March 14, 1950 V. J. SIGODA 2,500,211

SEWING MACHINE

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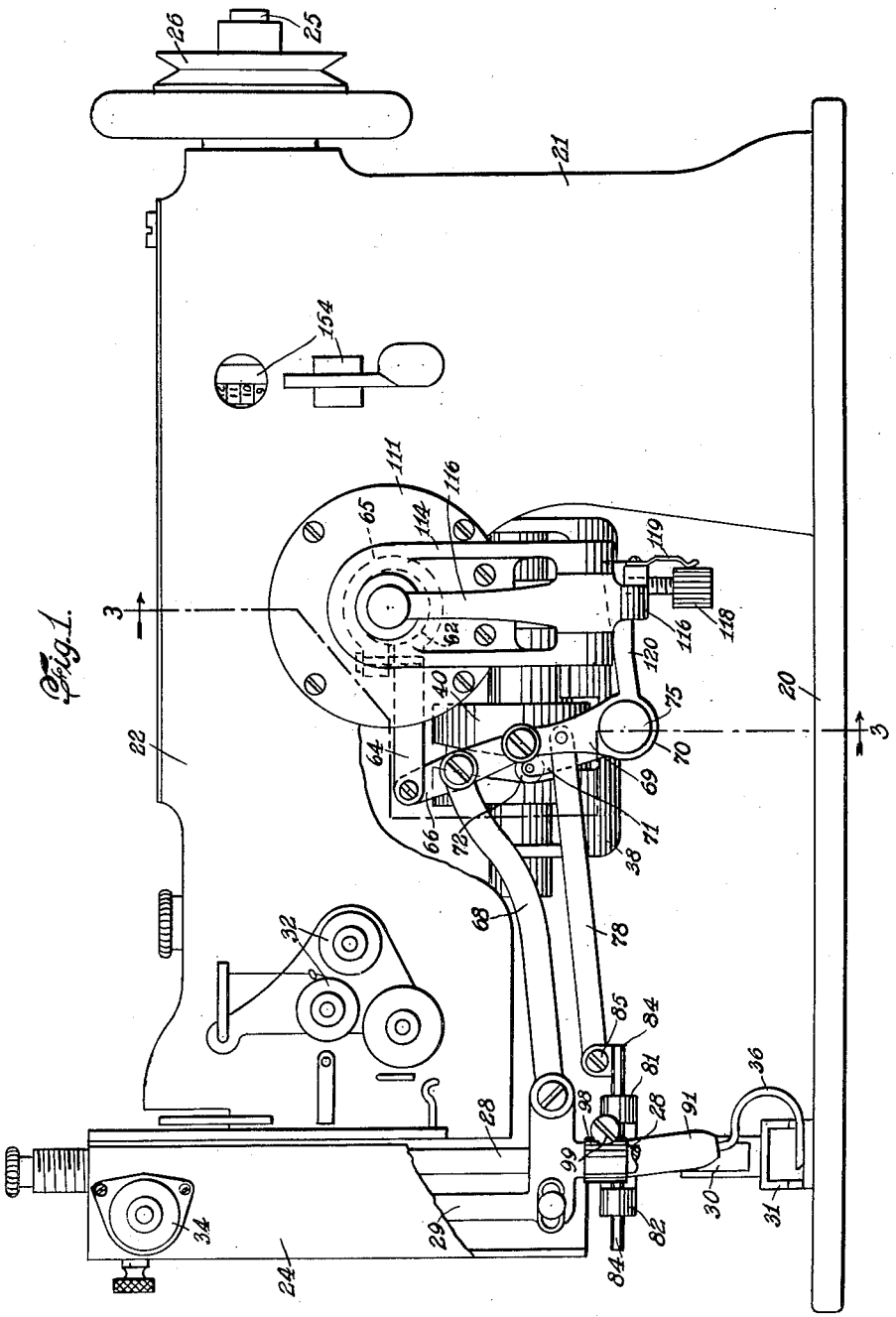



Fig. 1.

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SEWING MACHINE

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Fig. 3.

