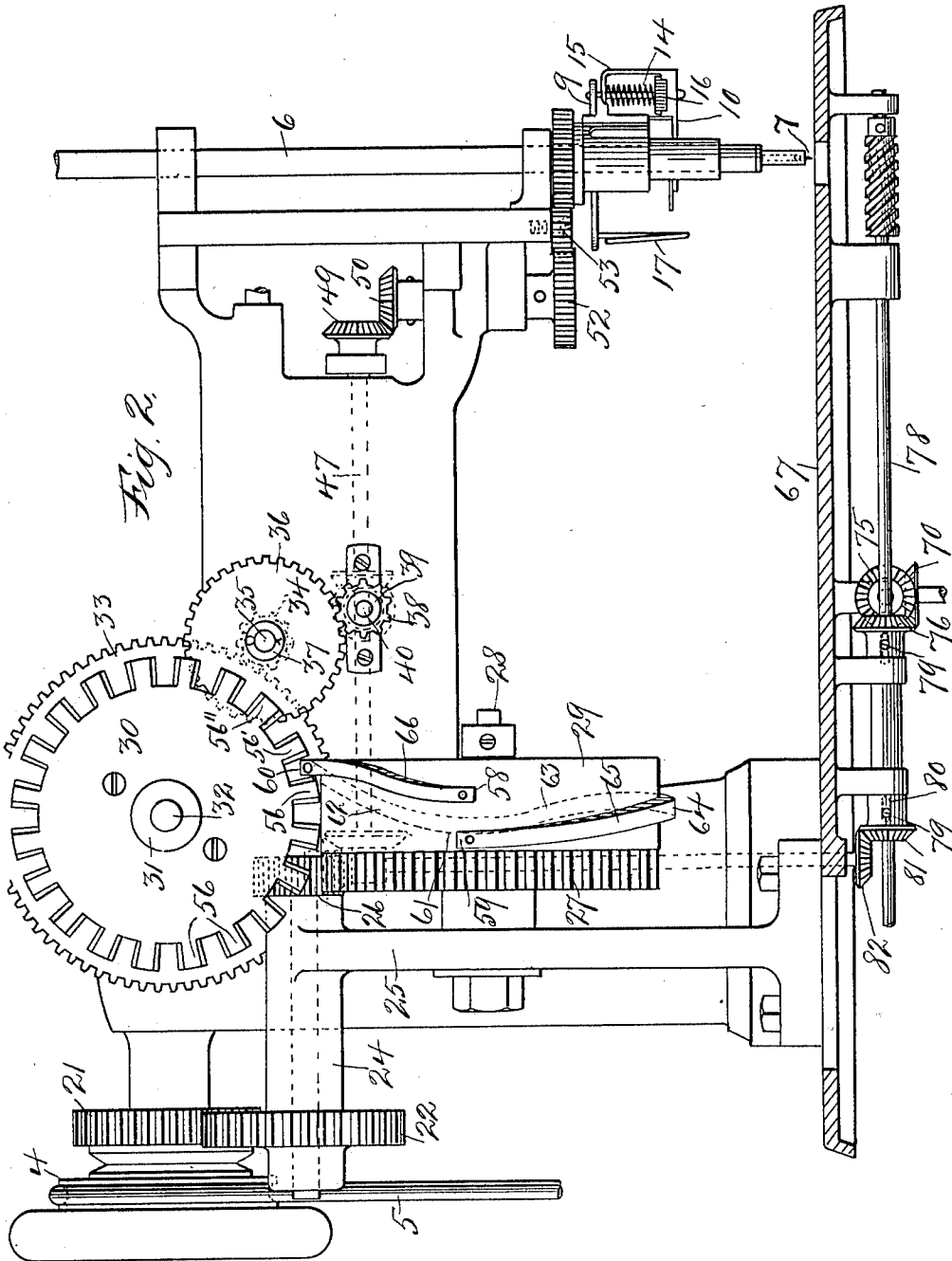


J. A. GROEBLI.
SEWING MACHINE.
APPLICATION FILED JULY 11, 1911.

1,066,490.

