March 27, 1962 R. E. JOHNSON 3,026,831

ZIGZAG MECHANISMS FOR SEWING MACHINES

Filed Dec. 2, 1957 4 Sheets-Sheet 1

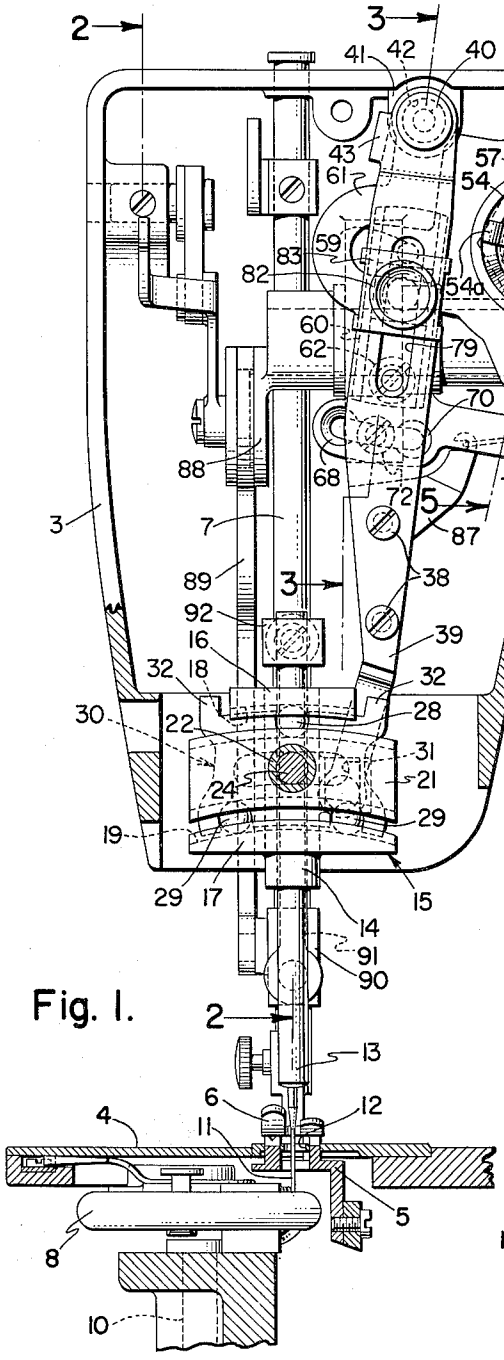


Fig. 1.

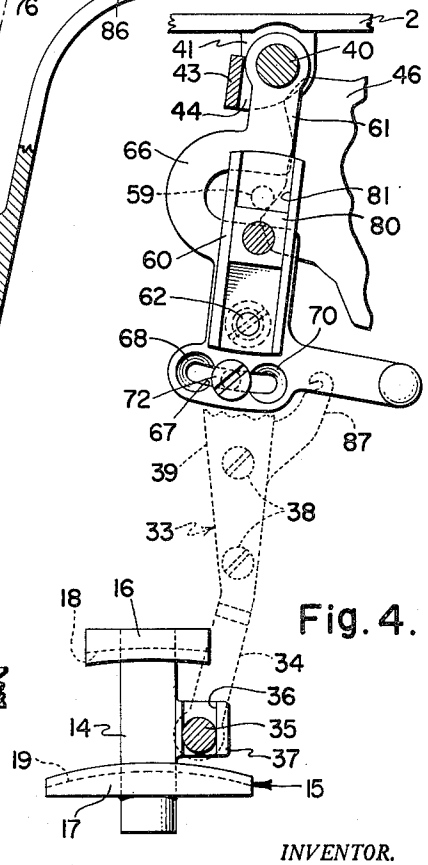


Fig. 4.

INVENTOR.
Ralph E. Johnson

WITNESS
Nicholas Leszczak

BY
Marshall J. Breen
ATTORNEY

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ZIGZAG MECHANISMS FOR SEWING MACHINES

