July 27, 1954 W. M. LITTLETON 2,684,650

AUTOMATIC ATTACHMENT FOR ZIGZAG SEWING MACHINES

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FIG. 1.

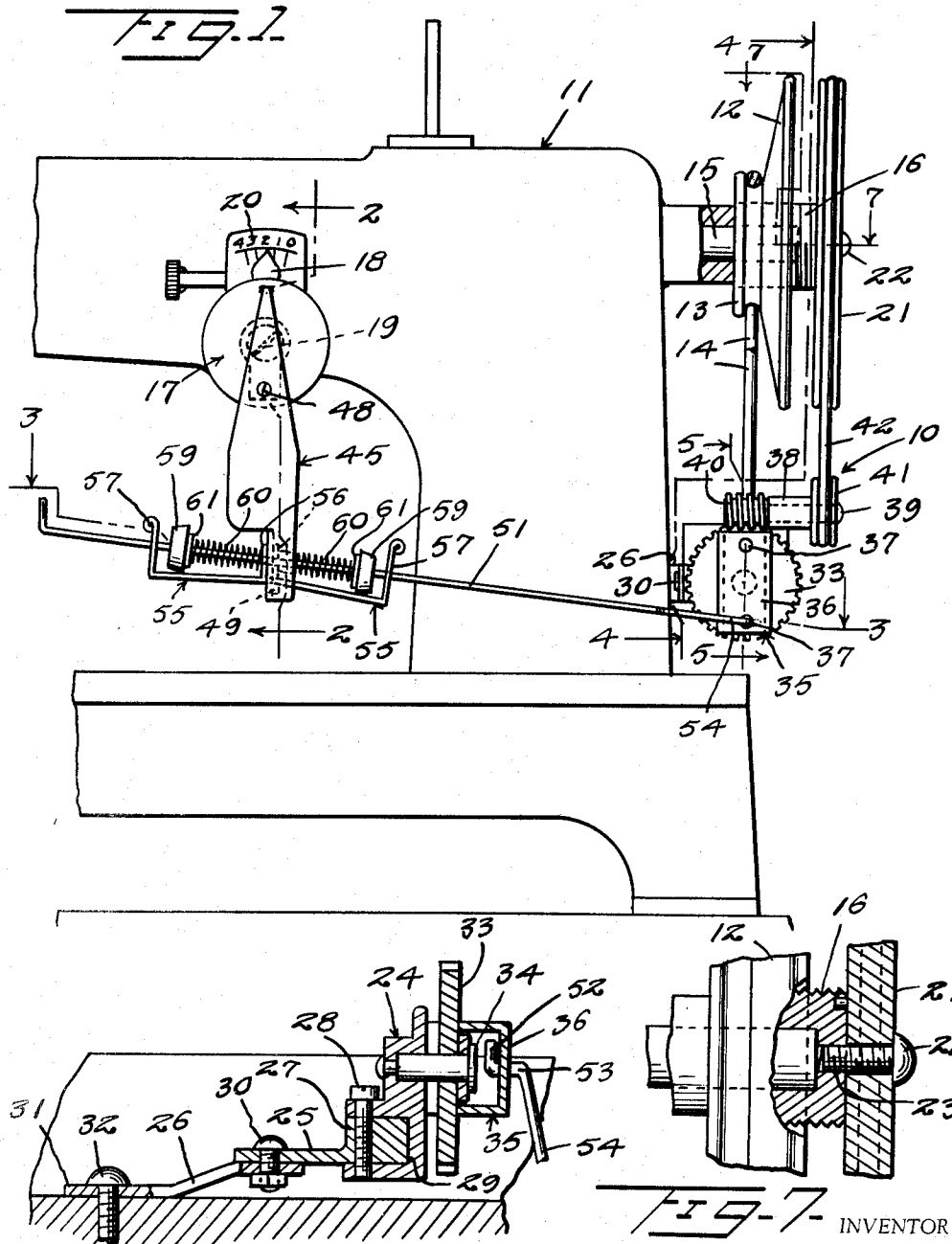






FIG. 6.

