July 9, 1940. S. ZONIS 2,207,141

ZIGZAG MACHINE WITH TWO NEEDLES AND TWO HOOKS

Filed Dec. 7, 1937 8 Sheets-Sheet 1

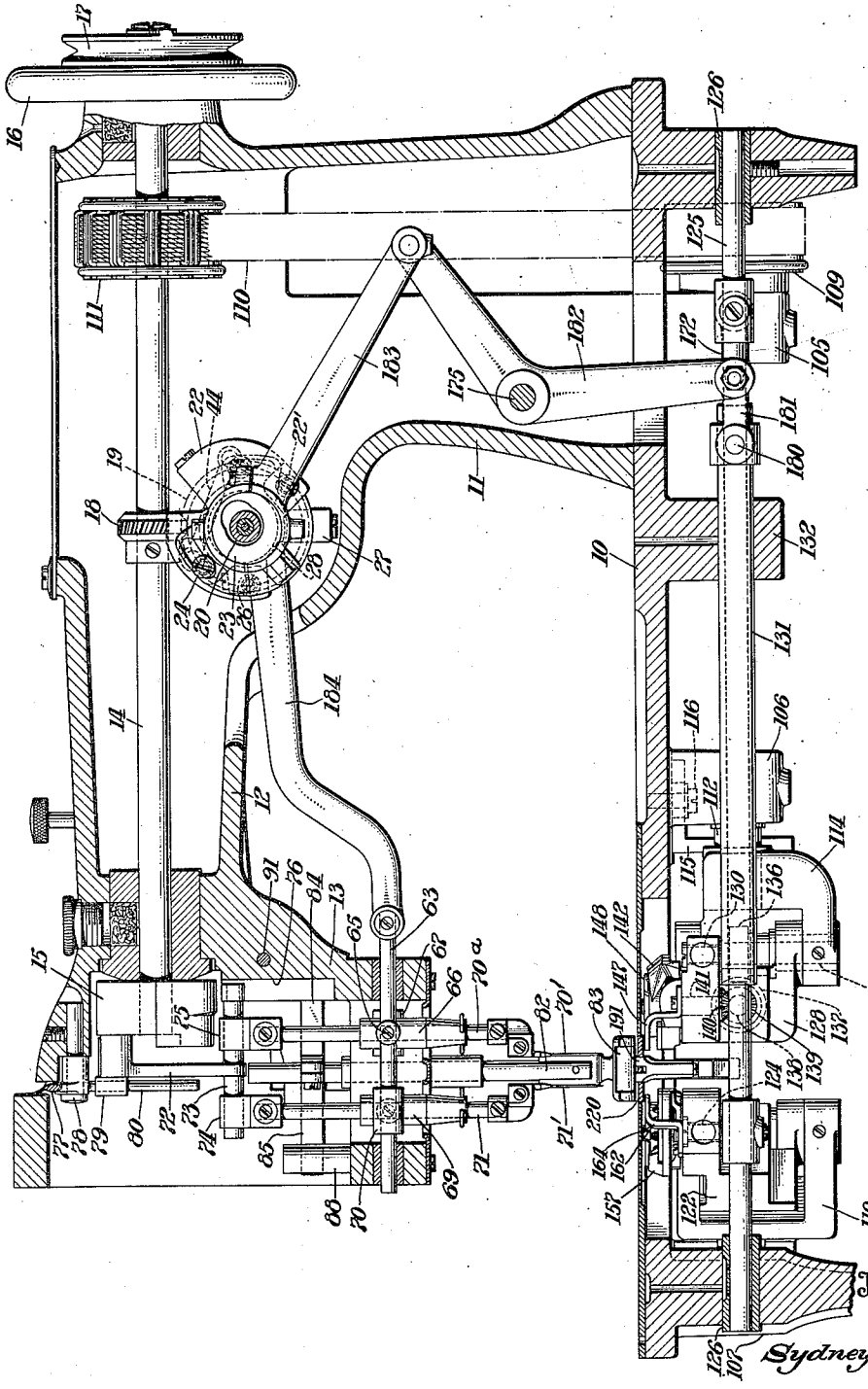

Fig. 1.

Witness:
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July 9, 1940. S. ZONIS 2,207,141