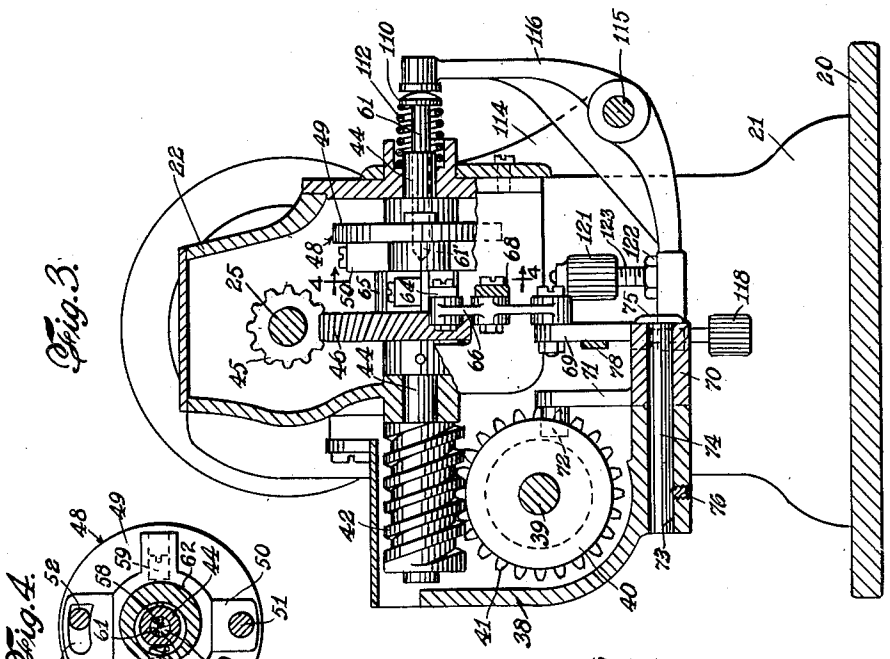
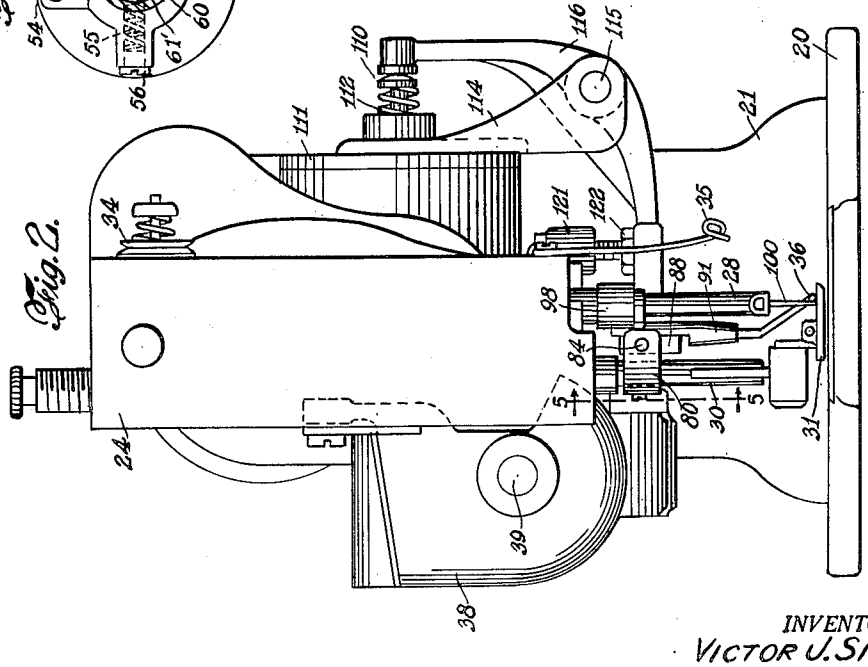


Fig. 4.



Fig. 2.



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SEWING MACHINE

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Fig. 5.

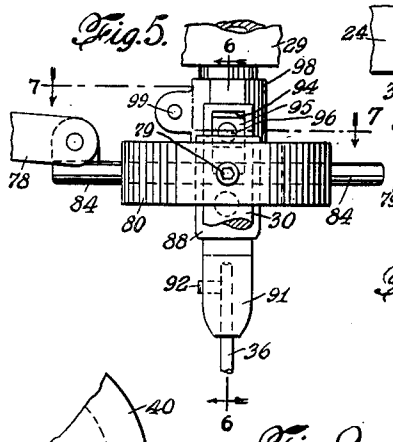



Fig. 6.

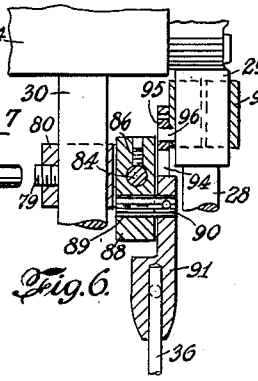



Fig. 7.

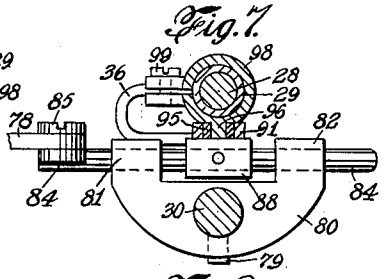



Fig. 8.

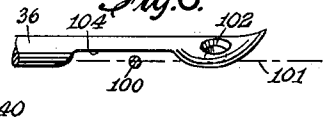



Fig. 9.

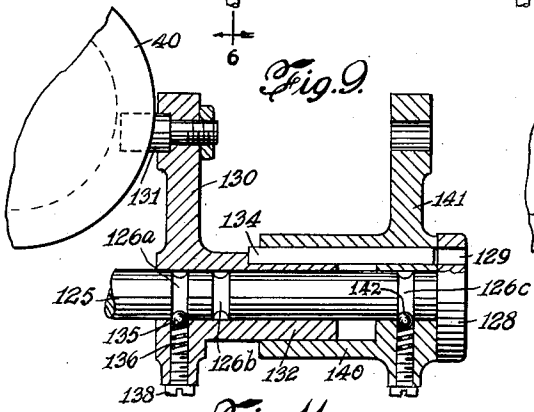



Fig. 10.

