No. 875,625. PATENTED DEC. 31, 1907.

W. N. PARKES.

EMBROIDERY OR ORNAMENTAL STITCH SEWING MACHINE.

APPLICATION FILED NOV. 29, 1905.

6 SHEETS—SHEET 1.

Fig. 1.

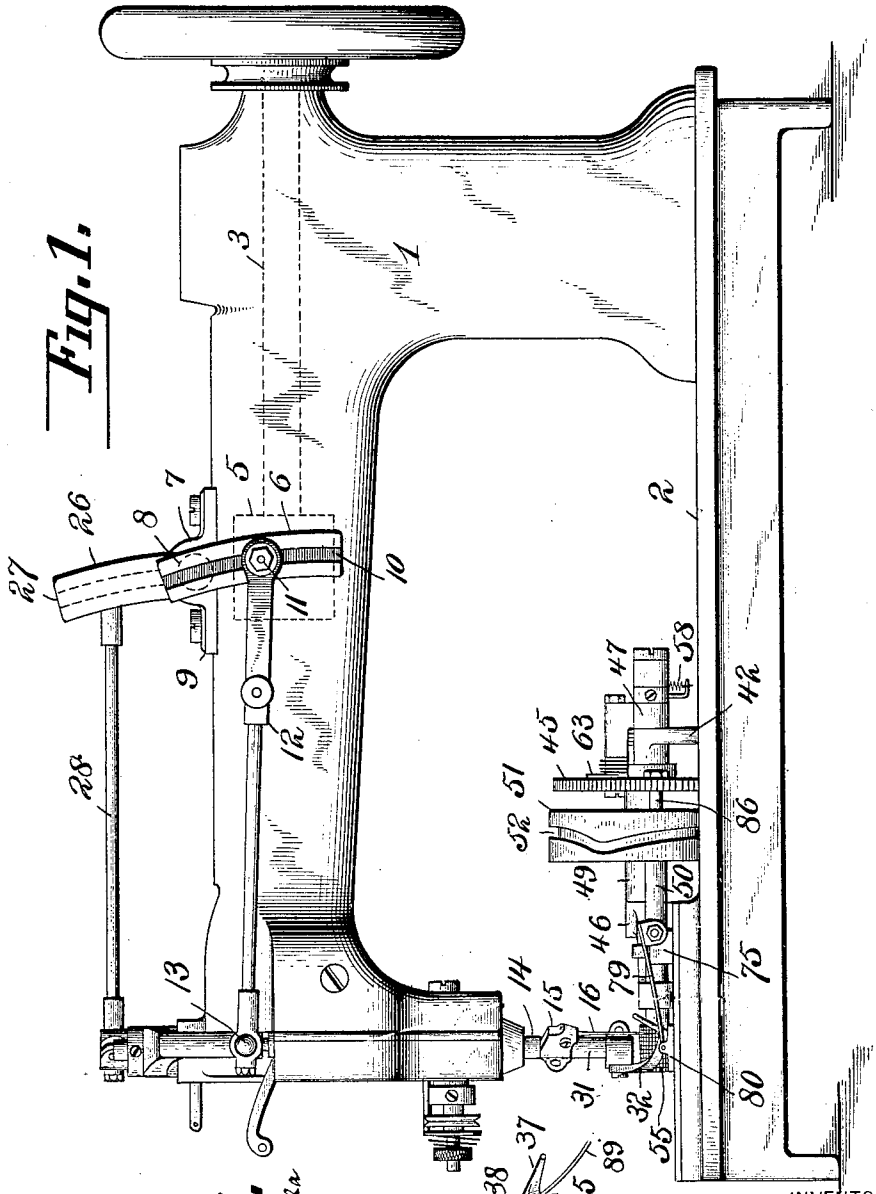
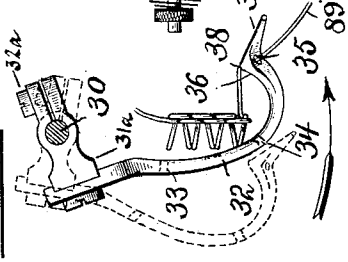


Fig. 8.



WITNESSES:

J. B. McGirr.

W. W. Ketchum

INVENTOR

William N. Parkes

No. 875,625. PATENTED DEC. 31, 1907.

W. N. PARKES.

EMBROIDERY OR ORNAMENTAL STITCH SEWING MACHINE.

APPLICATION FILED NOV. 29, 1905.