Patented July 8, 1913.

3 SHEETS-SHEET 2.



Witnesses:
Wm. J. Higgins
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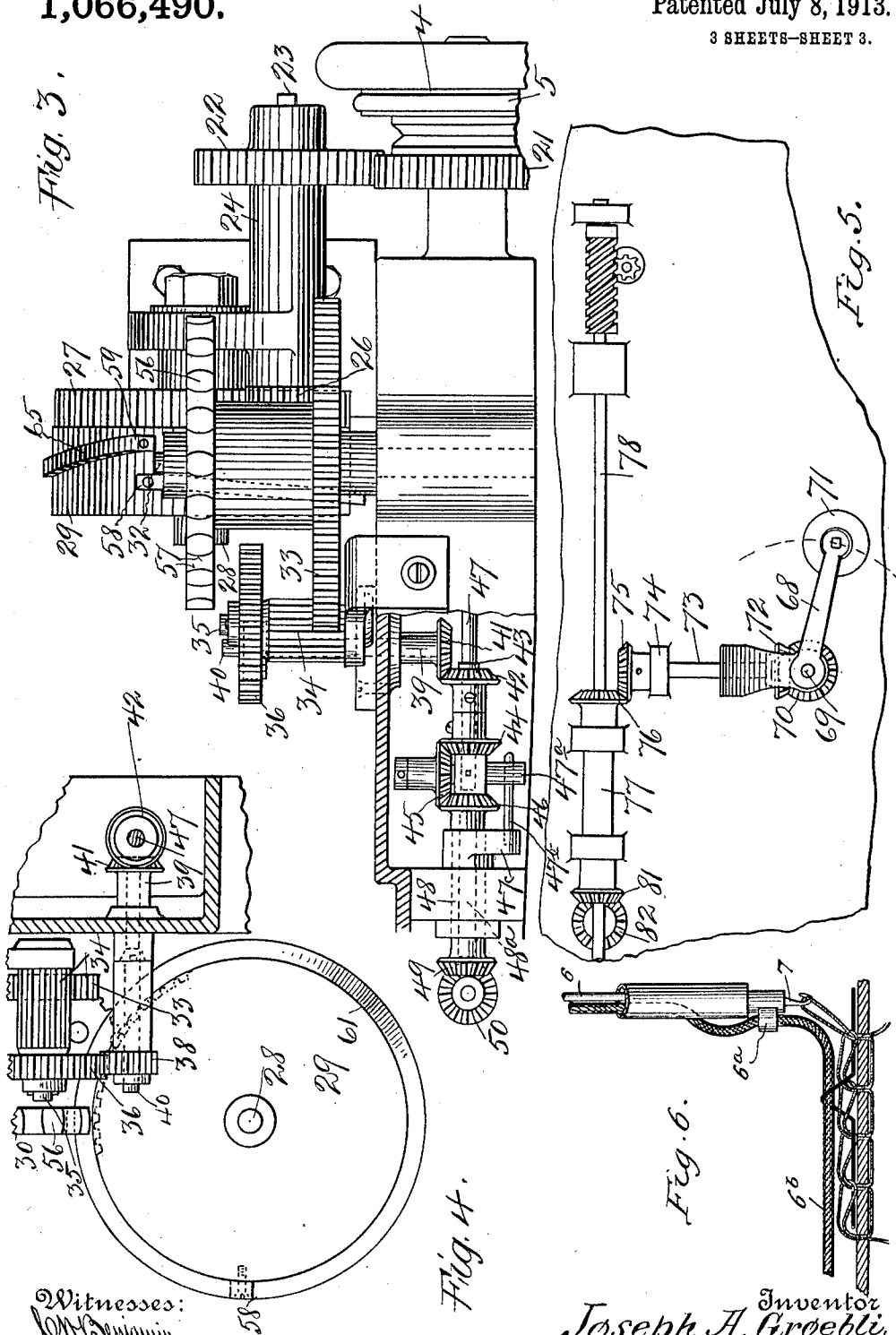
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By his Attorneys
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Witnesses:
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UNITED STATES PATENT OFFICE.