Filed Dec. 2, 1957 4 Sheets-Sheet 2

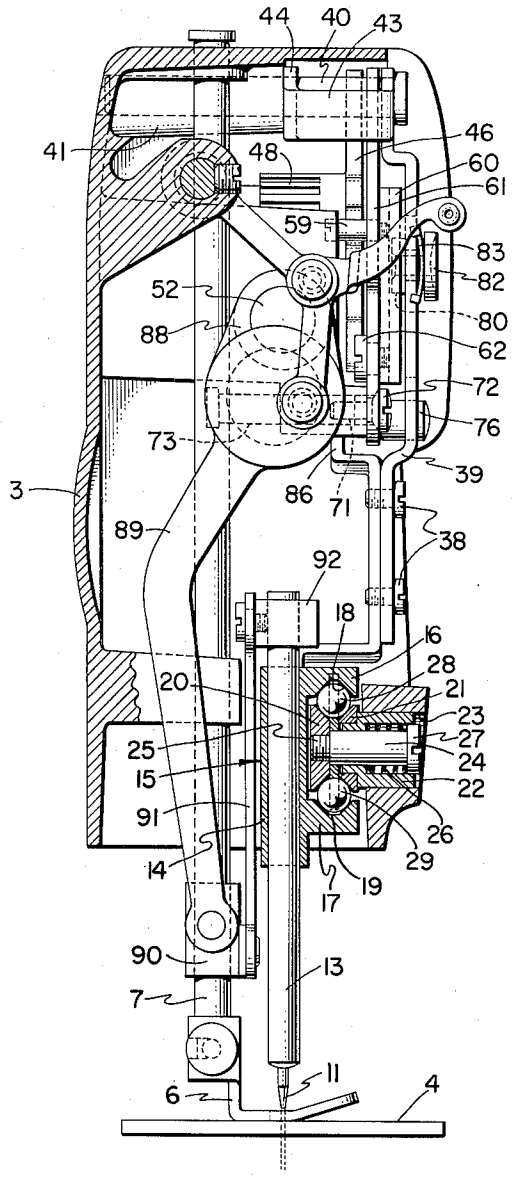


Fig. 2.

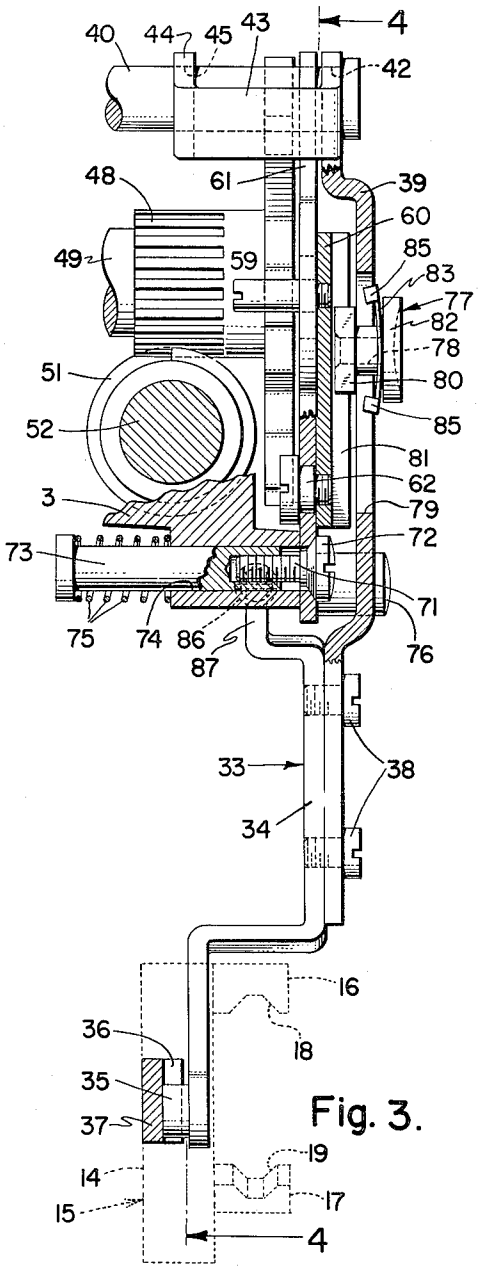


Fig. 3.

INVENTOR.
Ralph E. Johnson

WITNESS
Nicholas Leszczak

BY
Marshall J. Breen
ATTORNEY

March 27, 1962 R. E. JOHNSON 3,026,831

ZIGZAG MECHANISMS FOR SEWING MACHINES

Filed Dec. 2, 1957 4 Sheets-Sheet 3

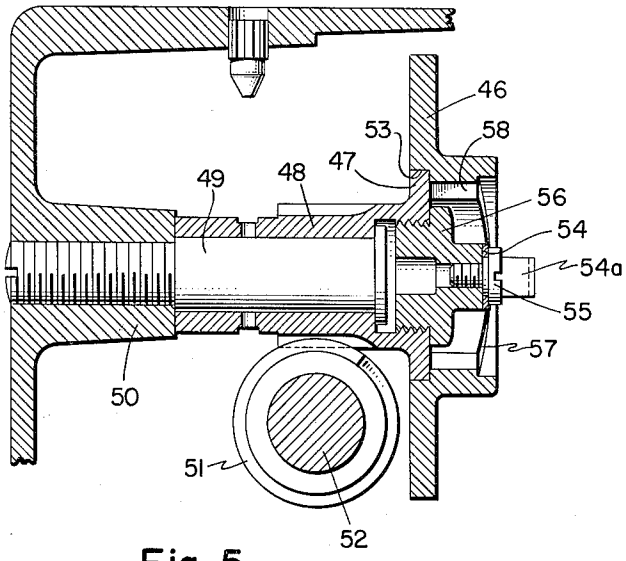


Fig. 5.