FIG. 7.

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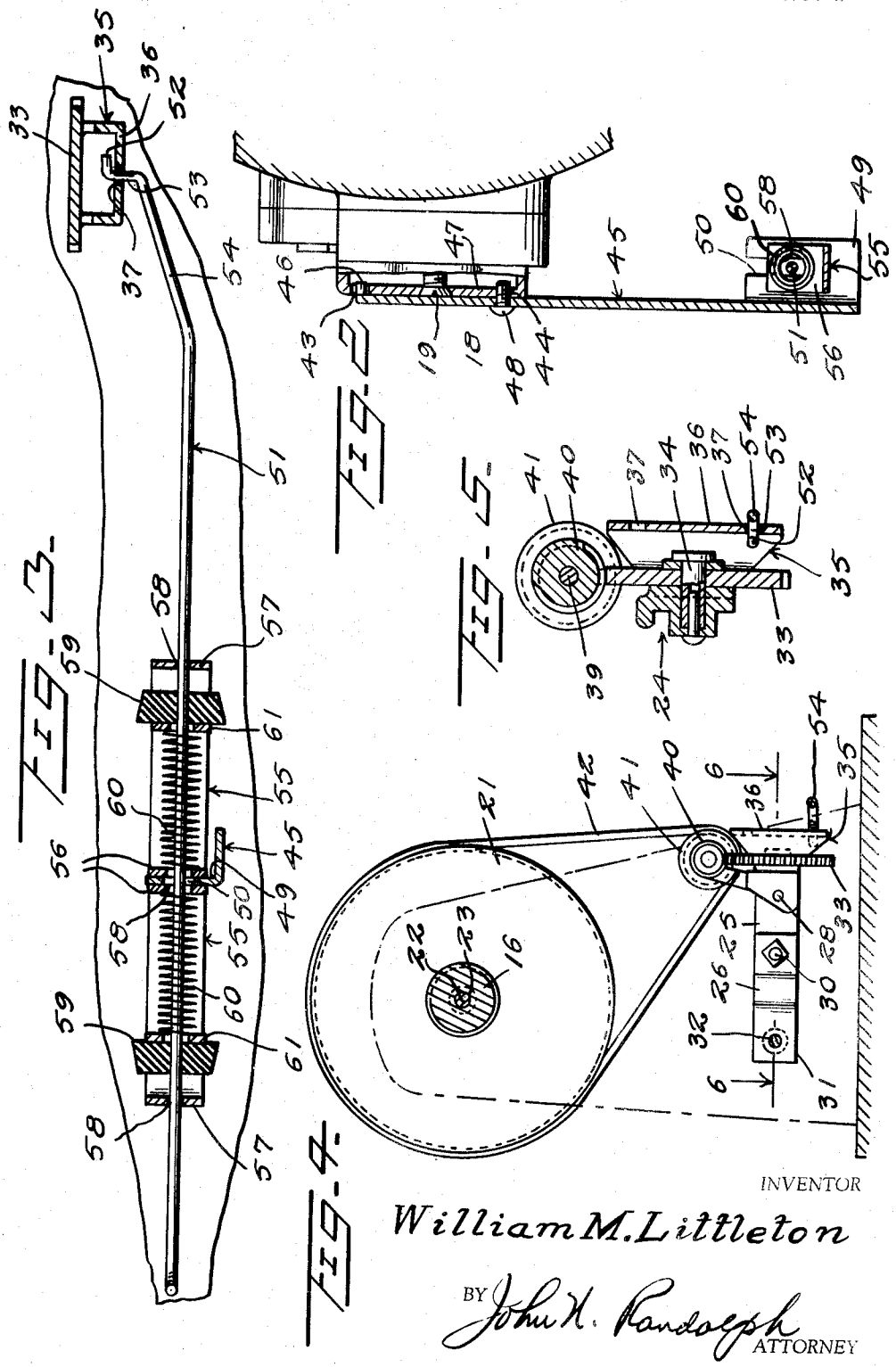


FIG. 3.