ZIGZAG MACHINE WITH TWO NEEDLES AND TWO HOOKS

Filed Dec. 7, 1937 8 Sheets-Sheet 2

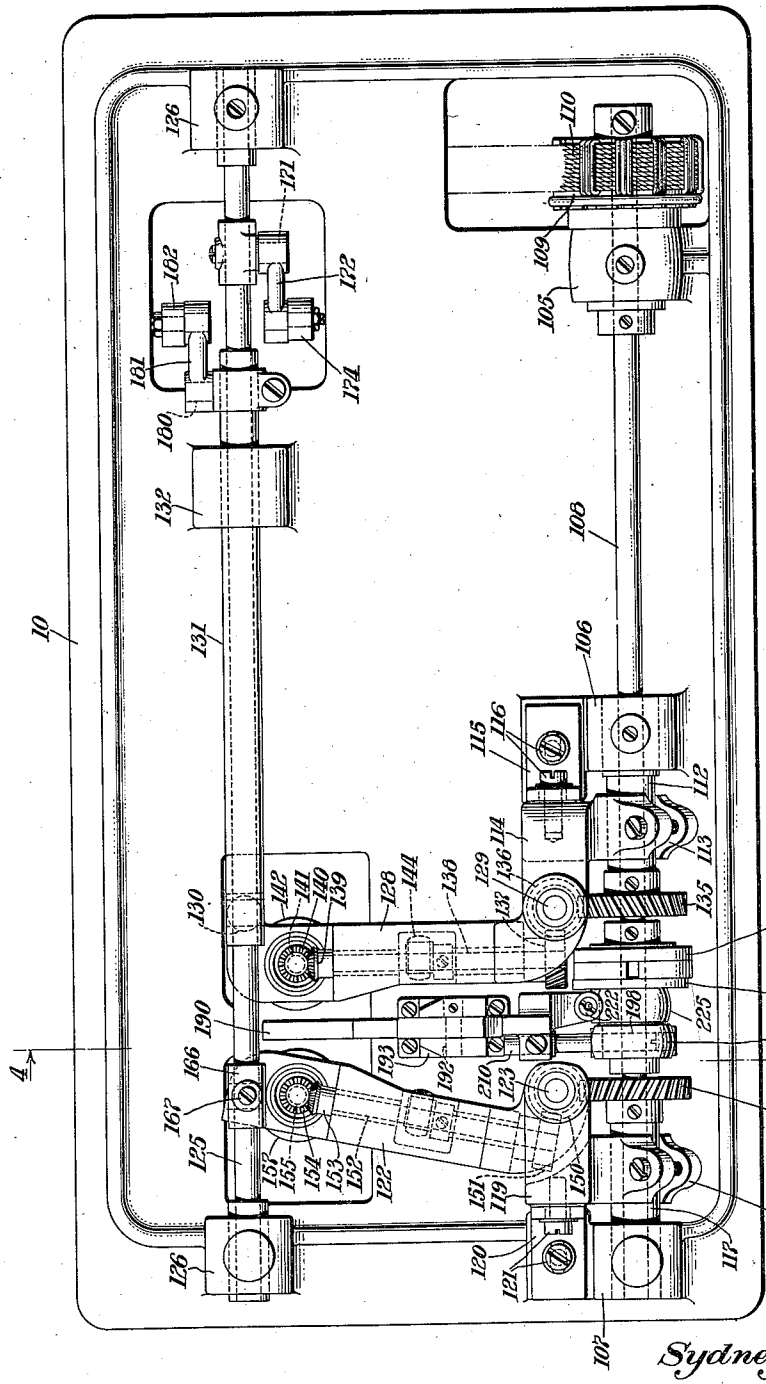

Fig. 2.

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ZIGZAG MACHINE WITH TWO NEEDLES AND TWO HOOKS

Filed Dec. 7, 1937 8 Sheets-Sheet 3

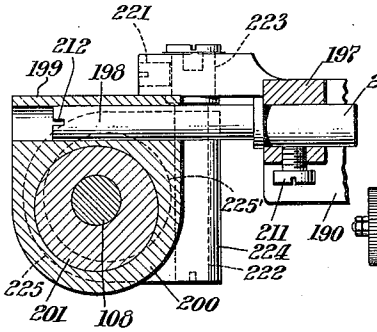

Fig 16.

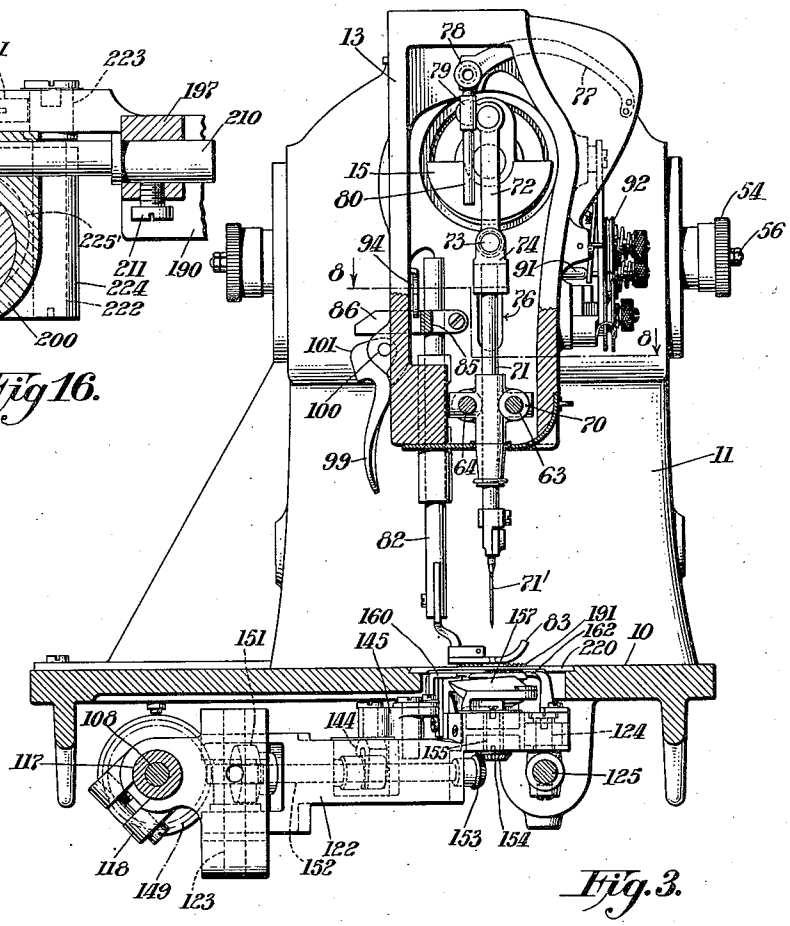

Fig. 3.

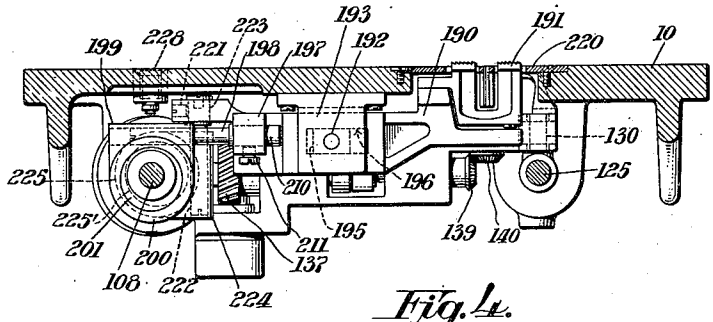

Fig. 4.

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July 9, 1940. S. ZONIS 2,207,141