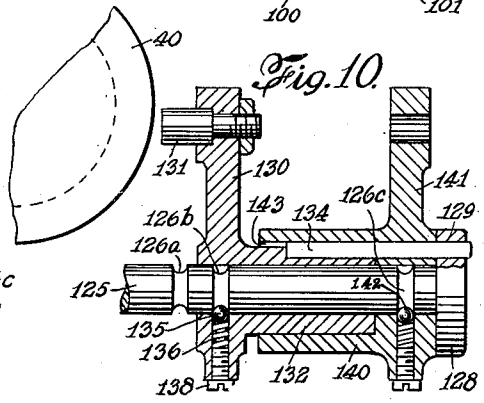



Fig. 11.

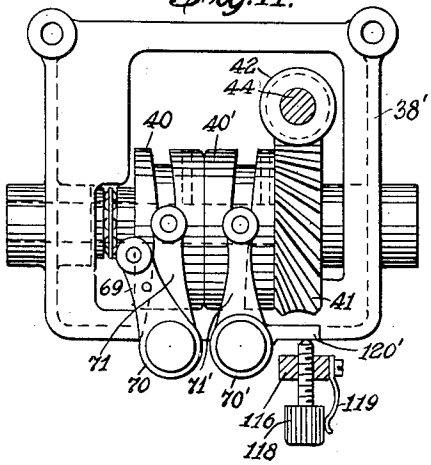



Fig. 14.

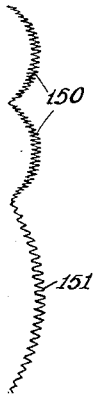



Fig. 15.

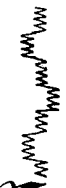


Fig. 16.

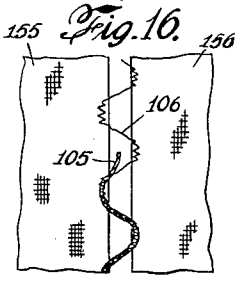



Fig. 12.

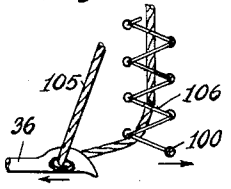
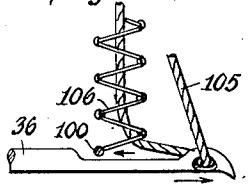



Fig. 13.




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Patented Mar. 14, 1950

2,500,211

# UNITED STATES PATENT OFFICE

2,500,211

## SEWING MACHINE

Victor J. Sigoda, Great Neck, N. Y., assignor to Man-Sew Corporation, New York, N. Y., a corporation of New York

Application June 7, 1947, Serial No. 753,175

18 Claims. (Cl. 112—98)

1

This invention relates to sewing machines, more particularly to that type of machine useful for producing ornamental stitching in the nature of embroidery and incorporating the essential features of the well-known vibrating needle or zigzag machine.

Sigoda Patent No. 2,365,222 of December 19, 1944, shows mechanism capable of application as an attachment to a standard zigzag machine (Singer sewing machine type 107W1) for producing embroidery stitching. The mechanism operates to laterally vibrate the needle to produce zigzag stitches and simultaneously to laterally shift the work area of the needle to produce patterns. It also feeds a filler thread to the line of stitching, the filler feeder being shifted so as to follow the median line of the zigzag stitching. The general objects of the present invention are to improve and augment that mechanism and increase its versatility with respect to the variety of work it is capable of producing.

More specific objects of the invention are:

(*a*) to provide means for automatically varying the bight of the zigzag stitching as the work progresses together with range limiting and lockout means therefor;

(*b*) to provide improved means for feeding a filler thread to and underneath the line of zigzag stitching so as to assure the engagement of the filler by each stitch;

(*c*) to provide means whereby the pattern-forming and filler feeding mechanism incorporated in a zigzag machine may be rendered inoperative at will so that the machine may be continued in operation, without removal of that mechanism, as a regular zigzag machine; and

(*d*) to provide mechanism capable of performing all of the foregoing objects simultaneously or selectively and of being attached to standard machines without alteration of their basic structure.

For the attainment of the above objects and others which will appear in the course of the ensuing description, the invention is illustrated by various specific embodiments illustrated in the drawings in which:

Fig. 1 is a front elevation of a sewing machine of the zigzag type incorporating one form of the novel filler-feeding mechanism and means for automatically controlling the bight of the needle;

Fig. 2 is an end view of the machine shown in Fig. 1 with certain minor parts omitted;

Fig. 3 is a section taken on the line 3—3 of Fig. 1;

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Fig. 4 is a detail, partly in section, of the adjustable eccentric forming part of the bight-controlling mechanism taken on the line 4—4 of Fig. 3;

Fig. 5 is a detail in rear elevation of part of the filler-feeding device taken on the line 5—5 of Fig. 2;

Fig. 6 is a side view of the same, partly in section, taken generally on the line 6—6 of Fig. 5;

Fig. 7 is a plan view of the same taken on the line 7—7 of Fig. 5;

Fig. 8 is an enlarged detail view of the end of the filler-feeding arm with its position relative to the needle shown by the broken line;