FIG. 2.

FIG. 5.

FIG. 4.

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## AUTOMATIC ATTACHMENT FOR ZIGZAG SEWING MACHINES

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6 Claims. (Cl. 112—158)

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This invention relates to a novel attachment for a sewing machine and more particularly to an attachment for use with a sewing machine having a zigzag control capable of being set by means of a pointer movable over a dial for causing the machine to produce a zigzag stitching of varying widths depending upon the setting of the pointer, and whereby the attachment will cause adjustment of the zigzag setting as the stitching is being produced to accomplish an ornamental zigzag stitching having undulating or wavy side edges spaced different distances apart uniformly throughout the length of a seam or line of stitching.

More particularly, it is an aim of the present invention to provide an automatic attachment of extremely simple construction for sewing machines constructed for producing zigzag stitching and whereby the attachment is driven by a movable part of the sewing machine in unison therewith to accomplish uniform variations in the width of a seam or line of stitching produced by the machine.

Another object of the invention is to provide an automatic actuator attachment for a zigzag unit of a sewing machine for producing an ornamental seam or stitch row of varying widths.

A further object of the invention is to provide a sewing machine attachment for varying the widths of a seam or line of stitching produced thereby which may be quickly and easily attached to or removed from a sewing machine and which may be disconnected or connected to the machine without being detached therefrom for use of the attachment with the sewing machine or for use of the sewing machine independently of the attachment.

Another object of the invention is to provide an automatic actuating attachment for a zigzag unit of a sewing machine which may be adjusted for varying the configuration of a seam or line of stitching produced by the machine.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a front elevational view of the attachment shown in an applied position on a portion of a sewing machine;

Figure 2 is an enlarged vertical sectional view taken substantially along a plane as indicated by the line 2—2 of Figure 1;

Figure 3 is a longitudinal horizontal sectional view of a portion of the attachment taken substantially along a plane as indicated by the line 3—3 of Figure 1 and on an enlarged scale;

Figure 4 is a transverse sectional view taken substantially along a plane as indicated by the line 4—4 of Figure 1;

Figure 5 is an enlarged cross sectional view taken substantially along a plane as indicated by the line 5—5 of Figure 1;

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Figure 6 is an enlarged horizontal sectional view taken substantially along a plane as indicated by the line 6—6 of Figure 4, and

Figure 7 is an enlarged fragmentary sectional view, partly in top plan, taken substantially along a plane as indicated by the line 7—7 of Figure 1.

Referring more specifically to the drawings, for the purpose of illustrating a preferred application and use of the zigzag actuating attachment, designated generally 10 and comprising the invention, a portion of a conventional zigzag sewing machine is illustrated in the drawings and designated generally 11, including a conventional sewing machine balance wheel 12 having a pulley portion 13 over which an endless belt 14 is trained for driving said balance wheel and the balance wheel shaft 15 connected thereto. The belt 14 is also trained over the pulley of the motor shaft, not shown for supplying power to drive the balance wheel and balance wheel shaft. The balance wheel 12 is provided on its outer side with a conventional clutch release 16. A conventional zigzag control 17 is mounted on the front of the sewing machine 11 and includes a pointer 18 which is pivotally mounted intermediate of its ends on a pivot 19 for oscillating movement about a horizontal axis across a dial face 20 which is suitably calibrated to indicate adjustments of the zigzag unit by adjustment of the pointer 18 to cause the machine 11 to produce a line or row of stitching of any desired width, all as is conventional.

The zigzag actuator comprising the invention designated generally 10 includes a relatively large pulley wheel 21 having a threaded fastening extending centrally therethrough. Said fastening 22, as best seen in Figure 7, is threaded into a tapped recess 23 formed axially in the clutch release 16 for the purpose of mounting the pulley 21 detachably against the outer end of said clutch release for rotation with the balance wheel 12.