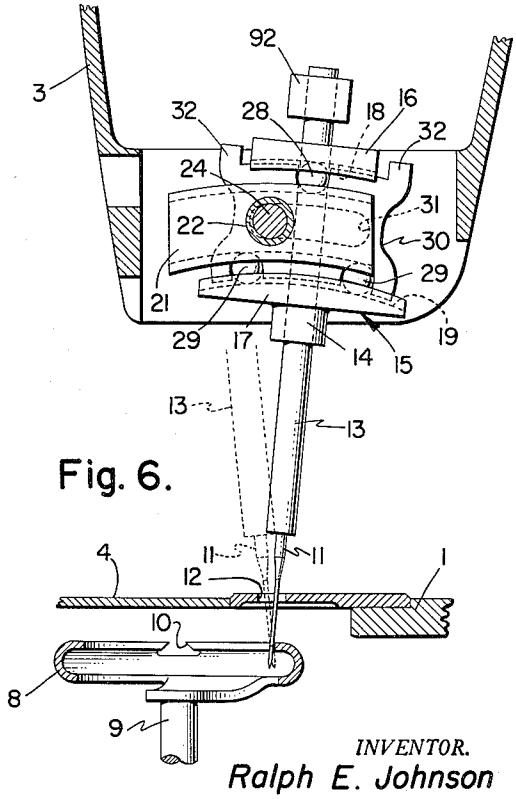


Fig. 6.

INVENTOR.
Ralph E. Johnson

WITNESS
Nicholas Leszczak

BY
Marshall J. Breen
ATTORNEY

March 27, 1962 R. E. JOHNSON 3,026,831

ZIGZAG MECHANISMS FOR SEWING MACHINES

Filed Dec. 2, 1957 4 Sheets-Sheet 4

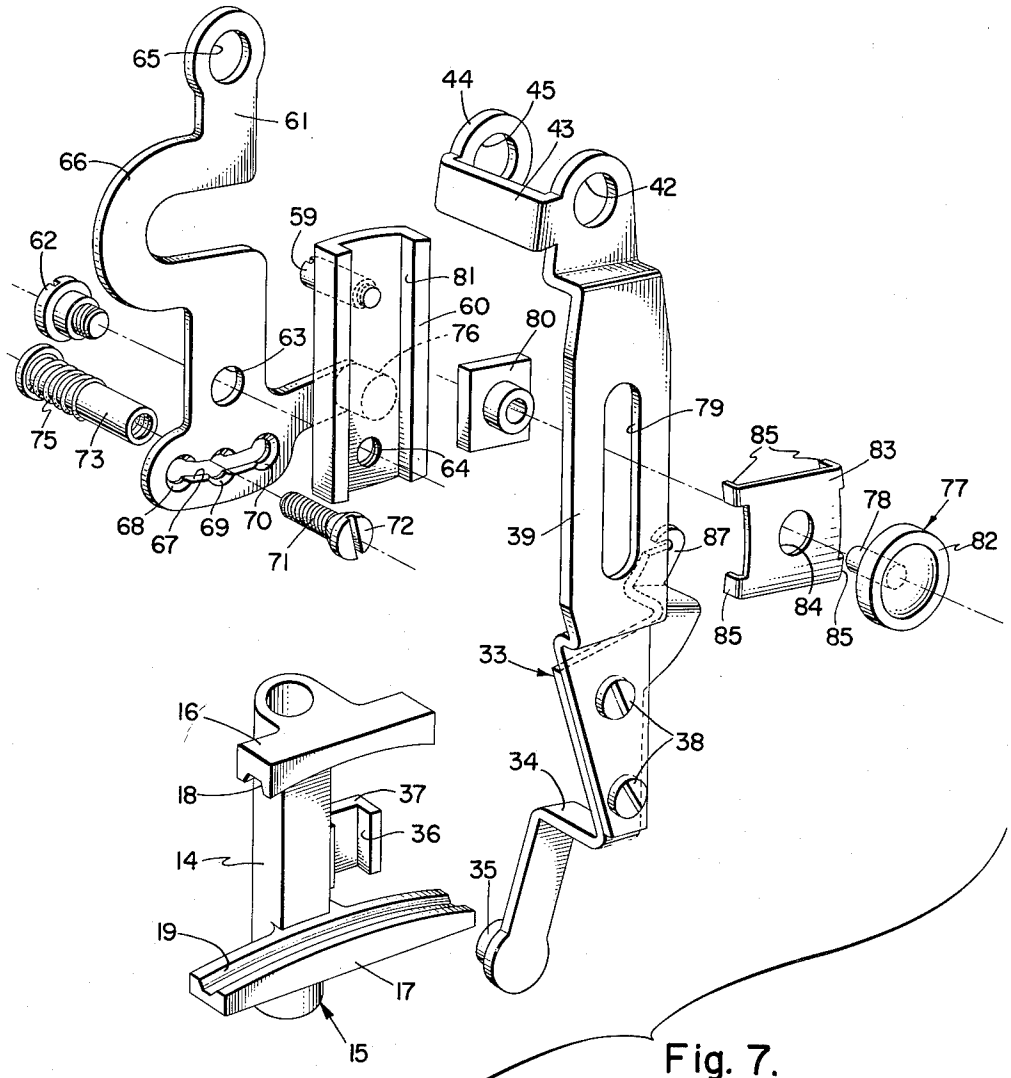


Fig. 7.