Fig. 9 is an enlarged detail view, principally in central vertical section, of a modified form of arm-carrying sleeve which enables the pattern-controlling and filler-feeding mechanism to be disconnected and rendered inoperative so that the machine operates as a regular zigzag machine;

Fig. 10 is a view of the parts shown in Fig. 9 shifted to inoperative and locked position;

Fig. 11 is an elevation of a modified form of the device in which separate cams drive the pattern forming mechanism and the bight control mechanism;

Figs. 12 and 13 are enlarged detail views illustrating the formation of a zigzag stitch over a filler;

Fig. 14 is a composite view showing two different patterns formed by the machine with two different adjustments of the work feed;

Fig. 15 shows another type of work capable of being produced; and

Fig. 16 shows a type of fagoting which may be performed by the machine.

The attachment of the aforesaid Patent 2,365,222 is illustrated in that patent as applied to a Singer type 107W1 machine and the attachments of the present invention are shown as applied to a generally similar machine known as the Singer 143W1.

Referring to Fig. 1, this machine has the usual base or cloth plate 20, pedestal 21, arm 22 and head 24. Extending horizontally within the arm, as shown in Fig. 3, is the usual main shaft 25 having a drive wheel 26 at one end and connected at the other end, within the head 24, with the usual mechanism for reciprocating the needle bar 28 which passes through a laterally shiftable guide frame 29 pivoted at its upper end in the usual manner within the head 24. The vertically movable presser foot bar 30 is also mounted in head 24 in the usual way and

carries the presser foot 31 at its lower end. The machine is provided as usual with one or more tension devices 32 for the needle thread and with an auxiliary tension device 34 for a filler thread, the latter passing downwardly through a guide 35 to the filler-feeding arm 36.

Fastened to the back of arm 22 in the manner described in Patent 2,365,222 is a housing 38 in which is mounted, parallel to main shaft 25, a cam shaft 39 to which is fixed a pattern cam 40 and a worm gear 41 adapted to be driven by a worm 42. The worm is mounted on the end of a transverse shaft 44 which is somewhat longer than and replaces the corresponding shaft with which the machine is originally equipped. Motion is imparted to this shaft from drive shaft 25 through a pair of spiral gears 45 and 46 (Fig. 3) which may have the usual ratio of 2 to 1 so that the transverse shaft 44 rotates once for each two revolutions of main shaft 25. The worm 42 and worm gear 41 may, for example, have a ratio of 24 to 1 so that the cam shaft 39 makes one revolution for each 48 revolutions of drive shaft 25. It will be understood that each revolution of shaft 25 forms one complete stitch. Cam 40 will therefore revolve once during each 48 stitches with the above ratios.

Also mounted on the transverse shaft 44 is an adjustable eccentric of known construction, generally indicated at 48, the principal working parts of which are shown in detail in Fig. 4. They comprise a disc 49 rotatable with shaft 44 on which is mounted a frame 50 pivoted at 51 to said disc, the movement of the frame being limited by the cooperation of a stud 52 with an arcuate slot 54. Frame 50 is provided on either side with a hollow arm in one of which is a compression spring 55 held in place by a screw 56 and in the other of which is a thrust pin 58 having a head 59 threaded in the frame. The thrust pin passes through an opening in the side of shaft 44 into the bore 60 with which this shaft is provided and in which is a plunger 61 having a conical end 61'. As is well understood, the degree of offset of eccentric 62, which is integral with frame 50, with respect to shaft 44, may be varied by longitudinal movement of plunger 61, the end 61' of which acts against the end of pin 58 to move frame 50. When plunger 61 is moved inwardly it moves frame 50 and eccentric 62 against the compression of spring 55, increasing the degree of offset; and conversely, when the plunger is retracted the spring 55 moves the eccentric to reduce the amount of its offset.

Lateral vibratory movement for the formation of zigzag stitches is produced by the rotation of eccentric 62, when it is offset from the center of shaft 44, through the connecting rod 64, which has a strap 65 surrounding the eccentric, rod 64 being attached to the upper end of a link 66 to which is connected a pitman 68 which is attached to the needle bar guide frame 29.

The lower end of link 66 is fulcrumed on the end of an arm 69 which is carried by a sleeve 70, said sleeve having another arm 71 (Fig. 3) which is provided at its end with a roller 72 which engages with cam 40. Sleeve 70 is rotatably mounted on a rod 74 which is supported in a bore 73 in the lower part of housing 38. Rod 74 has a head 75 and is held stationary by a set screw 76. As cam 40 rotates it acts through arm 71 and sleeve 70 to shift arm 69 in accordance with the pattern on the cam, thus shifting the fulcrum point of the linkage which produces the vibratory motion of guide 29 to produce a lateral shifting of the working area of the needle which is independent of its lateral vibration. Also attached at one end to arm 69 is a bar 78 which is attached at its other end to the filler-feeding mechanism, hereinafter described, so that a lateral shifting of said mechanism is produced which corresponds to the lateral shifting of frame 29.

As thus far described, the mechanism is, in general, similar to that disclosed in Patent 2,365,222.