6 SHEETS—SHEET 2.

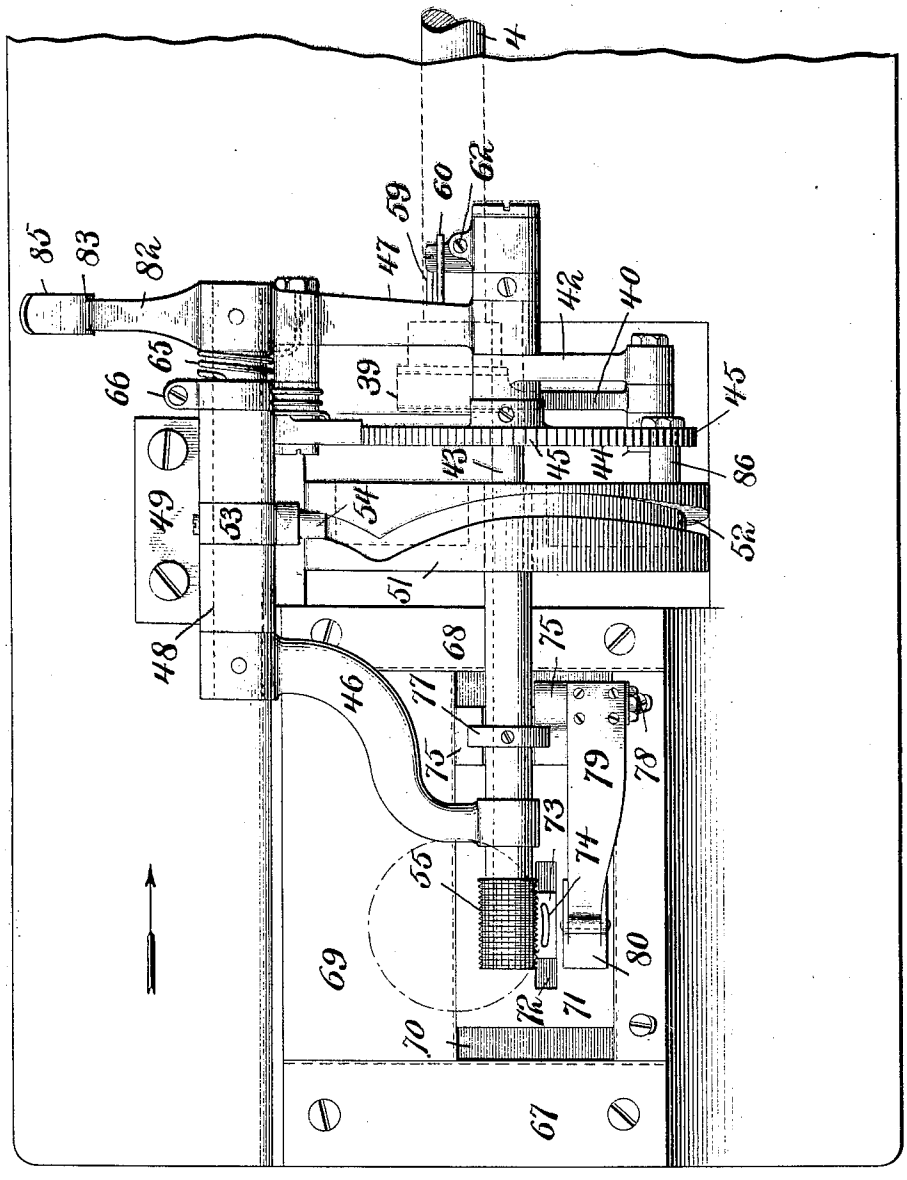


Fig. 2.

WITNESSES:

J. B. McGirr.

W. W. Ketchum

INVENTOR

William N. Parkes

No. 875,625. PATENTED DEC. 31, 1907.

W. N. PARKES.

EMBROIDERY OR ORNAMENTAL STITCH SEWING MACHINE.

APPLICATION FILED NOV. 29, 1905.

6 SHEETS—SHEET 3.

Fig. 3.

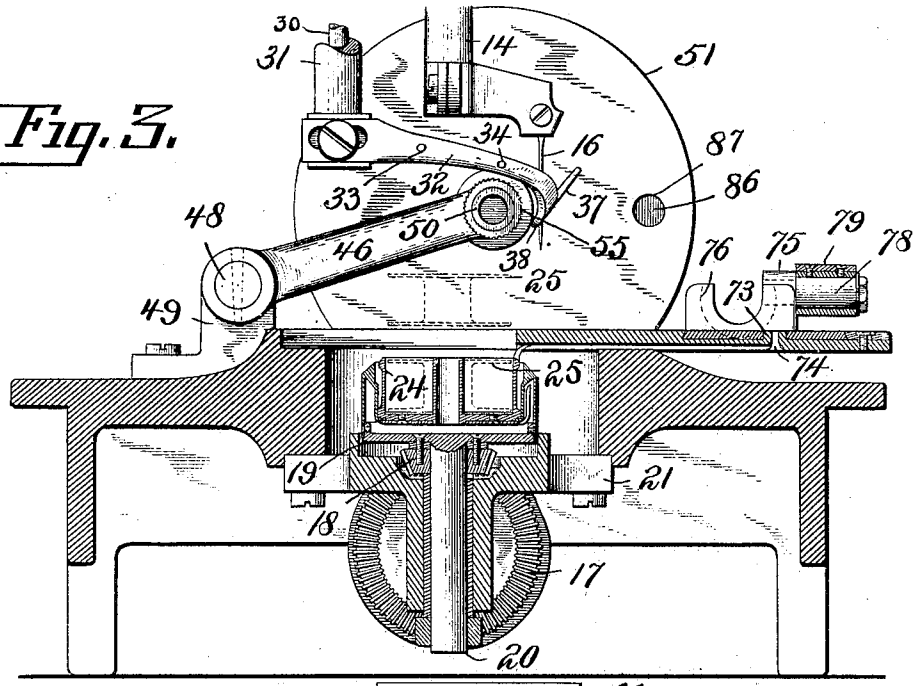
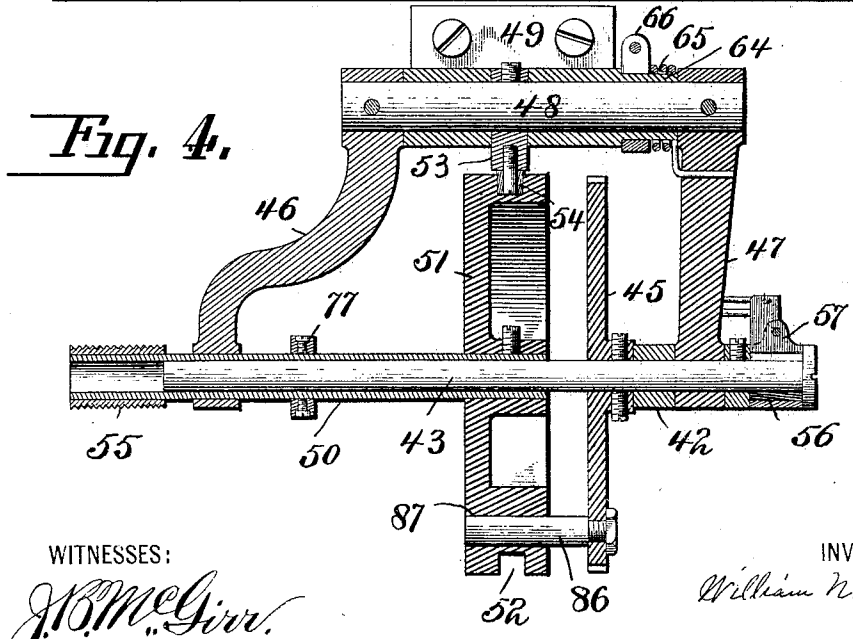