INVENTOR.
Ralph E. Johnson

WITNESS
Nicholas Leszczak

BY
Marshall J. Breen
ATTORNEY

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Patented Mar. 27, 1962

3,026,831

ZIGZAG MECHANISMS FOR SEWING MACHINES

Ralph E. Johnson, Mountainside, N.J., assignor to The Singer Manufacturing Company, Elizabeth, N.J., a corporation of New Jersey

Filed Dec. 2, 1957, Ser. No. 700,108
10 Claims. (Cl. 112—158)

The present invention relates to sewing machines and particularly to a zigzag mechanism for sewing machines.

It is an object of this invention to provide a zigzag mechanism for sewing machines which can be used with a wide variety of different loop taker mechanisms. This object is attained by the provision of a needle bar mechanism in which the needle, despite the fact that it may upon successive stitches penetrate the work at points spaced laterally of the line of feed or the line of seam formation, will always be located at the same point relative to the beak of the loop taker at loop seizure. Thus, a zigzag mechanism in accordance with the present invention can be used with a loop taker that cannot accommodate lateral vibrations of the needle, or in other words, a loop taker which because of its peculiar characteristics could not effect loop seizure from a needle that upon successive stitches presents its loop to the loop taker at different points.

Having in mind the above and other objects that will be evident from an understanding of this disclosure, the invention comprises the devices, combinations and arrangements of parts as illustrated in the presently preferred embodiment of the invention which is hereinafter set forth in such detail as to enable those skilled in the art readily to understand the function, operation, construction and advantages of it when read in conjunction with the accompanying drawings in which:

FIG. 1 is a fragmentary vertical sectional view longitudinally of the head end of a sewing machine embodying the present invention.

FIG. 2 is a frangmentary vertical sectional view transversely of the head of the sewing machine illustrated in FIG. 1 and taken substantially on the line 2—2 of FIG. 1.

FIG. 3 is a fragmentary sectional view taken substantially on the line 3—3 of FIG. 1 with portions of the mechanisms that do not actually appear being included in dotted lines.

FIG. 4 is a fragmentary sectional view taken substantially on the line 4—4 of FIG. 3.

FIG. 5 is a detail sectional view taken substantially on the line 5—5 of FIG. 1.

FIG. 6 is a detail sectional view similar to FIG. 1 but with many of the parts omitted for clarity and illustrating the different positions of the needle in the opposite extreme positions of lateral vibration.

FIG. 7 is an exploded perspective view of the zigzag mechanism illustrated in FIG. 1.

With reference to the drawings, the present invention is illustrated as embodied in a sewing machine having a frame comprising a bed having a bed plate 1 and a bracket arm 2 terminating in a head 3 overhanging the bed. Adjacent to the point of stitch formation, the bed plate 1 has a throat plate 4 through slots in which a feed dog 5 operates to feed the work and thereby define a line of feed or a line of seam formation. The work is held against the throat plate 4 and feed dog 5 by a presser mechanism including a presser foot 6 upon the lower end of a presser bar 7 mounted in the head 3.

The stitching mechanism of the illustrated machine comprises a vertical axis oscillating hook 8 upon the upper end of a hook shaft 9 that is journaled in the bed of the machine, which hook has a loop seizing beak 10, FIG. 6. The hook is only illustrated generally in the drawings since it is old and well-known and is fully disclosed for example in the United States patent of Diehl et al., No. 663,696, Dec. 11, 1900, to which reference may be made. Cooperating with the hook 8 is a needle 11 operating through a laterally elongated slot 12 in the throat plate 4 and mounted upon the lower end of an endwise reciprocating needle bar 13 that is in turn mounted in the head 3 for endwise reciprocation and for vibration laterally of the line of feed to thereby provide a zigzag stitch pattern.

The point of loop seizure is determined by the particular characteristics and a physical arrangement of the loop taker. The relationship of the needle relative to the beak of the loop taker at loop seizure is of course critical. In a hook of the type illustrated, upon angular movement of the hook 8, the loop seizing beak 10 thereof defines a circular path about the axis of the shaft 9 and the needle 11 moves in a path that at the point of loop seizure is arranged closely adjacent to the path of the beak 10 to present a loop of thread to the beak 10. Lateral vibrations of the needle bar which would effect a lateral displacement of the needle relative to the path of movement of the beak 10 at loop seizure, would result in a slipped stitch. At the same time, in other loop takers which could accommodate lateral displacement of the needle at loop seizure, there is still a designed point in the path of the loop seizing beak which represents the optimum point of cooperation at loop seizure between the loop seizing beak and the needle. In accordance with the present invention, there is provided a zigzag mechanism in which the needle penetrates the work at points spaced laterally of the line of feed to produce a zigzag pattern of stitches but in which the needle always presents its loop to the beak 10 at the same point in its cycle. Briefly, with reference to FIG. 6, this is accomplished by mounting the needle bar for oscillation about an axis coinciding with the designed point of loop seizure on the path of the beak 10. Thus, the needle approaches the point of loop seizure at different angles so that it will penetrate the work at points spaced laterally of the line of feed, but it will always intersect the designed point of loop seizure.