A bracket 24 is supported below the balance wheel 12 and adjacent the front of the sewing machine by means of connected supporting arms 25 and 26. An enlarged end 27 of the supporting arm 25 is adjustably secured by means of a fastening 28 in a recess 29 of the bracket 24. The opposite end of the supporting arm 25 is adjustably clamped to one end of the supporting arm 26 by nut and bolt fastenings 30. The other, inwardly offset end 31 of the arm 26 is secured by a fastening 32 tightly against an end of the housing of the sewing machine 11 and whereby said arm may be supported at any desired angle. The fastening 32 may constitute one of the fastenings for mounting the sewing machine motor bracket, not shown. It will thus be readily apparent that the arms 25 and 26 may be adjusted relatively to one another and to the bracket 24 and the sewing machine for adjusting the bracket 24 upwardly or downwardly and to a certain extent forwardly or rearwardly of the sewing machine. A worm wheel 33 is rotatably mounted on a front

side of the bracket 24 by means of an axle 34 which is secured to the bracket 24 and on which said worm wheel is journaled. A channel member 35 is secured to the outer face of the worm wheel 33 in any suitable manner and has an outer portion defining a plate 36 which is spaced outwardly from the worm wheel 33 and which is provided with at least one opening 37 which is eccentrically disposed relatively to the axle 34 defining the axis of the worm wheel 33.

The bracket 24 is provided with an upwardly offset bearing 38 disposed above and to one side of the top center of the worm wheel 33 and in which the intermediate portion of a shaft 39 is journaled. A worm 40 is fixed to one end of the shaft 39 and is disposed above and in meshing engagement with the worm wheel 33. A small belt pulley 41 is fixed to the other end of the shaft 39. An endless belt 42 is trained over the belt pulley 41 and the larger belt pulley 21 for driving the worm and worm wheel from the balance wheel 12. It will be understood that any other suitable drive could be provided for imparting rotation to the shaft 39 for the balance wheel 12.

For the purpose of mounting the attachment 10, the pointer 18 is provided with an opening 43 above its pivot 19 and a tapped opening 44 therebeneath. An actuating arm or lever 45 has an upper end provided with an inturned projection 46 which fits in the upper opening 43. The lever 45 is provided with an opening 47 which aligns with the tapped opening 44 to loosely receive a headed fastening 48 which extends inwardly therethrough and threadedly engages the opening 44 to thereby detachably secure the actuating lever 45 to the pointer 18 above and below its pivot 19 by means of the single fastening 48. The lever or arm 45 is provided at its lower end with an angularly turned flange 49 which is disposed at substantially a right angle to the plane of said lever and which is provided with a slot 50 opening outwardly of its upper edge.

A connecting rod 51 has a laterally offset terminal 52 formed by a portion 53 which is disposed at substantially a right angle to the axis of the rod 51. The terminal 52 is inserted inwardly through the opening or one of the openings 37 to assume a position on the inner side of the plate 36 and substantially parallel to the plane thereof, as illustrated in Figure 3, and so that the rod portion 53 will be journaled in said opening 37. The rod 51 may be provided with an oblique portion 54 extending from the outer end of the portion 53 in a direction away from the plane of the plate 36, for offsetting the rod 51 away from the sewing machine 11. A pair of metal strips 55 are disposed in end-to-end relationship beneath the rod 51 and are provided with upturned adjacent ends 56 and corresponding upturned remote ends 57. Said ends 56 and 57 are apertured as seen at 58 to slidably accommodate the connecting rod 51 which extends loosely therethrough. A pair of spring stops 59 which are preferably formed of rubber are mounted on the connecting rod 51 and are frictionally maintained in adjusted positions thereon between and adjacent the end portions 57. Two expansion coiled springs 60 are mounted on the connecting rod 51 between the spring stops 59 and the upturned adjacent strip portions 56. A metal washer 61 is preferably disposed between each adjustable stop 59 and the spring end located adjacent thereto. The spring stops 59 are adjusted so that the springs 60 are maintained under tension to urge the strip portions 56 toward one another and into engagement with the wall or flange 49 which is disposed therebetween.