ZIGZAG MACHINE WITH TWO NEEDLES AND TWO HOOKS

Filed Dec. 7, 1937 8 Sheets-Sheet 4

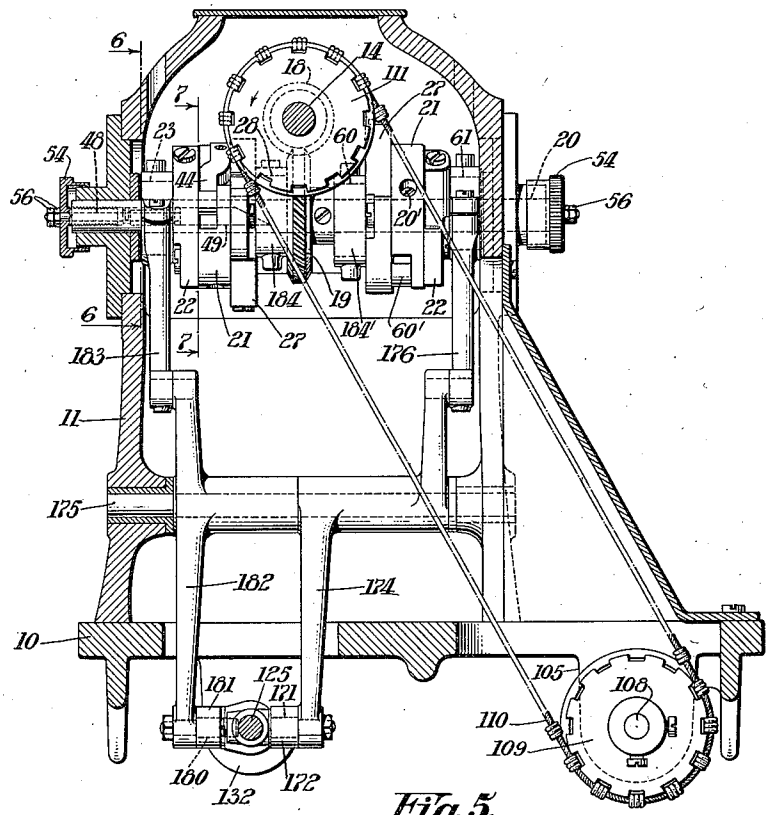

Fig. 5.

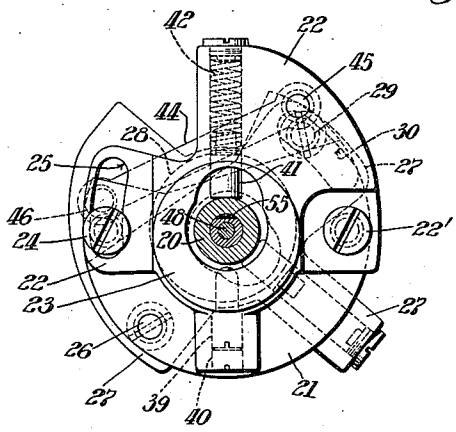

Fig. 6.

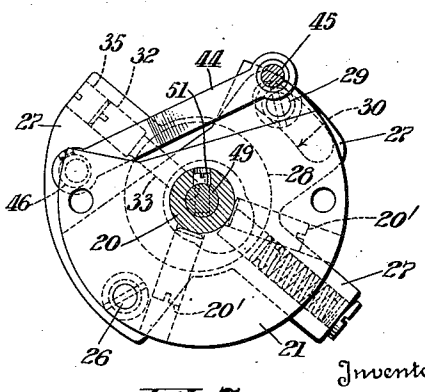

Fig. 7.

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July 9, 1940. S. ZONIS 2,207,141

ZIGZAG MACHINE WITH TWO NEEDLES AND TWO HOOKS

Filed Dec. 7, 1937 8 Sheets-Sheet 5

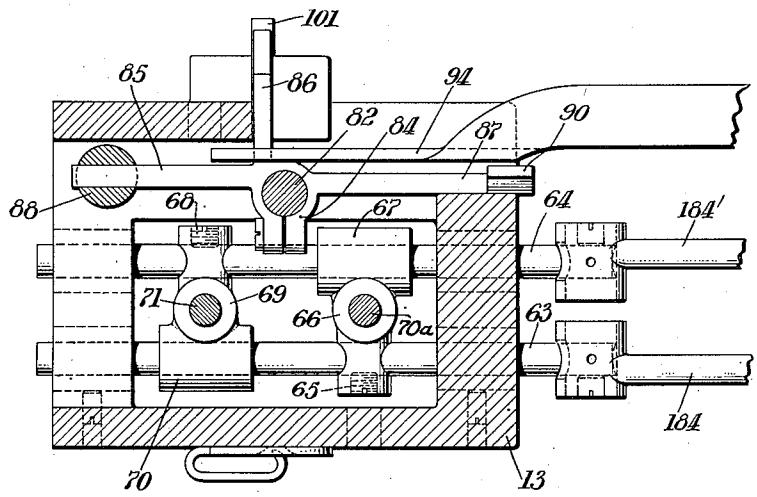

Fig. 8.

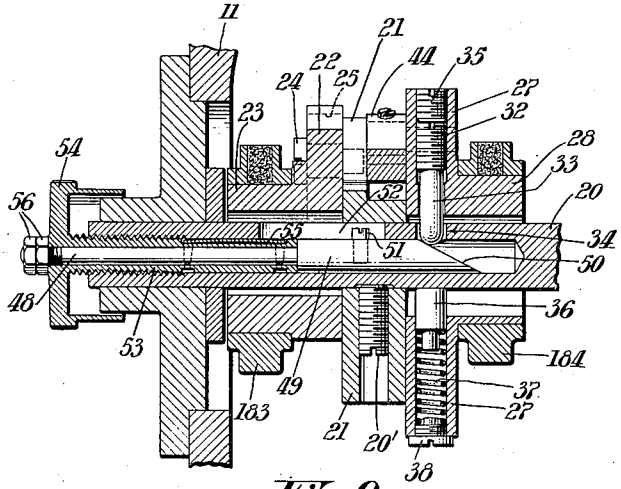

Fig. 9.

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July 9, 1940. S. ZONIS 2,207,141