JOSEPH A. GROEBLI, OF NEW YORK, N. Y.

SEWING-MACHINE.

1,066,490.

Specification of Letters Patent.

Patented July 8, 1913.

Application filed July 11, 1911. Serial No. 638,013.

To all whom it may concern:

Be it known that I, JOSEPH A. GROEBLI, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to sewing machines and more particularly to a sewing machine for attaching decorations to fabrics.

In my application for U. S. Patent Serial No. 618,681 I have shown a decorated fabric, in which an attenuated decoration, such as a cord or the like, is attached to a base fabric by means of a line of stitching passing through the fabric, and a binding thread which passes under the stitches and around the decoration, to hold the decoration upon the fabric in a desirable and pleasing manner.

My present invention though adapted for other uses, is particularly advantageous for decorating fabric in accordance with the showing in my said pending application, and in a simple and inexpensive manner.

In applying decorative material to a fabric it is not always possible, as in the case of strings of beads, to pass a sewing thread through the decoration and fabric; while in certain other cases it prevents the obtaining of the desired artistic effect, to pass the stitching through the decorative material. To avoid this, machines have been made, which passed a line of stitching through the base fabric and at the same time wound a holding thread spirally around the decoration and under the stitching, so that the holding thread secured the decoration and the stitching secured the holding thread to the fabric, so that the stitching was concealed by the decoration. So far it has only been possible to wind the holding thread spirally around the decoration and under the stitching. The difficulty with that construction of the material however, is that the decorative material is not substantially held by the holding thread and the fabric is therefore limited in the uses to which it can be put; and again, the fabric when thus decorated has not the same pleasing appearance as when made by hand, in which latter case transverse loops of thread pass around the decoration and through the fabric. I have therefore devised a machine which will dispose the holding thread in the most desirable and advantageous manner so that

a superior product may be produced upon a machine. A product like that shown in my said application may be formed. Under the full embodiment of my invention the holding thread is passed in zig-zag formation back and forth under the sewing thread and between the latter and the fabric and at preferably regular intervals the holding thread is passed around the decorative material to form transverse loops for holding the decoration upon the fabric. I accomplish this in a very simple and effective manner and in a manner which permits the direction of the feeding the work to be controlled by hand, in order that the decoration may be applied to the fabric in straight or curved formation, as may be desired. I provide means for feeding the holding thread in relation to the stitching and the decoration, and by a novel cam movement impart an oscillating movement to the holding thread feed to pass the holding thread back and forth under the stitching and then entirely around the decoration to form a transverse loop.

In the drawings forming a part of this application, Figure 1, is an elevation of a sewing machine of well known construction with part of the frame open showing my invention, in the preferred form embodied therein, Fig. 2, is a similar view of the rear thereof, Fig. 3, is a plan view of a portion thereof. Fig. 4, is a sectional view taken on the line 4—4 of Fig. 3, looking in the direction of the arrows. Fig. 5, is an inverted plan view of the under side of the table, showing parts of the hand control for controlling the direction of feed. Fig. 6 is an enlarged elevation showing the needle shaft, needle, and the construction of the stitch.

In the preferred form of my invention I mount a thread holder for the holding thread, to oscillate and rotate around the needle shaft; and I produce the desired movements by means of a cam of peculiar formation which actuates a toothed member (gear) and the cam serves to oscillate the toothed member the desired number of times and to produce the movement whereby the thread feed is entirely revolved, by engaging successive projections upon the toothed member in predetermined order.