*Filler feeding mechanism*

The apparatus about to be described has for its function the feeding of any desired filler to the line of zigzag stitching, which filler may consist of thread, cord, gimp or the like.

This mechanism actuates the filler-feeding arm 36. Its relation to the machine is shown in Figs. 1 and 2 and its detailed structure in Figs. 5, 6, 7 and 8. Clamped on the presser foot bar 30 by means of a set screw 79 is a yoke 80 having a pair of forwardly extending arms 81 and 82 perforated horizontally to receive a sliding shaft 84 which is attached at one end to the bar 78 by a screw 85. Fixed on slide shaft 84 by a set screw 86 is a block 88 which has a bore 89 to receive the pivot pin 90 which is carried by the swingable arm 91. The latter arm has a socket in its lower end to receive the filler-feeding arm 36, which is held in place by a set screw 92, and above its pivot pin 90 it has a rectangular aperture 94 in which slides a small block 95 which is perforated to receive a pin 96 carried on a collar 98 clamped on the lower end of frame 29 by means of a screw 99.

The operation of this feeder is as follows: As arm 69 is laterally shifted by the rotation of cam 40 it simultaneously shifts frame 29 through pitman 68 and slide shaft 84 through arm 78, thus simultaneously moving pivot pin 90 which supports arm 91 and the pin 96 which is carried by the collar 98 attached to frame 29. So long as these two pins 90 and 96 are kept in the same relative position, arm 91 will not swing but will merely move from side to side following the working position of the needle. However, the lateral vibratory movement of frame 29 which is produced by the eccentric 62 will cause a relative shifting of the pins 90 and 96, which causes arm 91 to swing about pivot 90. Viewed from the rear, as in Fig. 5, when frame 29 is shifted to the left, thus carrying the needle in the same direction, the lower end of feeder arm 91 will swing to the right, and, when the next stitch is formed, frame 29 will swing to the right and arm 91 will swing to the left. Obviously the filler may be made to swing in the same direction as the lateral movement of the needle by modifying the structure shown so that the connection between the frame 29 and arm 91 is below pivot 90 instead of above it as shown. The extent of the swing of the filler feeder will be proportionate to the swing or bight of the needle and the ratio of the distances through which these two elements swing will depend upon the vertical spacing between the pins 90 and 96. This is subject to adjustment by vertical movement of the collar 98 or of the yoke 80. Movement of the latter will also affect the position of the arm 36 with respect to the work positioned on the base 20 of the machine, but it is subject to further compensatory adjustment through movement of the arm 36 within the arm 91. The

slidable mounting of block 95 in aperture 94 permits such adjustment and it also permits the raising of presser foot bar 30 to release the work.

It is desirable that the filler-feeding arm 36 work very close to and directly in front of the needle, approximately as shown in Fig. 2, where the needle is designated 100. In Fig. 8, the end of the filler-feeding arm is shown in enlarged detail and its path of travel relative to needle 100 is shown by the broken line 101. In the end of arm 36 is an aperture 102 through which the filler passes, this aperture sloping downwardly toward the needle. The end of arm 36 containing the aperture 102 is formed with a curved surface as shown, and at one side of the aperture the thickness of the arm is reduced at 104 for reasons which will be evident from inspection of Figs. 12 and 13, which illustrate how the filler 105 is drawn to one side against each stitch after it is formed so that it will be crossed by the needle thread 106 as the needle descends to make the next stitch. This action positively assures the crossing of the filler by each stitch because just prior to the formation of every stitch the filler is pulled up against the thread which extends from the last preceding stitch to the needle and when the needle descends it is bound to lay the thread across the filler. In prior machines, in which the filler is merely guided in front of the needle, without being shifted laterally, the stitches are frequently formed to one side of the filler so that the filler is outside the line of stitching. While line 101 passes through the head of feeder 36, it will be understood that the needle is raised out of the way as the feeder moves from one side of the needle path to the other.

*Bight control*

It has been explained above how the zigzag stitch is formed by lateral vibration of the needle bar guide frame 29 from the eccentric 62 which transmits motion to the frame through connecting rod 64, link 66 and pitman 68. The extent of this lateral vibration is determined by the longitudinal position of the pointed plunger 61 with respect to the thrust pin 58 of the variable eccentric shown in Fig. 4. To automatically vary the bight of the stitching as the work progresses, the machine is provided with actuating mechanism for plunger 61 which is controlled by a cam on the shaft 39 which may be the same cam which operates to laterally shift guide frame 29 to produce a pattern, as is the case in the structure shown in Figs. 1 and 3, or it may be a separate cam as shown in Fig. 11.