ZIGZAG MACHINE WITH TWO NEEDLES AND TWO HOOKS

Filed Dec. 7, 1937 8 Sheets-Sheet 6

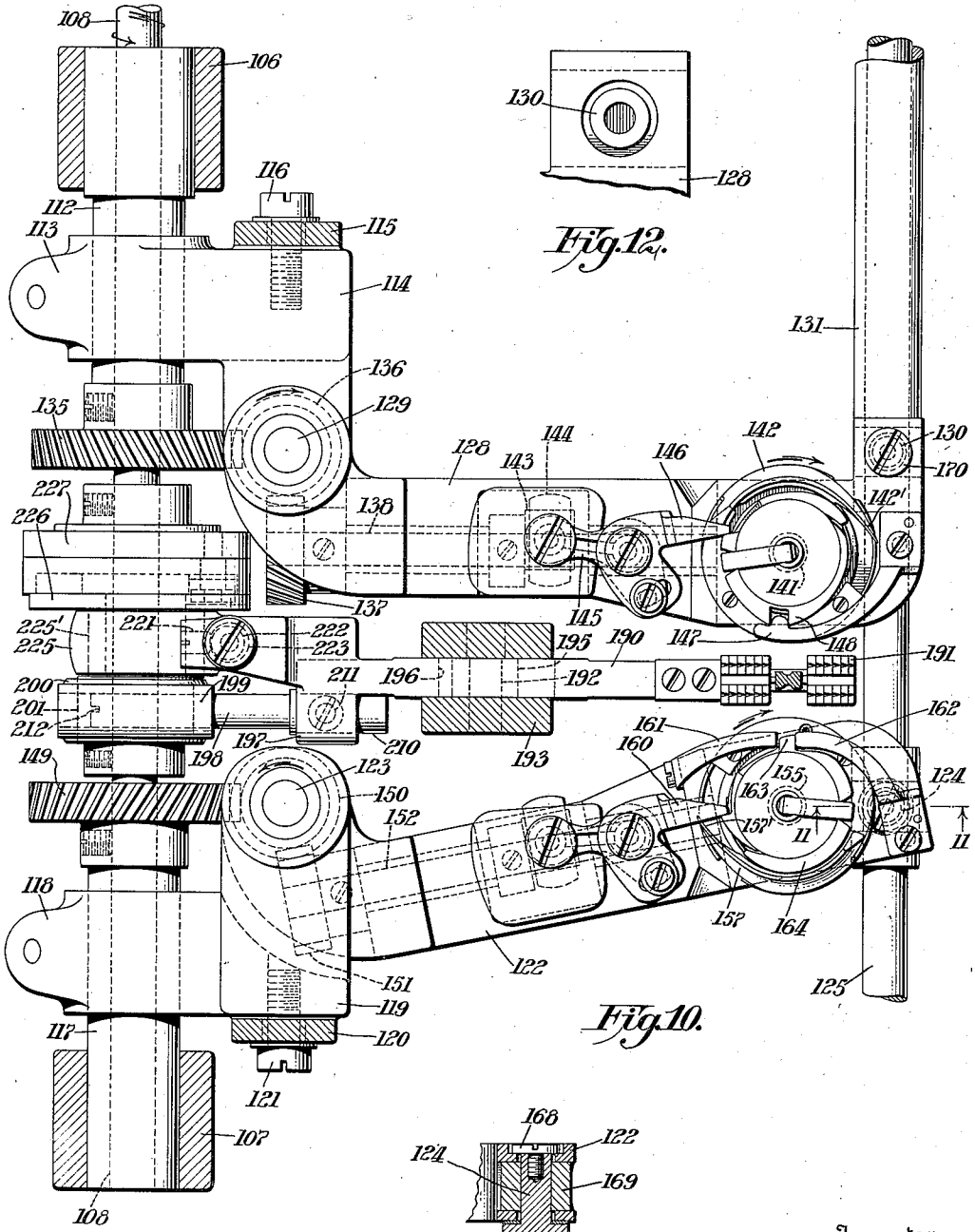

Fig. 12.

Fig. 10.

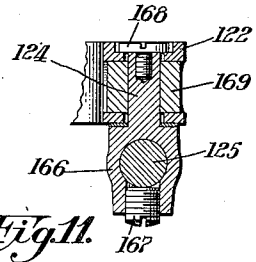

Fig. 11.

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July 9, 1940. S. ZONIS 2,207,141

ZIGZAG MACHINE WITH TWO NEEDLES AND TWO HOOKS

Filed Dec. 7, 1937 8 Sheets-Sheet 7

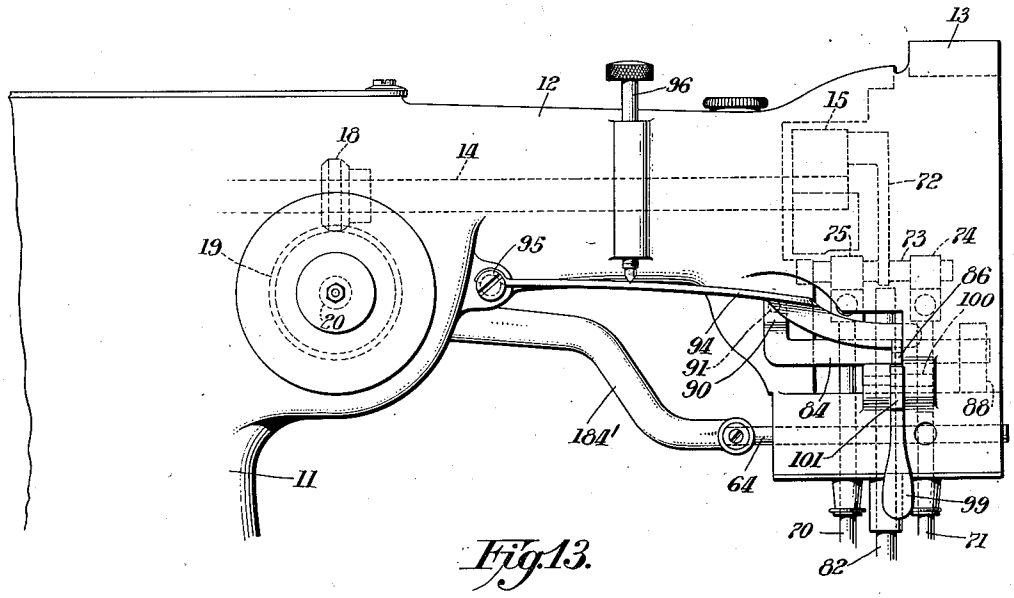

Fig. 13.

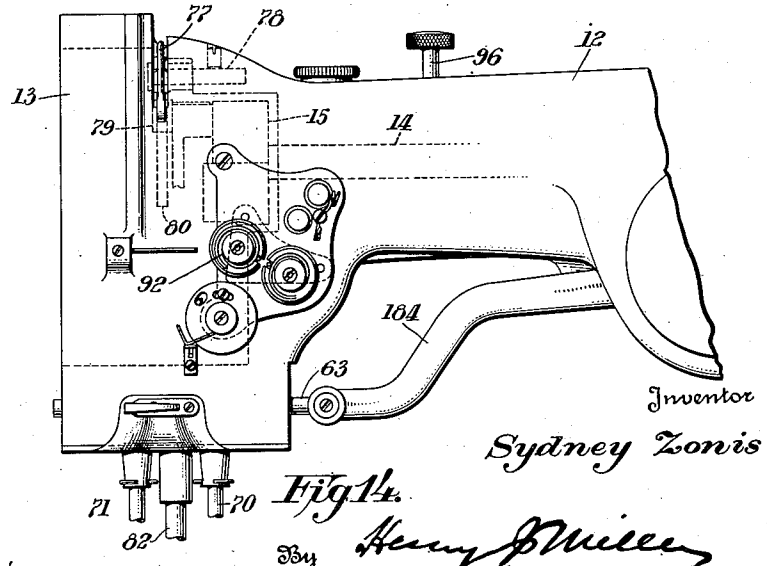

Fig. 14.