In the present case I have omitted showing some parts of the sewing machine which are of well known construction in order to

save complications, but it may be herestated that my invention may be applied to any form of machine which is adapted to stitch a fabric.

5 In the drawings I have shown a frame 1, of well known construction having a head 2. The usual shaft 3, for operating the needle shaft is shown disposed longitudinally in the head and one end of this shaft is provided with a drive pulley 4, to which the
10 operating force is carried by a belt 5. This shaft is shown broken off at the left end and the means for operating the needle shaft is omitted in order to simplify the present showing and because such elements are well known in the art. I have shown the needle shaft 6, arranged to reciprocate in the head 2, and it carries on its lower end a needle 7, as well as a guide 6^a for the decorative
15 cord 6^b. On the shaft 6, I have arranged a sleeve 8, which preferably carries the supply of holding thread and a guide for feeding the same in proper relation to the stitching and decorative material, and by imparting the necessary oscillations and rotations to this, the desired feed of the holding thread is accomplished. The sleeve 8 is provided with a lateral plate 9, and between this latter and a plate 10, is arranged a
20 spindle 11, for receiving and holding the spool 12, of holding thread so that the latter is moved with the sleeve. The plate 10 is adjustable, for the purpose of placing the desired tension upon the holding thread by increasing or decreasing the friction of the plates 9, 10, upon the ends of the spool 12. A spindle 13, is provided on the plate 9, which retains a spring 14, and the latter surrounds the spindle and lies between a
25 yoke 15, on the plate 10, and an adjusting nut 16, threaded upon the spindle 13. By means of the nut 16, the plate 10, may be moved to and from the plate 9, and the desired spring tension placed upon the spool 12. I provide on the plate 9, a downwardly extending U shaped guide 17, which serves to guide the thread 18, which leads from the spool 12, to the working point of the fabric.

30 I impart to the sleeve 8, oscillating movements, whereby the thread 18, will be led first to one side of the line of stitching formed upon the fabric by the regular sewing needle 7, passing at the same time under the stitching, and then to the opposite side, at the same time passing the thread 18, under the stitching. At certain intervals the thread guide 17, and the sleeve 8, rotate completely around the needle shaft and this
35 causes the holding thread 18, to be passed around the decorative material and the stitching, to form loops for the purpose of securing the decoration to the fabric.

The decorative material, whether it be a
65 cord, made of many small threads, or a pip-

ing, or a string of beads, is preferably fed through the tubular needle shaft 6, from whence it leaves at a point slightly behind the needle 7, in a manner well known in the art. By feeding the decorative material upon the fabric slightly behind the needle, that is, behind it in Fig. 1, the sewing thread will not be passed through the decoration, but will form stitches which will come under the same.

70 Upon the main shaft 3, of the machine I have provided a gear 21, which meshes with, and drives a gear 22, on a short shaft 23, journaled in a lateral hub 24, of the upright standard 25. On the other end of the shaft 23, I have provided a smaller gear 26, which meshes with and drives a larger gear 27, by which the operating force is carried to a shaft 28. Mounted on the shaft 28, and preferably against the gear 27, is a cam 29, of peculiar construction, which will be hereinafter described more in detail. The flange of this cam engages with the teeth of a gear 30, whose hub 31, is mounted upon a shaft 32, journaled in the frame of the machine. Upon the hub 31, of the gear 30, is provided another gear 33. The latter in turn meshes with, and drives a smaller gear 34, carried upon a shaft 35. The gear 36, upon the same hub 37, as the gear 34, imparts the movement to a smaller gear 38, whose hub 39, is mounted on a transverse shaft 40. Within the casing of the frame, I have provided a gear 41, on the hub 39, just referred to, and this gear miterers with a gear 42, on a sleeve 43, from which the movement is carried finally to the sleeve 8. While all the gears herein referred to may not be necessary in every machine, I find it convenient to reduce the movement and carry it to the rear of the machine, where the peculiar cam action is brought in and to then bring the converted movement through the frame to the longitudinal sleeve and shaft, multiplying the movement at the same time through the gears. Upon the sleeve 43, is fixed another gear 44, and this miterers with a gear 45, which is carried loosely upon a shaft 47^a, and the latter is secured at right angles upon a shaft 47, which connects with the hand control of the feed, and which passes through the sleeve 43. The gear 45, also miterers with a gear 46, secured to shaft 48^a, thereby forming a planetary-gearing of the gears 44, 45, and 46.