In accordance with the present invention, the needle bar 13 is mounted for endwise reciprocation in a bearing sleeve 14 forming a part of a supporting frame or bracket 15 which is supported in the head 3 for movement in a plane laterally of the line of feed by means of a pair of opposed ball tracks including an upper track 16 and a lower track 17 formed thereon and having grooves or ball runs 18 and 19 respectively in the opposed faces thereof. Disposed between the tracks 16 and 17, FIG. 2, is an inner two-part self-aligning ball run comprising an inner plate 20 and an outer plate 21 having the upper and lower opposed edges thereof bevelled to define grooves or ball runs that are opposed to the grooves 18 and 19. The outer plate 21 is mounted on the reduced end of a sleeve 22, this is slidably fitted into a bore 23 in the head 3. A stud 24 extends axially through the sleeve 22 and has a reduced threaded end 25 that is screwed into the inner plate 20. A spring 26 is mounted on the stud 24 and acts between a head 27 on the free end of the stud 24 and the sleeve 22 at the shoulder formed at the reduced end of the sleeve, thus resiliently urging the plates 20 and 21 together. A single bearing ball 28 is mounted in the ball run defined by the groove 18 and the bevelled upper edges of the plates 20 and 21 and a pair of bearing balls 29 are mounted in the ball run defined by the groove 19 and the bevelled lower edges of the plates 20 and 21. The ball 28 is mounted to operate substantially in the center of the track 16 while the balls 29 are mounted to operate adjacent to the opposite ends of the track 17. The

balls 28 and 29 are held in place by a ball retainer 30 in the form of a plate that is mounted on the stud 24 between the plates 20 and 21 and is provided with notches in the edges thereof to accommodate the balls. The stud 24 passes through an elongated slot 31 in the ball retainer 30 to provide for lateral movement of the ball retainer relative to the stud. The upper corners of the ball retainer 30 are provided with ears 32 that engage the ends of the track 16 to limit the lateral movement of the ball retainer relative to the track 16.

The bracket 15 is mounted in the above manner for movement laterally of the line of feed and as it is moved, the needle bar 13 which is carried thereby will also be moved laterally of the line of feed. To provide for lateral vibration of the needle relative to the work while at the same time providing for intersection of the path of the beak 10 at the same point upon each stitch thus defining a constant or non-varying point of loop seizure as illustrated in FIG. 6, the tracks 16 and 17 are arcuate with the axis thereof coinciding with the desired point of loop seizure. In this manner, as the bracket 15 is moved laterally, it is tilted so that the axis of the needle bar will always be directed toward the point of loop seizure.

Lateral movement is imparted to the bracket 15 by a two-part lever 33 having a lower portion 34 including a stud 35 on the lower end thereof which engages in a groove 36 formed in a lug 37 integral with the bracket. The lower portion 34 of the lever 33 is secured by screws 38 to an upper portion 39 that is pivotally mounted at its upper end on a heated stud 40 supported by a lug 41 in the head 3, the upper portion 39 of the lever 33 having an aperture 42 through which the stud 40 extends. To prevent cocking and binding of the lever 33 on the stud 40, there is provided on the upper portion 39 a transverse arm 43 carrying an ear 44 having an aperture 45 through which the stud extends. The stud 40 is arranged on a horizontal axis parallel to the line of feed to define a plane of oscillation of the lever 33 that is normal to the line of feed. The lever 33 is held against movement axially of the stud 40 by engagement of the upper portion 39 and the ear 44 with the head of the stud and the end of the lug 41 respectively.

Oscillation is imparted to the lever 33 by a pattern cam 46 secured to a flange 47, FIG. 5, integral with a gear 48 which is is journaled upon a stud 49 secured on an axis parallel to the axis of the stud 40 in a lug 50 in the head 3. Rotation is imparted to the gear 48 and thus to the pattern cam 46 by a worm 51 on the main shaft 52 of the machine, which is journaled longitudinally of the bracket arm 2. To key the cam 46 to the flange 47 for rotation, the hub of the cam 46 is provided with a recess 53 in the rear face thereof to receive the flange 47, the recess 53 and the flange 47 being hexagonal, see FIG. 1. The cam 46 is releasably held on the flange 47 by a leaf spring 54 mounted intermediate its ends by a pivot screw 55 upon the outer end of a plug 56 that is threaded into the end of the gear 48, the hub of the cam 46 being apertured centrally to accommodate the plug 56. The opposite ends of the spring 54 overlie annular shoulders 57 formed in the hub of the cam 46. The shoulders 57 are formed to provide slots 58 between the ends thereof, FIG. 1, and are convex, FIG. 5, thus, to remove the cam 46 and to replace it with another cam having a different stitch pattern, the spring 54 is rotated one-quarter of a turn to position the ends of the spring opposite the slots 58, the spring 54*a* having the ends thereof turned upwardly to provide finger pieces 54 for facilitating it. The cam 46 is then free to be withdrawn axially from the flange 47. The new cam is inserted axially onto the flange 47 and is secured thereon by a one-quarter turn of the spring 54. The spring 54 is designed so that when relaxed it will ride over the ends of the shoulders 57 and will be flexed as it slides onto the crown thereof to hold the cam 46 resiliently in place.