Assuming that the sewing machine 11 is operated in a conventional manner and that the attachment 10 is connected thereto, as illustrated in Figure 1, it will be readily obvious that the disk 21 will be caused to revolve in unison with the balance wheel 12 and through the belt connection 42 will drive the pulley 41, shaft 39 and worm 40 to thereby revolve the worm wheel 33 and the plate 36 connected thereto. Since the connecting rod 51 is eccentrically connected by means of one of the openings 37 to the plate 36 and thus to the worm wheel 33, rotation of the worm wheel 33 will impart a reciprocating motion to the connecting rod 51. As the connecting rod 51 moves from right to left the right hand spring 60 is initially compressed and thereafter causes the lever 45 to swing clockwise so that the pointer 18 moves toward or to the right hand extremity of the dial 20. As the connecting rod 51 thereafter moves to the left in the opposite direction, the other left hand spring 60 is initially compressed and thereafter swings the lever 45 counterclockwise to cause the pointer 18 to swing past its intermediate position of Figure 1 and toward or to the left hand extremity of the dial 20. The springs 60 are under partial tension when the lever 45 is in an intermediate position, as illustrated in Figure 1, so that both springs are under partial tension at all times. The oscillating motion thus imparted to the lever 45 and pointer 18 causes the zigzag control unit 17 to be varied in its adjustments constantly while the sewing machine is in operation so that a seam or row of stitching is produced by the sewing machine 11 the two side edges of which are of undulating or wavy configurations so that the width of the row of stitching or seam, not shown, increases and diminishes in width. The distance between the wide and narrow portions of the seam or stitching row may be varied by utilizing pulleys 21 of different diameters and which may be interchangeably mounted when the clutch member 16 thus providing an attachment by means of which stitching of various ornate designs may be produced to thus increase the utility of the zigzag unit 17 which is normally merely adjusted to vary the width of a seam or row of stitching and which when in an ordinary adjusted position merely produces a seam or row of stitching of a desired width.

It will be readily apparent that one or both of the fastenings 30 and 32 may be loosened for angularly adjusting the arms 25 and 26 relatively to one another or for angularly adjusting said arms relatively to the sewing machine 11 for moving the belt pulley 41 toward or away from the pulley 21 to adjust the tension on the belt 42, after which the fastenings 30 and/or 32 may be re-tightened to secure the pulley 41 in its readjusted position.

When it is not desired to use the attachment 10 with the sewing machine 11, the belt 42 can be removed and by grasping and displacing the two upright strip ends 57 away from one another, the inner strip ends 56 are displaced out of engagement with the lever wall 49 so that the rod 51 may be swung upwardly about its portion 53 as an axis for displacing the rod out of engagement with the slot 50. The attachment 10 is thus capable of being disconnected from the sewing machine in a few seconds to enable the sewing machine to be utilized in a conventional manner including a conventional

use of the zigzag unit 17. Similarly, the attachment 10 may be rendered operative within a few seconds by replacing the belt 42 and by displacing the strips 55 away from one another by manually engaging the strip ends 57 so that the rod 51 may be re-applied to the slot 50 and the lever wall 49 positioned between the adjacent strip ends 56.