Fig. 4.



WITNESSES:

J. B. McGirr.

W. W. Ketchum

INVENTOR

William N. Parkes.

No. 875,625. PATENTED DEC. 31, 1907.

W. N. PARKES.

EMBROIDERY OR ORNAMENTAL STITCH SEWING MACHINE.

APPLICATION FILED NOV. 29, 1905.

6 SHEETS—SHEET 4.

Fig. 5.

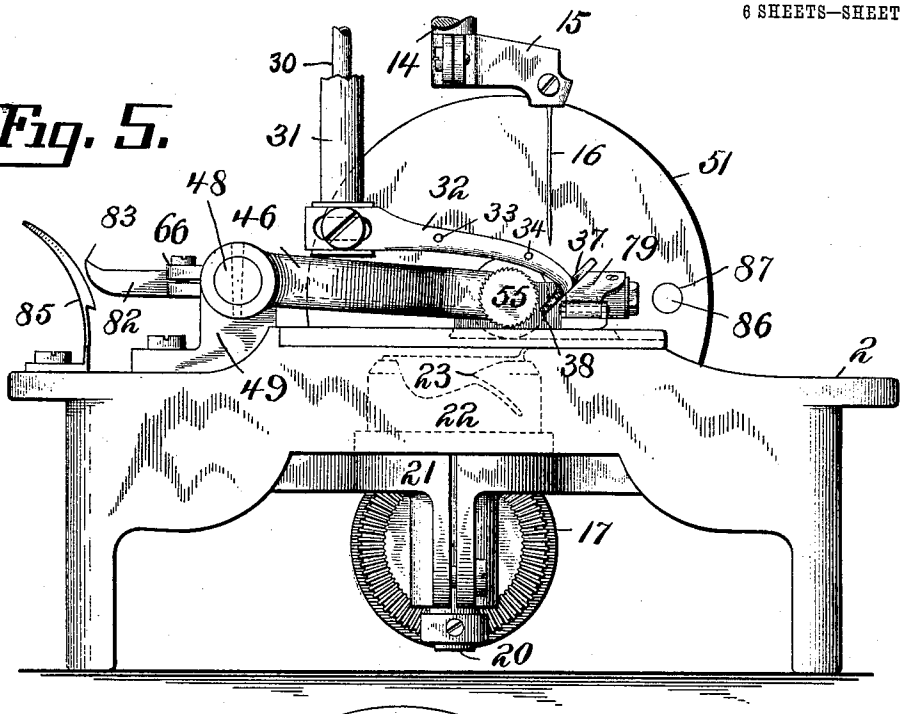
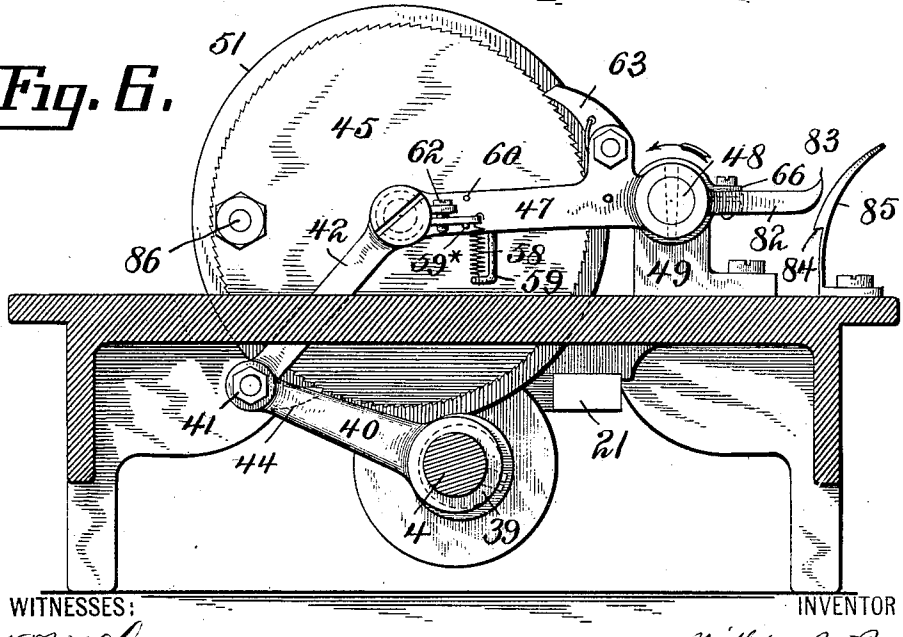