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ZIGZAG MACHINE WITH TWO NEEDLES AND TWO HOOKS

Filed Dec. 7, 1937 8 Sheets-Sheet 8

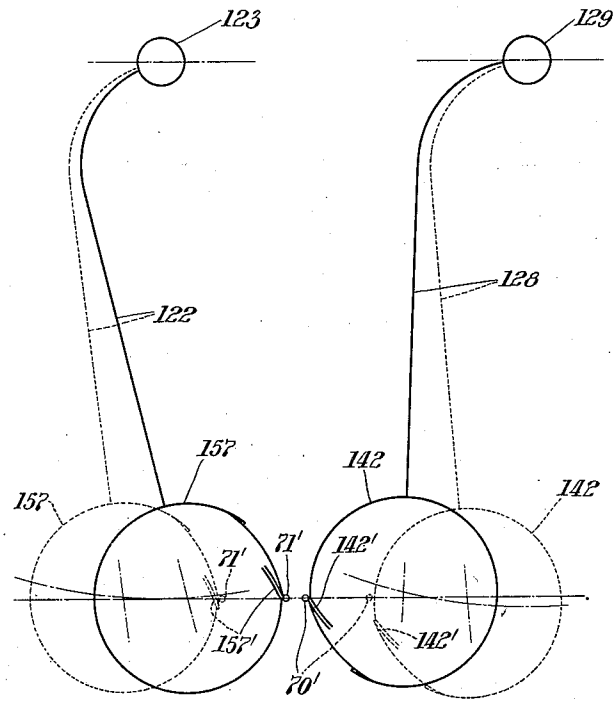

Fig. 15.

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Patented July 9, 1940 2,207,141

UNITED STATES PATENT OFFICE

2,207,141

ZIGZAG MACHINE WITH TWO NEEDLES AND TWO HOOKS

Sydney Zonis, Bridgeport, Conn., assignor to The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

Application December 7, 1937, Serial No. 178,477

13 Claims. (Cl. 112—159)

This invention relates to sewing machines and more particularly to zigzag sewing machines.

One of the objects of this invention is to provide an improved means for adjustably supporting the needle-bars.

Another object of this invention is to provide improved means for vibrating the stitch forming mechanism laterally of the line of seam formation and for adjusting the actuating mechanism which vibrates the needle and its cooperating loop-taker laterally of the line of seam formation.

Another object of this invention is to provide a plurality of eccentrics which are simultaneously adjustable by a single adjusting means.

A further object of this invention is to provide a new and novel actuating mechanism for the feed-bar. A still further object is to provide improved means of mounting a loop-taker for lateral movement.

Another object is the provision of a rotary hook operating about a vertical axis and mounted to swing or vibrate laterally on a vertical axis.

Another object is to locate the pivotal point about which the hook swings and to arrange the gears which actuate the hooks so that the swinging of the hook in the arc of a circle does not disturb the time relation between the needle and the hook.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

Figure 1 is a side elevation of a machine embodying my invention with portions of the machine cut away to expose the operating parts.

Figure 2 is a bottom plan view.

Figure 3 is a front end elevation of the machine, with the face plate removed and the bed partly cut away to expose the mechanism below the bed.

Figure 4 is a sectional view taken substantially along the line 4—4 of Figure 2.

Figure 5 is a rear end elevation of the machine, the frame being in section to expose the actuating mechanism.

Figures 6 and 7 are sectional views taken along the lines 6—6 and 7—7 of Figure 5.

Figure 8 is a sectional view taken substantially along the line 8—8 of Figure 3.

Figure 9 is a vertical section through a pair of the actuating eccentrics.

Figure 10 is an enlarged detailed view of the vertical axis hook, its supporting and actuating mechanism, and the feeding mechanism.

Figure 11 is a detailed section taken along the line 11—11 of Figure 10.

Figure 12 is an enlarged detailed plan view of the connection between the vibratory sleeve and one end of the loop-taker frame.

Figure 13 is a rear elevation of a portion of the head of the machine.

Figure 14 is a front elevation of a portion of the head of the machine showing the tension devices.

Figure 15 is a diagrammatic view illustrating the change in timing of the hook-beaks relative to their respective needles as a result of being swung about their pivot points.

Figure 16 is an enlarged detailed view partly in section, of the mechanism for actuating the feed-dog.

In the embodiment of this invention selected for illustration 10 represents the bed of the machine which carries the standard 11 and overhanging bracket-arm 12 which terminates in a hollow head 13. Journaled in bearings in the bracket-arm is a rotary needle-bar actuating shaft 14 having fixed to one of its ends the usual crank disk 15 and to its other end a balance wheel 16 having a pulley groove 17.

The shaft 14 has fixed to it a gear 18 meshing with a gear 19 fixed to the auxiliary hollow shaft 20, which is arranged at right angles to the shaft 14. The auxiliary shaft 20 has fixed to it by the set screws 20' a disk 21 and secured by the pivot screw 22', to one side of the disk is the flange 22 of an adjustable eccentric 23 (Figs. 6, 7 and 9).

Diametrically opposite the pivot screw 22' is a shouldered screw 24 which extends through the arcuate slot 25 in the flange 22 and into the disk 21 to limit the movement of the eccentric 23 and to hold the eccentric against the disk.