Referring to Figs. 1, 2 and 3, plunger 61, which is freely slidable in the bore of shaft 44, is provided with a head 110 between which and the removable plate 111 is a compression spring 112 so that the plunger is normally retracted. Pivotally mounted on a bracket 114 by a pin 115 is an arm in the shape of a bell crank 116 one end of which is adapted to press against the head 110 of plunger 61. The other end of arm 116 is provided with an adjustable screw 118, held in position by a detent 119, the upper end of the screw bearing against an arm 120 which is formed on or attached to the side of the sleeve 70. It will thus be seen that as sleeve 70 is rocked by cam 40, the arm 120 will actuate crank 116, pressing inwardly on plunger 61 when sleeve 70 is rotated in a clockwise direction as seen in Fig. 1, thus varying the bight in accordance with the pattern of cam 40. On the upper side of the lower end of crank 116 a second adjustable screw 121 is provided by means of which the outward movement of plunger 61 may be limited. Screw 121 is adapted to be turned up into engagement with the under side of the arm 22 of the machine. Screw 121 may be turned up sufficiently so as to produce the maximum bight for which the machine is designed, in which case the bight will be unaffected by movements of the arm 120, or it may be set to maintain a desired minimum bight. Screw 121 is internally threaded throughout most of its length and is rotatable on threaded shaft 123 which is screwed into arm 116 and held there by lock nut 122. A detent like detent 119 (Fig. 1) may be used to hold screw 121 in any given position if desired.

Referring to Fig. 11, a modified form of bight control is shown mounted in a housing 38' in which a second cam 40' is placed on shaft 39 between cam 40 and gear 41 so as to actuate the sleeve 70' having a side arm 120' pressing against screw 118 to effect bight control independently of the cam 40 and arm 69. Cam 40' transmits motion to sleeve 70' through an arm 71'. With this arrangement, in which the bight control is independent of the pattern control, any desired combination of effects may be produced by proper shaping and positioning of the separate cams.

*Pattern control disconnecting mechanism*

Referring to Figs. 9 and 10, a modified structure is shown which may be substituted for the sleeve 70 and the arms 69 and 71 carried thereby, as best shown in Fig. 3, by means of which the mechanism for producing lateral shifting of guide frame 29 and the filler-feeding mechanism may be rendered inoperative and held in fixed position so that the machine may be operated at will as an ordinary zigzag machine.

There is substituted for rod 74 a rod 125 having peripheral grooves 126*a*, 126*b* and 126*c* and a head 128 having an aperture 129. Mounted on this rod is a cam-following arm 130 having a roller 131, which arm is carried on a sleeve 132 to which is fixed a key 134. Sleeve 132 is provided with a threaded socket in which is a ball 135, pressed upwardly by a spring 136 held in place by a screw 138, and adapted to engage grooves 126*a* or 126*b*. Concentric with sleeve 132 is a second sleeve 140 carrying an arm 141 which corresponds to the arm 69 of Figs. 1 and 3. Sleeve 140 is slotted at 143 to receive key 134 and is provided with a detent 142 like 135 coacting with groove 126*c*. Since sleeve 132 is slidable longitudinally within sleeve 140, arm 130 may be moved along rod 125 toward its head 128 whenever key 134 is in alignment with aperture 129, which is of a size to fit the key closely. When thus moved the key will enter the aperture as shown in Fig. 10, roller 131 will be disengaged from cam 40 and arm 130 will be maintained in this position by the engagement of ball 135 with the groove 126*b*. The arm 141 will be fixed in position by the engagement of key 134 with aperture 129 and this will hold stationary the fulcrum for link 66, through which the lateral vibration is transmitted to frame 29. During operation of the machine under these conditions, frame 29 will be moved only by eccentric 62. The needle may be laterally vibrated to produce zigzag stitches but they will be applied to the work in a straight line unaffected by the pattern control mechanism. The filler feeder, however, will continue to operate as usual so long as there is any relative lateral

movement between the needle bar guide frame 29 and the presser foot bar 30.

Disconnectable cam following mechanism as just described may be used also in connection with cam 40' in Fig. 11, if desired, in place of sleeve 70' and arm 71'.

The structure of Figs. 9 and 10 requires stopping of the machine with key 134 in alignment with aperture 129 to permit withdrawal of the roller 131 from cam 40. However, by proportioning the parts so that roller 131 is free of the cam before key 134 enters aperture 129 the mechanism can be disconnected and locked with the machine running.

*Examples of work*

Fig. 14 illustrates a type of scallop embroidery which may be produced by the simultaneous use of the pattern-forming and the bight control mechanisms. Referring to the scallops 150, it will be observed that the scallop is produced by the lateral shifting of the working position of the needle as the work progresses, each scallop being formed during one complete revolution of the pattern cam 40. Of course, one cam may be designed to produce a plurality of scallops. Simultaneously the bight is varied by the same cam, acting through arm 120 and crank 116, to vary the eccentric 62 so that the bight is substantially zero at the beginning of each scallop and gradually increases in width toward its center, at which point it begins to diminish again, giving the scallop a true crescent shape. The longer scallop 151 illustrates the change in form resulting from a change of the rate of feed alone, the rate of feed being twice that used to form the scallops 150. This change is made in the usual manner by means of the feed dog adjustment 154 (Fig. 1) which is standard equipment on this type of machine. Scallops, as shown, may be formed either with or without a filler.

Fig. 15 shows another type of stitching produced without bight variation and by means of a pattern cam so formed as to rapidly shift the guide frame 29 at intervals from a central position to the left, back to the center, to the right, back to the center again and so on.