120 From the shaft 48^a, the motion is transmitted by a gear 49, mitering with a gear 50, the latter being mounted on a short shaft 51, and on the latter is a second gear 52, which meshes with an intermediate gear 53, secured by a bolt 54, to the head. The gear 53, also meshes with a gear 55, carried upon the sleeve 8, which carries the spool. It will thus be apparent that through the various gears I have taken the operating
130

power for the sleeve 8 from the main shaft 3, and through means which permits the operation of the sleeve 8 independent of the needle shaft, but in proper synchronism therewith. The revolving motion taken from the main shaft is transformed by the cam 29, and the gear 30, into the desired oscillatory and rotative motions required for the operation of the sleeve 8.

The gear 30, is here shown as having the teeth 56, the active faces 57, of which are preferably convex, as clearly appears in Fig. 3. The cam 29, is provided with a flange which engages between the teeth 56, of the gear 30, and the flange is not continuous but has ends 58, 59, separated from each other, transversely of the face of the cam. These ends 58, 59 preferably overlap on a transverse line as shown in Fig. 2, so that the gear 30, is at all times subject to the action of some part of the cam. In other words the flange is never entirely disengaged from the teeth of the gear 30. Regarding the cam 29, from the position shown in Fig. 2, it will be observed that the flange is so curved that at the point 60, it is on the right side of the cam, which is the point of engagement with the gear teeth 56, in the position shown in Fig. 2; at the point 61, the flange runs to the left side of the cam, the curve 62, from the point 60, to the point 61 being rather abrupt; from the point 61, the flange curves as shown in dotted lines, along the line 63, to the point 64, where it reaches a point near the middle of the cam transversely; and from there the flange curves again to the left at 65, until it terminates at the point 59. From the point 60 the flange curves at 66, toward the middle of the cam again and terminates in the end 58. The space between the ends 58, and 59, corresponds with the distance between the gear teeth 56.

If the machine is set into operation, the shaft 3, will operate through well known mechanism, to reciprocate the needle shaft. At the same time a revolving motion will be imparted through gears 21, 22, 26, and 27, to the cam 29. If the latter now revolves, toward the reader in Fig. 2, the following actions will result. In the position shown in this figure, the flange engages between teeth 56, and 56' of the gear 30, at the point 60, of the cam. If the cam revolves, counterclockwise, as viewed from the right hand in this figure, the curve 62, will produce a revolving action upon the gear 30, turning the latter clockwise, as viewed in Fig. 2, until the point 61, of the cam reaches the teeth 56, 56'. This is the extreme thrust of the cam, because the points 60, and 61, are separated the full width of the cam. The movement thus produced upon the gear 30 is imparted through the gears above described, and their shafts, and

finally reaches the spool carrying sleeve 8; and this motion is sufficient to revolve the latter and carry the spool 12, and thread guide 17 about one and a half rotations around the needle shaft. The result of this will be to cast a loop entirely around the decorative material, and around the sewing thread so that the latter, in forming the stitches upon the fabric, secures the holding thread 18, to the fabric. By making the curve 62, of the cam short enough this loop may be cast quickly, so that the needle will not have proceeded in another stitch while the loop is being cast. The loop therefore may be made to lie transversely around the decorative material as shown in my said pending application and resemble hand work. When the motion just described took place, the sleeve 8, made about one and a half revolutions so that the thread guide 17, has moved to the opposite side of the line of stitching as before.