Pivotally secured by a pivot screw 26 to the other side of the disk 21 is a flange 27 of a second eccentric 28. A shouldered screw 29 passes through an arcuate slot 30 in the flange 27 and is screwed into the disk 21. The flange 27 of the eccentric 28 is provided with a radial bore which is tapped to receive the threads on a screw 32 formed with a reduced portion 33 which enters an aperture 34 in the shaft 20. The screw 33 may be adjusted and is held in its adjusted position by a jam screw 35. Diametrically oppo-

site the adjusting screw 32 a plunger 36 is urged against the shaft 20 by a coiled spring 37 which reacts against a screw 38. On the flange 22 of the eccentric 23 there is provided an adjustable stop screw 39 which is adapted to engage the periphery of the shaft 20 and is held in its adjusted position by a jam screw 40. Also in the flange 22 and diametrically opposite the stop screw 39 is a plunger 41 which is spring urged against the shaft 20 by a spring 42. The two eccentrics are connected together by a link 44 having a centrally arranged offset. (Figures 5 and 7.) One end of the link is pivotally secured to the flange 22 of the eccentric 23 by a pivot pin 45 and the other end is pivotally secured to the flange 27 by a pivot pin 46. From the foregoing it will be observed that the link 44 ties the two eccentrics 23 and 28 together so that when the throw of one eccentric is varied the throw of the other eccentric will be varied an equal amount in the opposite direction.

Extending into the longitudinal bore in the hollow shaft 20 is an adjusting rod 48 (Fig. 9) having an enlarged portion 49 formed on one end with an inclined surface 50 which engages the reduced portion 33 of the adjustable screw 32 to thereby adjust the throw the eccentrics. To prevent the adjusting rod being removed and also from turning relative to the shaft 20 a screw 51 enters the enlarged portion 49 of the rod and the head of the screw is guided by the walls of a slot 52 in the shaft 20. A threaded sleeve 53 embraces the reduced portion 48 and one of its ends engages the shoulder of the enlarged portion 49, the shoulder being held against the end of the sleeve by the nuts 56 on the other end of the rod 48. The sleeve 53 is provided with a knob 54 which is knurled and a flat spring 55 which engages the shaft 20 to increase friction. From the above it will be obvious that by turning the sleeve 53 the threaded portion, which coacts with the corresponding threads in the bore of the shaft 20, will cause the rod 48 to move in or out depending upon the direction that the sleeve is turned. This movement of the adjusting rod causes the inclined portion 50 of the rod, through the screw 32, to move the axes of the adjustable eccentrics 23 and 28 into or out of alignment with the axis of the shaft 20.

The eccentrics 60 and 61 on the other side of the gear 19 and their adjusting mechanism are similar to the eccentrics 23 and 28 and their adjusting mechanism. It will be understood that the eccentrics 60, 61 are arranged on the shaft 20 so that the needles move towards each other and away from each other simultaneously. It will be obvious, however, that the eccentrics may be arranged to move the needles in the same direction simultaneously.

Journaled in the hollow head 13 are two spaced parallel slide rods 63 and 64. Fixed to the slide bar 63 by a set screw 65 is a bearing bracket or sleeve 66 having an enlarged end 67 apertured to slidably receive the rod 64. Fixed to the rod 64 by the set screw 68 is a second bearing bracket or sleeve 69 with an enlarged apertured end 70 which embraces and is slidable on the rod 63. Journaled for reciprocatory endwise movement in the sleeves 66 and 69 are the needle-bars 70*a* and 71 carrying needles 70′ and 71′. The needle-bars 70*a* and 71 are reciprocated by means of a T-shaped link 72 having one of its ends pivotally secured to a pin on the crank disk 15 and its other end formed with a rod 73 which is slidably embraced by the slide blocks 74 and 75 fixed to the upper ends of the respective needle-bars. The T-shaped link 72 is guided to a right line movement by the means of a slot 76 formed in the hollow head 13 and which receives one end of the rod 73.

A take-up lever 77 is pivoted to the head of the machine 78 and is actuated by the crank disk 15 by means of the sleeve 79 and rod 80 in the usual and well known manner. Also journaled in the hollow head is the usual presser-bar 82 carrying a presser-foot 83. A member 84 (Figure 8) having a split hub portion which is clamped to the presser-bar has three laterally extending arms 85, 86 and 87. The end of the arm 85 is slidably received by a slot in a post 88 fixed to the head of the machine and the presser-bar 82 is thus prevented from turning about its longitudinal axes in its bearing. The arm 87 is formed with an upstanding portion 90 which is adapted to engage a pin 91 extending through the head of the machine. The pin 91 cooperates, in the usual and well known manner, with the tension devices 92 to release the tension when the presser-foot is raised. The arm 86 extends towards the rear of the machine and overlying the arm near the hub is one end of a spring 94 which has its other end pivotally secured at 95 to the bracket arm. The spring reacts near its center portion with the adjusting screw 96 to constantly urge the presser-bar downwardly. The presser-bar may be raised and lowered by means of a lever 99 pivoted to the head of the machine at 100 and having a cam portion 101 which cooperates with the arm 86 in the usual and well known manner.

Journaled beneath the bed in the bearing lugs 105, 106 and 107 is a rotatable shaft 108 having fixed to one of its ends a pulley 109 which is driven from the needle-bar actuating shaft by means of a pulley 111 fixed on the upper shaft and a clip belt 110. A bearing bushing 112 extends beyond the bearing lug 106 and clamped to the bushing is the split hub 113 of a saddle 114. The saddle 114 is adjustably secured to the bed 10 by means of an L-shaped bracket 115 and the screws 116. A bearing bushing 117 extends beyond the bearing lug 107 and is embraced by the split hub 118 of a second saddle 119 which is adjustably secured to the bed of the machine by means of the L-shaped bracket 120 and the screws 121. A hook supporting frame 122 has one of its ends pivoted on a short shaft 123 which is journaled in the saddle 119 and its other end pivotally secured by the stud 124 to a rod 125 journaled for endwise reciprocatory movement in the bearing lugs 126. A second hook supporting frame 128 has one of its ends pivoted on the short shaft 129 which is journaled in the saddle 114 and its other end pivoted on a stud 130 fixed to a sleeve 131 which is slidable on the rod 125 and in the bearing lug 132.

Fixed to the shaft 108 is a gear 135 which meshes with a gear 136 fixed to the short vertical shaft 129. The ratio of these gears is as 1:2, therefore the shaft 129 makes two complete revolutions for each revolution of the shaft 108. The gear 136 meshes with a gear 137 fixed to a shaft 138 journaled in bearings in the supporting frame 128 (Figures 2 and 10). Fixed to the other end of the shaft 138 is a gear 139 meshing with a gear 140 fast on the vertical shaft 141 which carries at its upper end a rotary hook 142. Fixed to the shaft 138 is an eccentric 143, which actuates through the yolk 144 a pivoted arm 145, a bobbin-case opener 146. A rotation restraining

finger 147 is fixed to the frame 128 and enters the usual notch in the bobbin-case 148.