Fig. 6.



WITNESSES:

J. B. McGirr.

W. W. Ketchum

INVENTOR

William N. Parkes.

No. 875,625. PATENTED DEC. 31, 1907.

W. N. PARKES.

EMBROIDERY OR ORNAMENTAL STITCH SEWING MACHINE.

APPLICATION FILED NOV. 29, 1905.

6 SHEETS—SHEET 5.

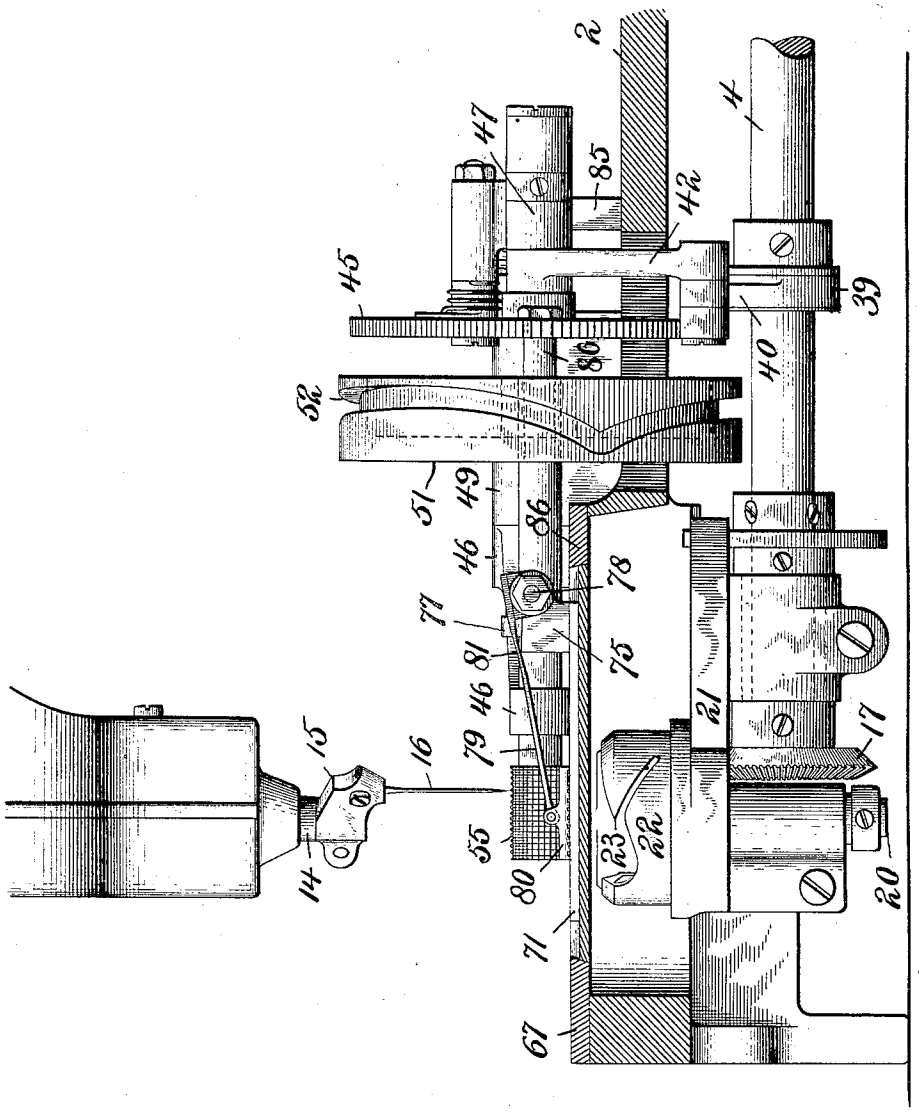


Fig. 7.

WITNESSES:

J. B. McGirr.

Wm. N. Ketchum

INVENTOR

William N. Parkes,

No. 875,625. PATENTED DEC. 31, 1907.

W. N. PARKES.

EMBROIDERY OR ORNAMENTAL STITCH SEWING MACHINE.

APPLICATION FILED NOV. 29, 1905.

6 SHEETS—SHEET 6.

Fig. 9.