Various modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. An attachment for sewing machines equipped with a zigzag unit including a pointer swingably movable over a dial face for adjusting the mechanism of the sewing machine to cause the machine to produce a seam or row of stitching of a desired width, comprising a belt pulley adapted to be detachably connected to a rotatable part of the sewing machine for rotation in unison with the sewing machine balance wheel, a worm and worm wheel drive detachably and adjustably supported on a part of the sewing machine, a pulley connected to said drive, a belt connecting the first mentioned and last mentioned pulleys for causing the worm and worm wheel drive to be driven in unison with the balance wheel, a lever having an inturned projection at an upper end thereof adapted to engage in a recess of the pointer above the pivot thereof, a fastening connecting said lever to the pointer beneath the pointer pivot, and a connecting rod having one end eccentrically connected to the worm wheel of the worm and worm wheel drive and being connected near its opposite end to said lever below the pointer whereby rotation of said worm wheel will cause the connecting rod to reciprocate to impart an oscillating motion to the lever and pointer to produce a constantly varying adjustment of the zigzag mechanism while the sewing machine is in operation for producing a seam or row of stitching of a varying width and having undulating side edges.

2. An attachment for sewing machines as in claim 1, said lever having a flange near its lower end disposed at an angle to the plane of the lever and provided with an upwardly opening slot through which the connecting rod loosely extends, expansion springs disposed on said connecting rod between the adjacent ends of which said lever flange is disposed, and spring stops adjustably mounted on the connecting rod beyond the remote ends of said springs and engaging thereagainst for maintaining the springs under tension for cushioning the oscillating motion imparted to the lever by reciprocation of the connecting rod.

3. A sewing machine attachment as in claim 2, a pair of substantially rigid metal strips having end portions disposed at an angle to intermediate portions thereof, said strips including apertured adjacent end portions slidably engaging said rod and straddling the lever flange and against the remote sides of which the adjacent ends of said springs bear, and the other, remote apertured ends of said strips slidably engaging the connecting rod beyond said adjustable spring stops, said remote strip ends being manually displaceable away from one another to displace the adjacent strip ends out of engagement with the lever flange to facilitate disengagement of the connecting rod from the flange slot or engagement of the connecting rod therein.



4. An attachment for use with a sewing machine having a zigzag control unit including a pointer pivotally mounted intermediate of its ends for swinging movement of one end of the pointer over a dial face and which pointer is connected to mechanism of the sewing machine adjustable thereby for varying the width of a seam or row of stitching produced by the sewing machine, said attachment comprising a lever having an inturned projection extending from an upper end thereof and adapted to engage in a recess of the pointer disposed above the pointer pivot, a fastening detachably securing the lever to the pointer below the pointer pivot, a connecting rod connected to said lever below the fastening, a rotatably driven member to which said connecting rod is eccentrically connected adjacent one end of the connecting rod and remote to the portion thereof connected to the lever, and means forming a driving connection between said rotatable member and a rotary driven part of the sewing machine whereby said rotary driven member will be revolved by operation of the sewing machine for reciprocating the connecting rod to impart an oscillating movement to the lever and pointer to cause the mechanism controlled by the pointer to actuate mechanism of the sewing machine to produce a seam or row of stitching having uniform variations in the width thereof.

5. An attachment as in claim 4, and means carried by said connecting rod for cushioning the connection of the lever to the connecting rod including tensioned expansion coiled springs carried by the connecting rod and between the adjacent ends of which a portion of the lever is disposed, said last mentioned lever portion slidably engaging the connecting rod.

6. An attachment for use with a sewing machine having a zigzag control unit including a pointer pivotally mounted at a point spaced from an end thereof for swinging movement of one end of the pointer over a dial face and which pointer is connected to mechanism of the sewing machine adjustable thereby for varying the width of a seam or row of stitching produced by the sewing machine, said attachment comprising an attaching element secured to said pointer and extending longitudinally thereof, a connecting rod connected to said attaching element at a point spaced from the pointer pivot in a direction longitudinally of the pointer, a rotatably driven member, said connecting rod being eccentrically connected adjacent one end thereof to said rotatably driven member and remote from said attaching element, and means forming a driving connection between the rotatably driven member and a rotary driven part of the sewing machine whereby said rotatably driven member is revolved by operation of the sewing machine for reciprocating the connecting rod to impart an oscillating movement to the attaching element and pointer to cause mechanism controlled by the pointer to actuate mechanism of the sewing machine for producing a seam or row of stitching having uniform variations in the width thereof.

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