A cam follower 59 comprising a stud having a threaded end cooperating with the periphery of the cam 46 is screwed into the back of a pivot block 60 which is mounted on a lever 61 by means of a pivot screw 62 having a smooth portion of the shank extending loosely through an aperture 63, FIG. 7, in the lever 61 and a reduced threaded end screwed into an aperture 64 in the block 60. At its upper end the lever 61 is provided with an aperture 65 through which the stud 40 extends to pivotally mount the lever in the head 3. The central portion of the lever 61 is offset at 66 to provide clearance for the follower 59 upon oscillation thereof. To hold the lever 61 against pivotal movement about the stud 40 it is provided in the lower end thereof with a slot 67 having three enlargements or lands 68, 69 and 70 formed at the left, center and right thereof respectively. A screw 71 extends through the slot 67 and is provided with an enlarged head 72 having a conical face that is adapted to be seated in one of the lands of the slot 67, the shank of the screw 71 being small enough to extend loosely through the slot 67 to provide for free pivotal movement of the lever 61 relative to the screw. The screw 71 is threaded into the end of a plunger 73, FIG. 3, mounted for axial sliding movement in a bore 74 of the head 3 and having a free end about which is coiled a spring 75. The spring 75 acts between the head of the plunger and the head 3 to bias the plunger in the direction to seat the head 72 in one of the lands 68, 69 or 70. There is provided a handle 76 on the lever 61 by means of which the lever can be manually pivoted. When the lever 61 is pivoted, the head 72 of the screw 71 will be unseated against the action of the spring 75 from the land it is in, and will reseat itself in the adjacent one of the lands when the lever is moved to the desired position.

The lever 33 is adjustably coupled for oscillation to the pivot block 60 by a stud or rivet 77 having a shank 78 extending through an elongated slot 79 longitudinally of the upper portion 39 of the lever 33 and fastened to a slide block 80. The pivot block 60 has a guide way 81 in the front face thereof that receives the slide block 80. The rivet 77 has a head 82 for manually adjusting the same in the guideway 81. A dish spring 83 is disposed between the head 82 and the lever 33 to hold the slide block 80 frictionally in adjusted position, the spring 83 having an aperture 84 centrally thereof through which the rivet shank 78 passes and a pair of ears 85 on each side thereof for engaging the sides of the lever 33.

The follower 59 is held against the periphery of the cam 46 by a spring 86 anchored at one end (not shown) to the bracket arm 2 and connected at the other end to an arm 87 integral with the lower portion 34 of the lever 33. The spring 86 acts through the lever 33, the rivet 77 and slide block 80 to pivot the block 60 about the axis of the pivot screw 62 and thus bias the follower 59 against the periphery of the cam 46.

Endwise reciprocation is imparted to the needle bar 13 by the main shaft 52 through a crank 88 on the main shaft which is connected by a drive link 89 with a sleeve 90 slidably mounted on the presser bar 7 of the machine. The sleeve 90 which serves as an anchor for the end of the link 89 is connected by a connecting link 91 with a collar 92 secured on the upper end of the needle bar 13. This connection provides a drive for the needle bar 13 which will accommodate lateral vibrations of the needle bar with a minimum of effect upon the cycle of the needle bar, the drive being applied as a pull directed substantially axially of the needle bar and the length of the link 91 being great enough so that while it would act as an anchor link upon lateral movement of the needle bar, it would effect substantially no endwise displacement of the needle bar.

In operation upon rotation of the main shaft 52, rotation is imparted to the cam 46 which will in turn, together

with the return spring 86, impart oscillation about the axis of the screw 62 to the pivot block 60. The pivot block 60 carries with it the slide block 80 and through the rivet 77 imparts oscillation about the stud 40 to the lever 33, which is connected to the needle bar supporting bracket 15 through the stud 35 and thereby effects lateral vibrations of the needle bar. The amount of oscillation imparted to the lever 33 and thus to the needle bar depends upon the position of the slide block 80 relative to the axis of the screw 62 about which it oscillates. Moving the slide block 80 away from the axis of the screw 62 increases the amount of motion imparted to the slide block 80 and also brings it closer to the pivot axis of the lever 33 which is at the stud 40, thus increasing the amount of oscillation imparted to the lever 33. The head 82 of the rivet 77 provides for manual adjustment of the slide block 80 in the guideway 81 while the spring 83 maintains it in adjusted position.

The lever 61 provides for adjustment of the neutral position of the needle bar, or the straight-line stitching position of the needle. When the lever is set with the head 72 of the screw 71 seated in the land 69, the stitch pattern will be centered. By shifting the lever to the left or right to seat the head 72 in the lands 68 or 70, the neutral position will correspondingly be shifted to the left or right.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure relates to a preferred embodiment of my invention which is for purposes of illustration only and not to be construed as a limitation of the invention. All such modifications which do not depart from the spirit of the invention are intended to be included with the scope of the appended claims.