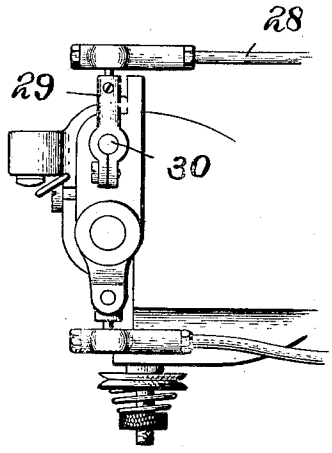


Fig. 10.

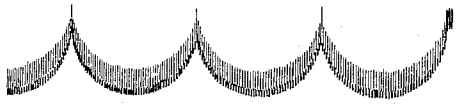


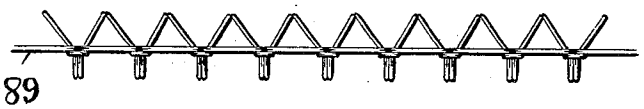
Fig. 11.



Fig. 12.



Fig. 13.



WITNESSES:

J. B. McGirr.

W. W. Ketchum

INVENTOR

William N. Parkes.

UNITED STATES PATENT OFFICE.

WILLIAM N. PARKES, OF BROOKLYN, NEW YORK.

EMBROIDERY OR ORNAMENTAL-STITCH SEWING-MACHINE.

No. 875,625. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed November 29, 1905. Serial No. 289,646.

To all whom it may concern:

Be it known that I, WILLIAM N. PARKES, a citizen of the United States, residing in Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Embroidery or Ornamental-Stitch Sewing-Machines, of which the following is a description.

This invention relates to sewing machines and belongs to the class known as embroidery or ornamental stitch sewing machines.

In sewing machines the thread is anchored in the work at the point where the needle previously penetrated the same, and a stitch is said to have been made at that point, then the work is moved after which the thread is again anchored in the work and another stitch is said to have been made. On the side of the work that the needle enters, the needle thread runs from one to another of the said stitches.

In this application that portion of the needle thread that runs from one to another of the stitches will be called a link of needle thread, and the stitches on the needle side of the work will be said to be connected by links of needle thread. On the looper side of the work stitches made by a lock stitch machine are connected by links of bobbin or locking thread. If a single chain stitch machine is used the stitches are connected on the looper side of the work by loops of the needle thread, or if a double chain stitch machine is used they are connected by loops of needle and looper threads combined. But in either one of these machines the stitches on the needle side of the work are connected by single links of needle thread.

When the work is moved in a straight line, and the needle reciprocates vertically only the thread on the surface of the work runs substantially in a straight line, but when the needle is moved laterally then of course the thread on the surface of the work runs laterally from one to another of the lateral points where the thread is anchored in the work. When the work is moved forward very slowly and the needle is moved laterally, the links of needle thread and of bobbin thread running from one to another of the stitches lie contiguous to each other so that the fabric or work is completely covered along a path that is the width of the extent that the needle is moved laterally. The stitches are deposited in the work in this manner primarily for the purpose of embellishing or ornamenting the fabric, and this work is therefore called embroidery, and when the work is moved laterally, or the working position of the needle is changed laterally so that the path covered by the links of needle thread runs in scallops the product is called embroidered scallops or festoons. In making embroidery of this kind it is of course evident, if only one needle is used, that there are two rows of stitches running along the edge of the path covered by the links of needle thread, and these links run laterally and consecutively from one to another of these edge stitches. It is thus clear that the embroidered path is composed of lateral links of thread that are anchored in the fabric at the edge of said path. When this kind of embroidery is used for edge work the material is cut away close to one edge of the path of the embroidery after the work has been done, or the material is cut to the path that it is desired to embroider. In either case the stitches that lie outside or at the edge of the material are deprived of their anchorage in the material. By reason of this the stitches shift at the edge of the material, when the article is used, and the edge is thereby exposed in places and the material frays out. An edge finished in this manner also has an unfinished appearance, and does not look like hand work because there is no purl along its edge.

Referring now to the object of my invention it is noted that the main object of the same is to provide improved means for making embroidered scallops or festoons and to combine with said means a device for making a purl along the edge of said scallop to hold the stitches in place, and to give the scallop a hand finished appearance.

The invention consists mainly of means for vibrating laterally a reciprocating needle, means for progressively moving the work forward and laterally so as to dispose the stitches to make embroidered designs or scallops, and means for looping an auxiliary thread around links of the needle thread along the extreme edge of said design.

In some sewing machines of this character to which my invention is applied, the needle is reciprocated vertically and vibrated laterally, and in others it is moved progressively or step by step laterally. The term "vibrated laterally" used in this specification means a to and fro, or back and forth movement, in contradistinction to a progressive or step by step lateral movement.