Fig. 16 shows a type of fagoting which may be produced, either with or without a filler, so as to join together the spaced edges of two pieces of fabric 155 and 156. The pattern cam 40 is so formed as to shift the frame 29 from side to side at a substantially constant rate. If a filler is not used, the needle thread 106, in passing across the space between the two edges of the fabric, will merely form a twist with the bobbin thread. If a filler 105 is used, as shown in the lower part of Fig. 16, the needle and bobbin threads will be twisted about the filler in the space between the pieces of fabric. Where the stitching overlies the fabric the needle thread of course forms stitches therein and, if a filler is used, the filler is secured to the fabric by the stitches.

The machine herein described is capable of producing a great variety of other stitches in addition to those specifically shown by way of example, the form and appearance of which can be varied by using different pattern cams, different bight control cams, by different relative settings of the cams when separate cams are used, by various combinations of thread and filler and by different rates of feed.

It will be understood that the details of construction described in connection with the foregoing specific embodiments of the invention are to be construed as merely illustrative and not as limitations of the invention as hereinafter defined in the claims.

What is claimed is:

1. In a sewing machine having a reciprocating needle bar, a guide frame therefor and mechanism to concurrently produce lateral shifting and lateral vibration of said frame, said mechanism including a variable eccentric having regulating means to control the amplitude of said vibration and a continuously rotating pattern cam to produce said shifting; the combination with said mechanism of an oscillatable member actuated by said cam, said member having operative connections with said guide frame to shift it laterally and with said regulating means to vary the adjustment of said eccentric, whereby the rotation of said cam simultaneously shifts said frame laterally and varies the amplitude of its vibration.

2. In a sewing machine having a reciprocating needle bar, a guide frame therefor and mechanism to concurrently produce lateral shifting and lateral vibration of said frame, said mechanism including a variable eccentric having an axially slidable regulating spindle to control the amplitude of said vibration and a continuously rotating pattern cam to produce said shifting; the combination with said mechanism of an oscillatable member actuated by said cam, said member having a pair of arms, one of said arms serving to shift said frame, a lever pivoted intermediate its ends, one end of said lever acting upon said spindle to move it axially and the other end of said lever having an operative connection with the other of said arms on said member, whereby the rotation of said cam simultaneously shifts said frame laterally and varies the amplitude of its vibration.

3. In a sewing machine having a vertically reciprocable needle bar and a guide frame therefor adapted to impart lateral vibratory movement to said bar, filler feeding mechanism comprising a feeder arm, a pivotal support for said arm adjacent said frame, and a pivotal connection between said frame and said arm spaced from said pivotal support whereby the lateral movement of said frame swings said arm about its support.

4. The mechanism of claim 3 wherein said pivotal connection between said frame and said arm is slidable in a direction substantially at right angles to the movement of said frame, whereby said feeder arm and its support are movable vertically relative to said frame.

5. In a sewing machine, the combination with stitch forming mechanism including a needle bar and needle carried thereby a guide frame for said bar, and mechanism for imparting lateral vibratory motion and concurrent lateral shifting to said frame to form a design, of means for feeding a filler to the stitching and for guiding it under each stitch, including a filler feeding arm, means for pivotally mounting said arm for swinging motion in advance of the needle and across the feed path of the material, means for shifting the pivotal point of said arm in accordance with said lateral shifting of said frame, said frame and said arm being inter-connected at a point spaced from said pivotal point whereby said lateral vibratory movement of said frame is translated into lateral swinging motion of said arm.

6. In a sewing machine having a presser foot bar, a reciprocable needle bar parallel thereto, a guide frame for the needle bar, and means for laterally vibrating said frame; filler feeding mech-

anism comprising a feeding arm, a pivotal support for said arm mounted on said presser foot bar and having its axis at right angles to the axis of the presser foot bar, and a direct driving connection between said frame and said arm spaced from the center of rotation of said arm on its support, whereby lateral movement of said frame causes said arm to swing on its pivot.

7. Filler feeding mechanism for a sewing machine which has parallel presser foot and needle bars, and a guide frame for the needle bar adapted to be laterally shifted to form a pattern and laterally vibrated to form zigzag stitches, comprising: a yoke attached to said presser foot bar having arms extending toward said needle bar, a shaft slidably mounted in said arms, means for sliding said shaft in accordance with the lateral shifting of said frame, a block fixed on said shaft, an arm pivotally mounted on said block and having an aperture spaced from its pivot point, and a member carried by said frame extending into said aperture to transmit motion of the frame to said arm, whereby said arm is rotated on its pivot as said frame is laterally vibrated.

8. In a sewing machine, in combination, a main shaft, a needle bar reciprocated by the rotation thereof, a guide frame for said bar, a transverse shaft driven from the main shaft, a cam shaft driven from the transverse shaft, vibrating means for said frame including a variable eccentric on the transverse shaft having a regulating spindle extending outwardly therefrom, a cam carried by the cam shaft, a member oscillated by said cam, a bell crank having one end positioned to actuate said spindle and the other end to be actuated by said member, and means connecting said member with said frame whereby movement of said member simultaneously shifts said frame and varies said eccentric.