Also fixed to the shaft 108 is a gear 149 which meshes with a gear 150 fixed to the short shaft 123. The ratio of these gears is as one is to two and therefore the gear 150 makes two complete rotations for each rotation of the gear 149. The gear 150 meshes with a gear 151 on the shaft 152 which is journaled in the supporting frame 122. The shaft 152 has fixed to it a gear 153 meshing with a gear 154 carried by a vertical shaft 155 which has secured to its upper end the hook 157. A bobbin-case opener 160 similar to that described for the hook 142 is provided. Rotation restraining fingers 161 and 162 are carried by the frame 122 and receive between their free ends a lug 163 carried by the bobbin-case 164. The above described hook and actuating mechanism therefor is similar to that shown and described in the patent to W. Myers, No. 1,999,978, dated Apr. 30, 1935.

It will be understood that the frame 122 and hook 157 are pivoted to swing in the arcs of circles about the center of the shaft 123 as an axis, therefore, some play must be allowed in the connection between the slide rod 125 and the end of the frame 122. As shown in Figure 11 the connection comprises a stud 124 formed with a hub 166 which is fixed to the rod 125 by a set screw 167, the end of the frame 122 being held on the stud by a cap screw 168. It will be noted that there is sufficient clearance between the stud 124 and also the collar 169 and the apertures in the end of the frame 122 to avoid cramping when the hook and frame are shifted. As shown in Figure 12 there is sufficient clearance between the stud 130 and the aperture in the end of the frame 128 to permit the frame to swing about its pivot. A screw 170 is provided to hold the end of the frame 128 on the stud 130.

To vibrate the loop-taker 157 and its frame 122 the rod 125 has fixed to it a pivot pin 171 to which one end of a link 172 is pivotally secured. The other end of the link 172 is pivotally secured to one end of a bell-crank lever 174 which is rockably supported on a shaft 175 journaled transversely in the standard of the machine. The other arm of the bell-crank lever 174 is pivotally secured to one end of a pitman 176 which has a strap embracing the eccentric 61. The eccentric 60, which is connected to the eccentric 61 by a link 60', is connected by the pitman 184' to the slide rod 64 which controls the lateral position of the needle-bar 71.

To vibrate the loop-taker 142 and the frame 128 there is secured to the sleeve 131 a pivot stud 180. A link 181 has one of its ends embracing the pivot stud 180 and its other end pivotally secured to one arm of a bell-crank lever 182 carried by the shaft 175. The other arm of the bell-crank lever 182 is pivotally secured to a pitman 183 which has a strap embracing the eccentric 23. The eccentric 23 is connected by the link 44 to the eccentric 28 which actuates a pitman 184 connected to the rod 63 which controls the lateral position of the needle-bar 70a. From the foregoing it will be obvious that the two eccentrics 23 and 28 are connected by a link so that they may be adjusted the same amount by a single adjusting means. Therefore, when the lateral throw of the needle-bar is varied the throw of the cooperating hook is varied the same amount and consequently the needle and its cooperating hook are adjusted simultaneously and retain at all times their positions relative to each other. The eccentrics 60 and 61 are connected by a link 60' and are identical in size and shape with the eccentrics 23 and 28, and, therefore, the needle 71' and its cooperating hook are adjusted by a single means and also maintain their positions relative to each other at all times regardless of the lateral throw. It will be understood that the positions of the pivot points for the links 176 and 183 and the bell-crank levers 174 and 182 are selected with respect to the centers of their actuating eccentrics, and the location of the needle-bar slide-rods 63 and 64 are also selected relative to the center of their actuating eccentrics so that each needle-bar and its cooperating hook are displaceed laterally an equal distance for a given throw of the eccentrics.

As illustrated in Figure 15 the needles 70' and 71' move in a straight line and the hooks 142 and 157 swing in the arc of a circle about the pivot points 123 and 129. As indicated by the the full and dotted line position of the parts, when the hooks swing away from each other the beak 142' of the hook 142 would be advanced and the beak 157' would be retarded relative to their respective needles if no provisions were made for keeping the hook-beaks in time. To obviate this difficulty the gears 135 and 136 are so arranged that the gear 136 will rotate in a clockwise direction, as viewed in Fig. 10, and the teeth of the gear 137 are cut on an angle so that when the hook 142 is swung outwardly the rolling of the gear 137 on the gear 136 will cause the shaft 138 to be moved in a direction to advance the hook-beak 157' relative to the needle 70'. The gear 150 rotates in a counter-clockwise direction, as viewed in Figure 10, and the teeth of the gear 151 are cut on an angle so as to cause the beak 142' of the hook 142 to be retarded relative to the needle 71' when the hook 142 is swung outwardly. It will be understood that the above described condition is reversed when the hooks swing towards each other.

The feeding mechanism comprises a feed-bar 190 carrying a feed-dog 191 which extends through openings in the throat-plate 220 and cooperates with the presser-foot 83. The feed-bar 190 is pivotally secured intermediate its ends by a pivot pin 192 to a lug 193 fixed to the base of the machine (Figure 4). In order to permit the feed-bar 190 to slide back and forth the pivot pin 192 is received by an apertured block 195 (Figure 4) which is slidable in a slot 196 in the feed-bar. The feed-bar 190 is formed with an apertured boss 197. The aperture in the boss receives a slide-pin 198 which is held in position by a screw 211 (Figure 16). The pin 198 is longitudinally slidable in a bore in the enlarged boss 199 formed on a strap 200 which embraces an eccentric 201 fixed on the shaft 108. The slide-pin 198 is formed with an enlarged portion 210 which is formed eccentric to the pin. The screw 211 may be loosened and a screw driver may be inserted in the slot 212 formed in the pin 198. The pin may then be turned to adjust the work-engaging surface of the feed-dog 191 relative to the top surface of the throat-plate 220.

Fixed to the feed-bar 190 by the set screw 221 is a second slide-pin 222 arranged substantially at right angles to the slide-pin 198 and having an eccentric portion 223 which is received in a suitable aperture in the feed-bar. The pin 222 is slidable in an aperture in the boss 224 of a strap 225 which embraces the adjustable eccentric 225'. It will be obvious that the feed-

dog 191 may be centered in the slot in the throat-plate by adjusting the pin 222 about its longitudinal axis.