Referring now to the drawings: Figure 1 is a front elevation of a machine embodying my invention. Fig. 2 is an enlarged top plan view of the work moving mechanism, and the front end of the base of the arm of the machine. Fig. 3 is an end view of the mechanism shown in Fig. 2 (looking in the direction of the arrow in said figure), the mechism being shown displaced to permit of the insertion or removal of the bobbin, and the looper mechanism being in section to disclose the construction of the same. Fig. 4 is a sectional view of parts of the work moving mechanism disclosing the construction of the same. Fig. 5 is an end view of the mechanism shown in Fig. 2 with the parts in their operative position, and Fig. 6 is an end view of the same looking in an opposite direction to that indicated by the arrow in said figure. The base of the arm of the machine is shown in section in this Fig. 6, to expose the manner in which the ratchet wheel that operates the work moving mechanism is driven. Fig. 7 is a front view of the work moving mechanism, the base of the arm of the machine being shown in section to expose the looper mechanism, and part of the work moving mechanism. Fig. 8 is a top plan view of the auxiliary thread carrying finger, and Fig. 9 is a detail in connection with the operating mechanism for this finger. Fig. 10 illustrates an embroidered design stitched on the machine, and Figs. 11 and 12 are enlarged diagrammatic views showing the intertwining of the threads at the edge of the design. Fig. 13 is a diagrammatic view showing the auxiliary thread looped around links of the needle thread about midway of the lateral stitches.

In the drawings, 1 indicates the arm, 2 the base, 3 the driving shaft, and 4 the lower shaft of the machine. On the driving shaft 3, is secured an ordinary switch cam 5 which in a usual manner oscillates a segment lever 6 that is pivoted at 7 to the forward end of a short shaft 8. The said shaft is suitably journaled in a bracket 9 that is secured to the top of the arm of the machine. In the segment lever 6, is formed a way 10 which extends over the pivot of the lever, and in the said way is adjustably secured the end 11 of a two part connection 12. The forward end of said two part connection is connected at 13 to the means which oscillate a reciprocating needle bar 14 that is suitably adapted to be oscillated in bearings in the forward end of the arm of the machine. To the lower end of the needle-bar is secured a needle-holder 15 which carries a needle 16, (Fig. 5.) This needle as is seen in said Fig. 5 is carried eccentrically with respect to the axis of the needle-bar, and therefore when the bar is oscillated, the needle is moved laterally. The means which adapt this reciprocating needle-bar to be oscillated, are fully shown and described in my copending application Serial No. 93,037, filed February 7, 1902. It will now be understood that when the machine is operated, the lever 6 is oscillated, and from this movement the needle is moved laterally, and the shaft 8 is oscillated.

To the forward end of the shaft 4 is attached a gear wheel 17 that is in engagement with a gear 18, the latter being secured to the under side of a looper 19, as shown in Fig. 3. On the under side of the looper carrier, is formed a shaft 20 that is journaled in a suitable bracket 21, which latter is secured to the under side of the base of the head of the machine. A looper 22 having a beak 23 is carried by the looper carrier 19, and in the said looper is suitably located a bobbin case 24 that carries a bobbin 25. The axis of the needle-bar 14 is coincident with the axis of the looper 22, and the needle 16 is a sufficient distance from the axis of the needle-bar to bring it just outside of the periphery of the looper. It will now be understood that the needle moves laterally in a path that is concentric with the path of the beak 23 of the looper, and that consequently, there is no lateral change between the needle and the looper because of the lateral movement of the needle.

The looper, used in my present machine, is constructed as in my copending application Serial No. 277,774, filed September 9, 1905, and the auxiliary hook for assisting in the passing of the loop of needle thread around the bobbin, is also shown in said application. In practice in this machine, I use the bobbin controller shown and described in my copending application Serial No. 154,457, filed April 27, 1903. The looper in my present machine, revolves twice to each reciprocation of the needle, as in my said copending applications.

The stitch forming mechanism shown herein, is preferred for use in combination with my invention, but it is to be understood that it is not essential, as the invention may be used in connection with various kinds of stitch forming mechanisms. The mechanism which comprises my invention and which is adapted for use in combination with this stitch forming mechanism, will now be described. To the rear end of the shaft 8, is secured an arm 26 in the face of which is formed a way 27, as indicated in dotted lines in Fig. 1. This way runs across the axis of the shaft 8 same as the way 10 in the segment lever 6. In the way 27, is adjustably secured, by means not shown, one end of a connecting rod 28, the forward end of which is connected to an arm 29 that is clamped to the upper end of a rod 30. The rod 30 is journaled in a presser-bar 31, and the latter is mounted in suitable bearings in the end of the arm of the machine, and is depressed by a usual presser-bar spring, not shown. To

the lower end of the rod 30, is secured as shown in Fig. 8, a thread carrying finger or arm 32, in which are thread guiding holes 33 and 34, and a thread delivery eye 35. On the finger, is formed inclined surfaces 36 and 37, which meet and form an apex 38 through which the delivery eye 35 passes. The rod 30 extends a sufficient extent below the presser bar 31, to permit the finger carrying base 31^a to be clamped to the same by a screw 32^a in a usual manner as is shown in Fig. 8. The finger 32 is adjustably secured to said base in a usual manner, by means of a screw which passes through a slot in the base of the finger as shown in Figs. 3 and 5. From the said Figs. 3 and 5, and said Fig. 8, it will be clearly seen that the finger carrying base 31^a is clamped on the lower end of the rod 30 and abuts the lower end of the presser-bar so as to prevent upward movement of said rod 30. And by referring to Fig. 9, it will be seen that the arm 29 is secured to the top end of the rod 30, and this arm abuts in a usual manner the top end of the presser-bar 31, and thereby prevents longitudinal movement of the said rod.