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

1. In a sewing machine having a frame including a bed and a bracket arm terminating in a head overhanging said bed, feeding mechanism in said bed defining a line of feed, a loop taker mounted in said bed and having a loop seizing beak, means for actuating said loop taker and thereby defining a path of movement of said loop seizing beak, a needle bar having a needle secured to the lower end thereof, means for mounting said needle bar in said head for endwise reciprocation thereof for passing said needle through a point adjacent to the path of movement of and in loop seizing relation to the loop seizing beak and thereby defining the point of loop seizure and for mounting said needle bar in said head for vibration in a plane laterally of the line of feed about an axis normal to the plane of lateral vibration and including the point of loop seizure, and means for imparting endwise reciprocation and lateral vibration to said needle bar.

2. In a sewing machine having a frame including a bed and a bracket arm terminating in a head overhanging said bed, feeding mechanism in said bed defining a line of feed, an arcuately moving loop taker mounted in said bed on a vertical axis and having a loop seizing beak, means for actuating said loop taker and thereby defining a path of movement of said loop seizing beak in a horizontal plane, a needle bar having a needle secured to the lower end thereof, means for mounting said needle bar in said head for endwise reciprocation thereof for passing said needle through a point adjacent to the path of movement of and in loop seizing relation to the loop seizing beak and thereby defining the point of loop seizure and for mounting said needle bar in said head for vibration in a plane laterally of the line of feed about an axis normal to the plane of lateral vibration and including the point of loop seizure, and means for imparting endwise reciprocation and lateral vibration to said needle bar.

3. In a sewing machine having a frame including a bed and a bracket arm terminating in a head overhanging said bed, feeding mechanism in said bed defining a line of feed, a loop taker mounted in said bed and having a loop seizing beak, means for actuating said loop taker and thereby defining a path of movement of said loop seizing beak, a needle bar having a needle secured to the lower end thereof, means for supporting said needle bar in said head for endwise reciprocation of said needle through a point adjacent to the path of movement of the loop seizing beak and comprising the point of loop seizure and for vibration in a plane laterally of the line of feed about an axis coinciding with the point of loop seizure, said means comprising a bracket, a bearing in said bracket for supporting said needle bar for endwise reciprocation, and means including cooperating bearing balls and ball tracks for supporting said bracket in said head for movement in a plane laterally of the line of feed and about an axis coinciding with the point of loop seizure, means for imparting lateral vibration to said bracket, and means for imparting endwise reciprocation to said needle bar.

4. In a sewing machine having a frame including a bed and a bracket arm terminating in a head overhanging said bed, feeding mechanism in said bed defining a line of feed, a loop taker mounted in said bed and having a loop seizing beak, means for actuating said loop taker and thereby defining a path of movement of said loop seizing beak and a point of loop seizure adjacent to said path of movement, a bracket, means for supporting said bracket in said head for vibration and in a plane transversely of the line of feed and about an axis normal to the plane of lateral vibration and including the point of loop seizure, means for imparting lateral vibration to said bracket, a needle bar mounted in said bracket for endwise reciprocation on an axis radially of the point of loop seizure and having a needle secured to the lower end thereof, and means for imparting endwise reciprocation to said needle bar comprising a collar on the upper end of said needle bar, a connecting link pivotally connected at its upper end to said collar and extending generally longitudinally parallel to said needle bar, and a drive link connected to the lower end of said connecting link.

5. In a sewing machine having a frame including a bed and a bracket arm terminating in a head overhanging said bed, feeding mechanism in said bed defining a line of feed, a loop taker mounted in said bed and having a loop seizing beak, means for actuating said loop taker and thereby defining a path of movement of said loop seizing beak and a point of loop seizure adjacent to said path of movement, a bracket, means for supporting said bracket in said head for vibration about an axis coinciding with the point of loop seizure and in a plane transversely of the line of feed comprising opposed arcuate ball tracks integral with said bracket and formed on an arc about the point of loop seizure, means carried by said frame arranged between said ball tracks and having arcuate grooved edges congruent with and opposed to said ball tracks, and bearing balls seated in said ball tracks and the opposed grooves, means for imparting lateral vibration to said bracket, a needle bar mounted in said bracket for endwise reciprocation on an axis radially of the point of loop seizure and having a needle secured to the lower end thereof, and means for imparting endwise reciprocation to said needle bar.

6. In a sewing machine having a frame including a bed and a bracket arm terminating in a head overhanging said bed, feeding mechanism in said bed defining a line of feed, a loop taker mounted in said bed and having a loop seizing beak, means for actuating said loop taker and thereby defining a path of movement of said loop seizing beak and a point of loop seizure adjacent to said path of movement, a bracket, means for supporting said bracket in said head for vibration about an axis coinciding with the point of loop seizure and in a plane transversely of the line of feed comprising opposed arcuate ball tracks integral with said bracket and formed on an arc about the point of loop seizure, a pair of opposed plates carried

by said frame for relative movement toward and away from each other, spring means for biasing said plate together, said plates being arranged between said ball tracks and having arcuate bevelled adjacent edges defining grooves congruent with and opposed to said ball tracks, and bearing balls seated in said ball tracks and opposed grooves, means for imparting lateral vibration to said bracket, a needle bar mounted in said bracket for endwise reciprocation on an axis radially of the point of loop seizure and having a needle secured to the lower end thereof, and means for imparting endwise reciprocation to said needle bar.