The adjustable eccentric is carried by a plate 226 slidable in, and adjustable relative to, a disk 227 which is fixed to the shaft 108. The adjustable eccentric is the same as that shown and described in the patent to W. Myers, No. 2,063,264, dated Dec. 8, 1936, to which reference may be had for a more complete description. A stop pin 228 (Figure 4) is carried by the bed 10 for the purpose of adjusting the eccentric 225 to thereby vary the amount of feeding movement imparted to the feed-dog.

It will be observed that the slide-pin 198 is located above the shaft 108. This construction places the load over the shaft and prevents cramping of the parts.

From the foregoing description considered in connection with the accompanying drawings, the construction, manner of operation and several advantages of my improved sewing machine will be clearly and fully understood. It is apparent that such a machine has a wide variety of uses, and it will be understood that the form, construction and arrangement of the elements employed may be varied. Therefore, the privilege is reserved of resorting to all such legitimate changes therein as may be fairly embodied within the spirit and scope of the appended claims.

Having thus set forth the nature of the invention, what I claim herein is:

1. A sewing machine having, in combination, a pair of slide-rods, a needle-bar bracket secured to the first slide-rod and slidable on the second, a second needle-bar bracket secured to the second slide-rod and slidable on the first, needle-bars journaled in said brackets, and means for reciprocating said needle-bars.

2. A sewing machine having, in combination, a pair of slide-rods, a needle-bar bracket secured to the first slide-rod and slidable on the second, a second needle-bar bracket secured to the second slide-rod and slidable on the first, needle-bars journaled in said brackets, means for actuating said needle-bars and means for vibrating said rods.

3. In combination with a sewing machine having a supporting head, two spaced horizontally disposed and parallel bars carried by said head, two bearing brackets one of which is fixed to the first of the bars and slidable on the second and the other fixed to the second of said bars and slidable on the first, needle-bars journaled in said bearing brackets, and means for reciprocating said needle-bars.

4. In combination with a sewing machine having a supporting head, two spaced horizontally disposed and parallel bars carried by said head, two bearing brackets one of which is adjustably secured to the first of the bars and slidable on the second and the other adjustably fixed to the second of said bars and slidable on the first, needle-bars journaled in said bearing brackets, and means for reciprocating said needle-bars.

5. In combination with a sewing machine having a supporting head, two spaced horizontally disposed and parallel bars carried by said head, two bearing brackets one of which is adjustably secured to the first of the bars and slidable on the second and the other adjustably fixed to the second of said bars and slidable on the first, needle-bars journaled in said bearing brackets, means for reciprocating said needle-bars, and adjustable eccentrics for vibrating said bars.

6. A sewing machine having, in combination, a reciprocatory needle-bar carrying a needle, a loop-taker cooperating with said needle to form stitches, actuating means for said needle-bar and said loop-taker, a shaft driven by said actuating means, adjustable eccentrics on said shaft for vibrating said needle-bar and loop-taker laterally of the line of seam formation, and a single means for simultaneously adjusting said eccentrics.

7. A sewing machine having, in combination, a reciprocatory needle-bar carrying a needle, a loop-taker coordinated with said needle to form stitches, adjustable eccentrics for vibrating said needle-bar and loop-taker laterally of the line of seam formation, linkage connecting said eccentrics whereby they are caused to move an equal amount in opposite directions, and means for adjusting one of said eccentrics.

8. A sewing machine having in combination, a reciprocatory needle, a loop-taker cooperating therewith to form stitches, means for actuating said needle and loop-taker, a pair of eccentrics for vibrating said needle and loop-taker laterally, means for simultaneously adjusting said eccentrics, a second reciprocatory needle, a loop-taker cooperating therewith, a pair of eccentrics for vibrating said second needle and loop-taker laterally, and means for adjusting said eccentrics simultaneously.

9. In a zigzag sewing machine the combination of, a reciprocatory needle, a rotary hook operable about a vertical axis and cooperating with said needle to form stitches, feeding mechanism for advancing the work, mechanism for vibrating said needle and hook laterally of the line of feed, said hook vibrating about a pivot point disposed at a distance from the axis of rotation of the hook and located in the direction of the line of feed, and means for maintaining the needle and hook in timed relation regardless of the amount of lateral throw.

10. In a zigzag sewing machine the combination of, a reciprocatory needle, a rotary hook cooperating with said needle to form stitches, feeding mechanism for advancing the work, means for simultaneously vibrating said needle and hook laterally of the line of seam formation, said means including a pair of adjustable eccentrics which are connected together so that they may be adjusted simultaneously by a single means.

11. A sewing machine including, a bed, standard and overhanging bracket-arm, a needle-bar actuating shaft located in said bracket-arm, a pair of needle-bars actuated thereby, a pair of rotary hooks located beneath said bed and cooperating with said needles to form stitches, a shaft located in the bracket-arm and arranged at right angles to said needle-bar actuating shaft, means for driving said last mentioned shaft from said needle-bar shaft, eccentrics located on opposite sides of said driving means, and mechanism connecting said hooks and needle-bars with said eccentrics whereby said needle-bars and the hooks may be vibrated laterally of the line of seam formation.

12. In a sewing machine having a work-support, reciprocatory needle-bars carrying needles and located above said work-support, a pair of hook-supporting frames pivotally supported at one end and arranged beneath said work-support for movement about vertical axes, rotary hooks carried by each of said frames and cooperating with said needles to form stitches, a bob-

bin-case opener carried by each of said frames, means for vibrating said needles laterally of the line of seam formation, and mechanism connected to the free ends of said hook-supporting frames for oscillating said frames about their vertical axes in timed relation with the vibratory movement of said needles.

13. In combination with a sewing machine, a pair of needle-bars, needles carried by said needle-bars, loop-takers cooperating with said needles to form stitches, means for vibrating said needle-bars laterally of the line of seam formation, mechanism for simultaneously vibrating said loop-takers laterally of the line of seam formation about vertical axes and means for maintaining said loop-takers in timed relation with said needles.

SYDNEY ZONIS.

CERTIFICATE OF CORRECTION.

Patent No. 2,207,141. July 9, 1940.

SYDNEY ZONIS.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 14, strike out "restraining fingers 161 and 162 are carried by the" and insert the same after the word "rotation" in line 15; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 13th day of August, A. D. 1940.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.