The auxiliary thread carrying device 32 is called in this specification, and in the claims an arm, and a finger, but this device loops an auxiliary thread around the links of needle thread, and it is therefore to be understood that the term arm or finger comprehends any device that will perform this function.

It will now be understood, that when the machine is operated, the finger 32 will be moved laterally in the same direction in which the needle moves laterally, and in unison with said lateral movements of the needle. The incline parts 36 and 37 of the finger 32 serve as a means for displacing the needle thread as the apex 38 of the finger crosses the path of the same, it being understood that the said apex extends a sufficient extent back of the needle to draw the auxiliary thread 89 back far enough for the needle to descend in front of the same as will be understood by referring to Fig. 8.

The means provided for moving the work, will now be described.

On the lower shaft 4 of the machine, is secured an eccentric 39 on which is suitably journaled one end of a connection 40, the other end of said connection being connected at 41 to the outer end of a pawl lever 42. The pawl lever is pivoted on a shaft 43, and this lever carries a pawl 44 that is in engagement with a ratchet wheel 45. The ratchet wheel is secured to the shaft 43, and said shaft is journaled in the ends of arms 46 and 47, which latter are secured to a shaft 48. The shaft 48 is journaled in an upwardly extending part of a bracket 49 that is secured to the base of the machine, as best shown in Fig. 4. On the shaft 43, is journaled a sleeve 50, (Fig. 4,) on one end of which is secured a cam 51. In the periphery of the cam, is a cam groove 52. In a part 53, that is secured to the shaft 48, is secured a pin on which is located an anti-friction roller 54 that is in engagement with the cam groove 52. To the forward end of the sleeve 50 is secured a feed wheel 55 that is adapted to engage the work, and move the same forward.

On the rear end of the shaft 43, is located a suitable friction material 56, and on the friction material, is located a frictional clamp 57, to the outer end of which is secured one end of a spring 58, the other end of said spring being connected to a pin 59 that extends downwardly from the arm 47. A pin 59* serves as an abutment for the extending part of said friction clamp, and the spring 58 normally draws the clamp into engagement with said pin. A pin 60 serves as a means for limiting the forward movement of the clamp, and a screw 62 serves as a means for regulating the extent of the friction on the shaft.

In the operation of the ratchet wheel 45, the friction between the shaft 43, and the frictional clamping device, normally carries the clamping device forward against the action of the spring 58 until the tension of the spring is greater than the friction between the shaft and the clamping device. In practice, the parts are adjusted so that this point is reached when the extended end of the clamping device is intermediate of the abutting pin and limiting pin. Under the action of this friction device, the ratchet wheel is normally drawn by the spring 58 in an opposite direction to its forward movement into engagement with a stop pawl 63, and throwing ahead of the ratchet wheel, and the parts operated by it is avoided, and an accurate feed from the movement of the ratchet wheel is assured.

On the bracket 49 is a reduced portion, as at 64, Fig. 4, and on said reduced portion is located a spring 65, one end of which engages the arm 47 and the other end a part 66 that is circularly adjustable on the reduced portion 64 of the bracket 49. This spring normally turns the shaft 48 in the direction indicated by the arrow in Fig. 6.

To the base of the machine, is secured guide pieces 67 and 68 between which is adapted to slide a plate 69. In the plate 69, is formed a suitable way 70 in which is adapted to slide an auxiliary plate 71, and through the latter is an elongated opening 72. From the bottom of the way 70, extends upwardly a boss 73, and through said boss passes a needle slot 74. The top of the boss is flush with the top of the auxiliary plate. To the auxiliary plate 71, is secured a bracket 75 in which a groove 76 is formed. A ring 77 is secured to the sleeve 50, (see Fig. 4), and the said ring when the machine is in operation, is located in the groove 76 of the bracket 75, as best seen in Figs. 2 and 5.

In the bracket 75, is secured a stud 78 to which is secured one end of a drag foot carrier 79, and to the outer end of the drag foot carrier is pivoted a drag foot 80 which is adapted to engage the work, and press the same against the auxiliary plate 71. The drag foot carrier is reduced as indicated at 81, (Fig. 7), so that it is flexible enough to permit of the drag foot being lifted to place the work under the same, and the end that is located on the stud 78 may be adjusted circularly on the same so as to increase or decrease the pressure of the drag foot on the work. The foot is pivoted to the end of the drag foot carrier as best shown in Fig. 5, so it will be understood that the foot is adapted to conform to the level of the work. The function of the drag foot is to put a friction on the work so as to hold the same taut across the needle plate, to take the strain off the stitches and thereby prevent the work from drawing or puckering.

The arm 47 has a rearwardly extending portion 82, the part 83 of which is adapted to engage a catch 84 formed on a spring 85, which latter is attached to the base of the machine as best seen in Fig. 6. In the ratchet wheel 45, is secured a stud 86, the end of which is located in a hole 87 that passes through the cam 51 as best shown in Fig. 4.