7. In a sewing machine having a frame including a bed and a bracket arm terminating in a head overhanging said bed, feeding mechanism in said bed defining a line of feed, a loop taker mounted in said bed and having a loop seizing beak, means for actuating said loop taker and thereby defining a path of movement of said loop seizing beak and a point of loop seizure adjacent to said path of movement, a bracket, means for supporting said bracket in said head for vibration in a plane transversely of the line of feed and about an axis normal to the plane of lateral vibration and including the point of loop seizure and, a lever pivotally mounted at one end in said head, means for operatively connecting the opposite end of said lever to said bracket, a pivot block pivotally mounted in said head and having a guide way, a slide block carried by said first lever for adjustment longitudinally thereof and seated in said guideway, a rotary pattern cam journaled in said bracket arm, and a cam follower on said pivot block and cooperating with said pattern cam to impart oscillation to said pivot block and thereby to said lever and said bracket upon rotation of said pattern cam, a needle bar mounted in said bracket for endwise reciprocation on an axis radially of the point of loop seizure and having a needle secured to the lower end thereof, and means for imparting endwise reciprocation to said needle bar.

8. In a sewing machine having a frame including a bed and a bracket arm terminating in a head overhanging said bed, feeding mechanism in said bed defining a line of feed, a loop taker mounted in said bed and having a loop seizing beak, means for actuating said loop taker and thereby defining a path of movement of said loop seizing beak and a point of loop seizure adjacent to said path of movement, a bracket, means for supporting said bracket in said head for vibration about an axis coinciding with the point of loop seizure and a plane transversely of the line of feed, a lever pivotally mounted at one end in said head, means for operatively connecting the opposite end of said lever to said bracket, a pivot block pivotally mounted in said head and having a guideway, said lever having an elongated slot extending longitudinally thereof, a stud extending through said slot and having a head at one end and a slide block at the other end, said slide block being seated in said guideway, a spring disposed between said lever and the head of said stud for frictionally maintaining said stud in adjusted position longitudinally of said lever, a rotary pattern cam journaled in said bracket arm, and a cam follower on said pivot block and cooperating with said pattern cam to impart oscillation to said pivot block and thereby to said lever and said bracket upon rotation of said pattern cam, a needle bar mounted in said bracket for endwise reciprocation on an axis radially of the point of loop seizure and having a needle secured to the lower end thereof, and means for imparting endwise reciprocation to said needle bar.

9. In a sewing machine having a frame including a bed and a bracket arm terminating in a head overhanging

said bed, feeding mechanism in said bed defining a line of feed, a loop taker mounted in said bed and having a loop seizing beak, means for actuating said loop taker and thereby defining a path of movement of said loop seizing beak and a point of loop seizure adjacent to said path of movement, a bracket, means for supporting said bracket in said head for vibration about an axis coinciding with the point of loop seizure and in a plane transversely of the line of feed, a first lever pivotally mounted at one end in said head, means for connecting the opposite end of said first lever to said bracket, a second lever pivotally mounted in said head on an axis coinciding with the pivot axis of said first lever, a pivot block pivotally mounted on said second lever and having a guideway, a slide block carried by said first lever for adjustment longitudinally thereof and seated in said guideway, a rotary pattern cam journaled in said bracket arm, and a cam follower on said pivot block and cooperating with said pattern cam to impart oscillation to said pivot block and thereby to said first lever and said bracket upon rotation of said pattern cam, a needle bar mounted in said bracket for endwise reciprocation on an axis radially of the point of loop seizure and having a needle secured to the lower end thereof, and means for imparting endwise reciprocation to said needle bar.

10. In a sewing machine having a frame including a bed and a bracket arm terminating in a head overhanging said bed, feeding mechanism in said bed defining a line of feed, a loop taker mounted in said bed and having a loop seizing beak, means for actuating said loop taker and thereby defining a path of movement of said loop seizing beak and a point of loop seizure adjacent to said path of movement, a bracket, means for supporting said bracket in said head for vibration about an axis coinciding with the point of loop seizure and in a plane transversely of the line of feed, a first lever pivotally mounted at one end in said head, means for connecting the opposite end of said first lever to said bracket, a second lever pivotally mounted in said head on an axis coinciding with the pivot axis of said first lever, a pivot block pivotally mounted on said second lever and having a guideway, means for manually shifting said second lever about the pivot axis thereof for adjusting the pivot axis of said pivot block and a resiliently biased element carried by said head and cooperating with depressions in the surface of said second lever for releasably securing said second lever in adjusted position, a slide block carried by said first lever for adjustment longitudinally thereof and seated in said guideway, a rotary pattern cam journaled in said bracket arm, and having a cam follower on said pivot block and cooperating with said pattern cam to impart oscillation to said pivot block and thereby to said first lever and said bracket upon rotation of said pattern cam, a needle bar mounted in said bracket for endwise reciprocation on an axis radially of the point of loop seizure and having a needle secured to the lower end thereof, and means for imparting endwise reciprocation to said needle bar.

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