the direction of feed motion of the bar to feed the fabric backward, and means for controlling said horizontally oscillating means for alternately reciprocating the feed bar back and forth to impart a corresponding motion to the fabric.

9. In a sewing machine, a feed bar having a vertical and a horizontal oscillating motion, cam-actuated devices for producing such motions, means for controlling the operation of one of said cam-actuated devices with respect to the other to automatically reverse the direction of feed motion of the

bar, means for setting said controlling means for operation, and means for shifting said setting means.

10. In a sewing machine, the combination
5 of a main shaft, a feed bar, means for horizontally oscillating the bar including a cam on the shaft, said cam being provided with a clutch member having spaced contacts, a coacting clutch member on the shaft for
10 engaging either of said contacts, and means for automatically shifting the latter named clutch member.

11. In a sewing machine, the combination
15 of a main shaft, a feed bar, means for horizontally oscillating the bar including a cam on the shaft, said cam being provided with a clutch member having spaced contacts, a coacting clutch member adapted to engage said
20 contacts, and means for controlling said coacting clutch member to alternately engage said contacts.

12. In a sewing machine, the combination
25 of a main shaft, a feed bar, means for horizontally oscillating the feed bar including a cam loose on the shaft and provided with spaced contacts, a member fixed to the shaft and carrying a dog adjustable to engage
30 either of said contacts, means for adjusting said dog, a pawl carried by said fixed member for cooperation with the contacts, means for alternately throwing said pawl into and out of action, and means for rendering said
pawl inoperative.

13. In a sewing machine, the combination
35 with a fabric feeding device, and operating mechanism for horizontally and vertically oscillating said device in fixed paths, of means for controlling said mechanism to vary such oscillating motions to adjust the
40 feeding device for a continuous backward and forward feed motion, and means for controlling said feed mechanism to vary the oscillating motions to adjust the feeding device for a constant back and forth feed motion
45 in its paths of action and within the range of a single stitch.

14. In a feeding mechanism for sewing machines, the combination of a drive shaft,
50 a feed bar, eccentrics, one fixed to and the other loosely mounted on the shaft, means actuated by said eccentrics for vertically and horizontally oscillating the feed bar, and a clutch connection between the shaft and loose eccentric controllable to set said
55 eccentric to transmit a forward or backward feed motion to the feed bar or a reciprocatory feed motion to said bar.

15. In a feeding mechanism for sewing machines, the combination of a drive shaft,
60 a feed bar, an eccentric loosely mounted on the shaft, connecting means between the eccentric and feed bar for oscillating the latter, a clutch connection between the shaft and eccentric for reversing the direction of

feed motion of the bar, said clutch connection embodying a loose member having circumferentially spaced peripheral contacts, a fixed member carrying a dog adjustable to engage either contact, and a manually operable controlling device for adjusting said
70 dog.

16. In a sewing machine, a feed bar having a vertical and a horizontal oscillatory motion, automatic means for varying the horizontal oscillatory motion relative to the
75 vertical oscillatory motion to change the direction of feed motion of the bar, and controlling means for setting said automatic means for action.

17. In a feeding mechanism for sewing
80 machines, the combination of a drive shaft, a feed bar, actuating means for the bar including an eccentric loosely mounted on the shaft and provided with circumferentially spaced contacts, a pawl carried by the shaft
85 to engage said contacts, and means for shifting said pawl into engagement with either contact.

18. In a feeding mechanism for sewing machines, the combination of a drive shaft,
90 a feed bar, means for operating said bar including an eccentric loose on the shaft and provided with circumferentially spaced contacts, a pawl carried by the shaft to engage said contacts, means for shifting said
95 pawl to engage either contact, a second pawl adapted to engage the contacts, and automatic means for alternately shifting said second pawl into and out of engagement with the contacts.

19. In a feeding mechanism for sewing machines, a feed bar, means for operating the feed bar including a drive shaft, an eccentric loose on said shaft and provided with spaced contacts, a pawl carried by the said
105 shaft and tripable to alternately engage said contacts, and means for automatically tripping said pawl.

20. In a feed mechanism for sewing machines, the combination of a drive shaft, a
110 feed bar, means for operating the bar including an eccentric loose on the shaft and provided with spaced contacts, a pawl carried by the shaft and adjustable to engage either contact, a second pawl operating to
115 alternately engage the contacts, means for automatically tripping the said pawl, and means for adjusting the pawl, said means being operative to render the second pawl inoperative when the first pawl is in
120 engagement with either contact.

21. In a feeding mechanism for sewing machines, the combination of a feed bar, means for oscillating the same, a clutch device forming part of said means for varying the feed motion to move the bar either
125 forward or backward on such motion, or to impart an alternate back and forth feed

motion thereto, and means for controlling said clutch device for the purposes set forth.

22. In a feeding mechanism for sewing machines, the combination of a drive shaft, a feed bar, means for oscillating the same including fixed and loose clutch members mounted on the shaft, means for setting said clutch members for securing a backward or forward feed motion of said feed bar, and means for setting said clutch members to secure an alternate back and forth feed motion of said bar.

23. In a sewing machine, a feed bar having vertical and horizontal oscillatory motion, a drive shaft, means for operating the bar including relatively fixed and loose eccentrics on the shaft, a clutch member on the loose eccentric having spaced contacts, a clutch member on the shaft, carrying a device to engage said contacts, and means for

relatively adjusting said clutch members to set said device with either contact.

24. In a sewing machine, a driving shaft, a feed bar having vertical and horizontal oscillatory movements, devices for operating the same including relatively fixed and loose eccentrics on the shaft, a clutch member on the loose eccentric, a coacting clutch member on the shaft, one of said clutch members being provided with a pair of spaced contacts and the other with a device to engage the same, means for adjusting said device to engage one or the other of said contacts, and means for automatically throwing said device out of engagement with the contacts.

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

ARTEMAS L. DAWSON.

Witnesses:

C. C. HINES,

JOHN L. FLETCHER.