In the operation of the machine, the ratchet wheel 45 is revolved by the operating pawl 44, and by reason of the connection between the ratchet wheel and the cam 51, the latter is revolved in unison with the ratchet wheel. As the cam revolves, it reciprocates laterally by reason of the engagement between the cam groove 52, and the roller 54, it being understood that the latter cannot move laterally. As the cam rotates, and moves laterally the sleeve 50 is rotated and moved laterally, and this movement is transmitted to the feed wheel 55, and it is rotated and moved laterally, and through this movement of the feed wheel, the work is moved forward and laterally. The cam groove 52 is suitably constructed to move the work laterally so as to produce, in combination with the laterally moving needle, the design illustrated in Fig. 10. The needle moves laterally back and forth a constant extent, but the said feed wheel moved progressively laterally so the stitches are deposited on the work as indicated in said Fig. 10.

It is obvious that the extent of the lateral movement of the needle may be varied, that the shape of the design may be varied by using different cams or otherwise, or that various other changes may be made in the mechanism without departing from the spirit of my invention. So it is to be understood that I do not wish to be confined to the particular form of my invention herein selected for the disclosure of the same.

In the operation of the stitch forming mechanism, the needle is moved laterally from the movement of the lever 6, and the finger 32 is moved laterally in the same direction in which the needle moves laterally. The end of the connection 28 is adjusted on the arm 26 so that the apex 28 of the finger moves a greater extent laterally than the needle, and the working position of the finger is adjusted so said apex moves a greater distance on one side of the zone of lateral movement of the needle than the other as shown in Fig. 8. This movement of the finger to one side of the zone of lateral movement of the needle, causes the finger to entwine the auxiliary thread along the outer edge of the embroidered design, as illustrated in Figs. 10 and 12.

In Fig. 12, the needle thread is indicated by the reference character 88, and the auxiliary thread by 89. The manner in which the embroidery threads are twisted around the auxiliary thread, as shown in Fig. 12, is brought about by having a slight tension on the auxiliary thread, and adjusting the action of the finger so it finishes its stroke in the direction of the arrow, (Fig. 8), just previous or at about the time the take-up sets the stitch.

In Fig. 11, the auxiliary thread 89 is shown loosely entwined around the needle thread, and separated so it may be clearly seen how this thread is twisted about the needle thread.

In Fig. 8, the looper thread is entwined around the needle thread and at the edge of the embroidery stitches, this effect being produced by having the tension on the auxiliary thread very light, and setting the embroidery stitch just previous to finishing the stroke of the finger.

The device for manipulating an auxiliary thread in combination with the lateral stitches, is valuable for purposes other than those which have been explained. For example, it may be effectively used in making ornamental stitches as is illustrated in Fig. 13. In the making of this ornamental stitch design, the thread carrying finger is moved an equal distance on each side of the zone of lateral movement of the needle, and the tension on the auxiliary thread is adjusted so as to draw the needle threads as indicated in said figure. It will thus be understood that a large number of different effects in the stitch may be made. It is also to be understood that this device may be used in buttonhole machines, and in other kinds of sewing machines.

Having now described a preferred form of my invention what I claim as new is:

1. In combination in a sewing machine, a vertically reciprocating and laterally vibrating needle, a feeding device that engages the work and moves it progressively forward relative to said feeding device, means for

moving the work progressively laterally to dispose the stitches to make an embroidered design, and means for looping an auxiliary thread around links of the needle thread.

2. In combination in a sewing machine, a vertically reciprocating and laterally vibrating needle, a device for moving the work progressively forward, means for moving the work progressively laterally to dispose the stitches to make an embroidered design, and means for looping an auxiliary thread consecutively around the links of the needle thread along the edge of said design.

3. In combination in a sewing machine, a vertically reciprocating and laterally vibrating needle, a device for moving the work progressively forward, means for moving the work progressively laterally to dispose the stitches to make an embroidered design, and means for looping an auxiliary thread around links of the needle thread including a thread carrying device that moves laterally in unison with the lateral movements of the needle.

4. In a sewing machine, a stitch forming mechanism comprising a reciprocating and laterally moving needle, a feed mechanism comprising a revolving feed wheel adapted to engage the work, means for reciprocating said feed wheel in a direction at right angles to the direction in which it revolves, an auxiliary thread carrying device and means for operating said auxiliary thread carrying device so that its thread is looped consecutively around the links of the needle thread

5. In a sewing machine, a stitch forming mechanism comprising a reciprocating and laterally moving needle, a needle plate adapted to reciprocate, a revolving feed wheel adapted to engage the work, and means operated separately from the stitch forming mechanism for reciprocating said needle plate and said feed wheel.

6. In a sewing machine, a stitch forming mechanism comprising a reciprocating and laterally moving needle, a needle plate adapted to reciprocate, a revolving feed wheel adapted to engage the work, and means operated separately from the stitch forming mechanism for reciprocating said needle plate and said feed wheel, comprising a revolving ratchet wheel.

7. A sewing machine, comprising a vertically reciprocating and laterally vibrating needle, a needle plate, a feeding device that is in direct engagement with the work, a drag foot, and means for simultaneously moving laterally said needle plate, said feeding device and said drag foot.

8. A sewing machine having a vertically reciprocating and laterally moving needle, a thread carrying finger comprising a thread delivery part, means for moving said finger laterally in the same direction in which the needle moves laterally so the thread delivery part crosses the path of the needle, and means adapting said finger to push the needle thread from its path as it crosses the path of the needle.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM N. PARKES.

Witnesses:
J. B. McGirr,
Wm. W. Ketchum.