9. In a sewing machine, in combination, a main shaft, a needle bar reciprocated by the rotation thereof, a guide frame for said bar, a transverse shaft driven from the main shaft, a cam shaft driven from the transverse shaft, vibrating means for said frame including a variable eccentric on the transverse shaft having a regulating spindle extending outwardly therefrom, a pattern cam and a vibration-controlling cam carried by the cam shaft, members separately oscillated by each of said cams, a bell crank having one end positioned to actuate said spindle and the other end to be actuated by the said member oscillated by the vibration-controlling cam, and means connecting the member oscillated by said pattern cam with said frame whereby rotation of said cams simultaneously shifts said frame and varies said eccentric.

10. In a sewing machine, in combination, a main shaft, a needle bar reciprocated by the rotation thereof, a guide frame for said bar, a transverse shaft driven from the main shaft, a cam shaft driven from the transverse shaft, vibrating means for said frame including a variable eccentric on the transverse shaft having a regulating spindle extending outwardly therefrom, a cam carried by the cam shaft, a member oscillated by said cam, a bell crank having one end positioned to actuate said spindle and the other end to be actuated by said member, and means associated with said crank to limit the extent of its movement by said member.

11. The combination of claim 10 wherein the said means to limit the movement of said bell crank comprises an adjustable stop adapted to hold said crank out of driven engagement with said member during at least a part of the movement of said member.

12. In a sewing machine having a reciprocating needle bar, a guide frame therefor, and mechanism to concurrently produce lateral shifting and lateral vibration of said frame, said mechanism including a rotating pattern cam to produce said shifting; means for rendering operative or inoperative at will said mechanism for producing lateral shifting without affecting said mechanism for producing lateral vibration comprising: a fixed rod mounted adjacent said cam, a first arm adapted to be driven by said cam slidably and rotatably mounted on said rod, a second arm rotatably mounted on said rod and having a driven connection with said first arm, said second arm serving as a fulcrum for a part of said mechanism for producing lateral vibration, and locking means operative upon sliding of said first arm out of engagement with said cam to hold said second arm in a fixed position on said rod.

13. In a sewing machine having mechanism including a rotating cam to produce variations in the stitching; means for rendering operative or inoperative at will said mechanism comprising: a fixed rod having a head and mounted adjacent said cam, a first arm adapted to be driven by said cam slidably and rotatably mounted on said rod, a second arm rotatably mounted on said rod, a key carried by said first arm and extending through a way in said second arm, said head having an aperture to receive said key upon sliding of said first arm out of engagement with said cam to hold said second arm in a fixed position on said shaft.

14. In a sewing machine having mechanism including a rotating cam to produce variations in the stitching; means for rendering operative or inoperative at will said mechanism comprising: a fixed rod mounted adjacent said cam, a first arm adapted to be driven by said cam slidably and rotatably mounted on said rod, a second arm rotatably mounted on said rod and having a driven connection with said first arm for rotation therewith, and locking means rendered operative upon sliding of said first arm out of engagement with said cam to hold said second arm in a fixed position on said rod.

15. In a sewing machine having a reciprocable needle bar and a needle carried thereby adapted to form stitches, means for feeding a filler underneath said stitches comprising a filler feeding arm, a support for said arm, a guide member for said bar, means for laterally vibrating said member relative to said support to laterally vibrate said bar, said arm having spaced points of direct connection with said support and said guide member respectively, whereby the differential motion between said support and said member produces motion of said arm to laterally shift said filler in accordance with the lateral vibrations of said bar.

16. In a sewing machine having a reciprocable needle bar, a thread-carrying needle mounted thereon, a guide frame for said bar, and means for laterally vibrating said frame; filler feeding mechanism for guiding a filler across the path of each stitch prior to its formation comprising, a filler feeding arm, means for supporting said arm for swinging motion in a plane parallel to the axis of said needle, said arm and said frame being interconnected at a point spaced from the support for said arm, whereby after the formation of a stitch said arm is shifted by movement of

said frame relative to said supporting means to draw the filler up against the thread extending from said stitch to the needle prior to the formation of the next succeeding stitch.

17. In a sewing machine having mechanism including a rotating cam to produce variations in the stitching; means for rendering operative or inoperative at will said mechanism comprising: a fixed rod mounted adjacent said cam, an arm adapted to be driven by said cam slidably and rotatably mounted on said rod, means for retaining said arm in two positions longitudinally of said rod, one position being a cam-engaging position and the other being a cam-disengaging position, and means adapted to secure said arm against rotation on said rod when in the latter position.

18. In a sewing machine, the combination with stitch forming mechanism including a needle bar and a needle carried thereby, a guide frame for said bar, and mechanism for imparting lateral vibratory motion and concurrent shifting to said frame to form a design, of means for feeding a



filler to the stitching and for guiding it under each stitch, mechanism for imparting lateral vibratory motion to and concurrent lateral shifting of said filler feeding means comprising a member attached to the machine in the general vicinity of the needle bar, a member supported thereby for slidable movement in a straight line, means for operating said slidable member from said design forming mechanism, and a feeder arm supporting said filler feeding means operably connected with the slidable member.

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