The continuation of the rotation of the cam 29, in the same direction, will result in the curved part 63, of the flange, operating as before, between the teeth 56, 56', moving the gear 30, counterclockwise, or reverse to the movement just described, until the point 64, is reached; which will produce a movement in gear 30, of less extent than that caused by the curve, between points 60 and 61. This movement will cause the holding thread guide 17 to oscillate with the sleeve 8, sufficient to cross the thread 18, under the line of stitching produced by the needle, but will not carry the holding thread around the decorative material. The guide 17, will therefore lie on the opposite side of the line of stitching to what it previously did. In continuing its movement the cam 29, will still further act upon the gear 30. While the curve 65, of the flange from point 64, to the point 59, is passing between the teeth 56, 56' the gear 30 will again be moved clockwise sufficient to cause the guide 17, to again cross the holding thread under the path of the stitching and bring it to the opposite side. When the end 58, entered between teeth 56, and 56'', no immediate change was caused; but as the cam revolves and completes its revolution the tooth will have advanced from 58 to 59, that is in addition to its oscillations the gear will have advanced and another tooth will have engaged with 58, which tooth in the course of another revolution of the cam will be advanced by being shifted to 59. Each time the cam revolves, the end 58, takes in a notch of the gear 30, to one side of that from which the end 59, is leaving, so that the progressing action will take place at each revolution. The same action is caused by the cam 29, at each revolution, but the gear 30, is made to progress one notch at each revolution of the cam and thereby makes it possible to form

the loop around the decoration always in the same direction.

As stated above, I provide means for controlling the direction of feed by hand so that while imparting the above movements to the holding thread feed, the operator can independently and simultaneously cause the parts to move for changing the direction of feed, in order that the decoration may be formed in various curves on the fabric. On the underside of the table 67, I have provided a crank 68, which is revolved on its shaft 69, by an operating handle 71. The shaft 69, carries a gear 70, which miteres with a gear 72, on a short horizontal shaft 73, journaled in brackets 74, on the under side of the table. The other end of shaft 73, has a gear 75, which meshes with a gear 76, integral with a sleeve 77. The sleeve 77, surrounds the shaft 78, which is the shaft that operates the looper, and which is reciprocated to revolve the looper, and rotated to correspond with the direction of feed. The shaft 78, and the looper and its operation, are all well known and may be found in the well known Bonnaz machine. An example of the Bonnaz machine may be found in U. S. Patent to Cornely No. 148182. The sleeve 77, is feathered to the shaft 78, by means of pins 79, which travel in slots 80, so that the shaft 78, will be revolved by the sleeve 77, but the shaft may be freely reciprocated longitudinally in relation to the sleeve. On one end of the sleeve 77, is provided another gear 81, which meshes with a gear 82, on an upright shaft 83, and the latter has on its upper end a gear 84, which miteres with a gear 85 on the shaft 47. The latter, it will be remembered, carries the cross shaft 47^a, which has one gear of the planetary gearing thereon. It should be noted that the end of the shaft 47^a, engages a pin 47^b, which is secured to an arm 47^c, of the sleeve 48. The sleeve 48, and the gear on the end thereof is to turn the needle shaft, through mechanism not shown, and the gear corresponds with gear 12 of the Cornely Patent No. 262,742.

By turning the crank 68, the movement will be imparted through the gears 70, 72, shaft 73, and gears 75, 76, to the shaft 78, which operates the looper and controls its position. From the sleeve 77, through gears 81, 82, shaft 83, and gears 84, 85, the motion is carried to the shaft 47. Rotation of the shaft 47, in either direction, will cause the gear 45, on cross shaft 47^a, to be rotated and will also revolve the sleeve 48, through the pin 47^b, and arm 47^c, which cross shaft moves with the shaft 47. From the gear 45 the motion is carried to the gear 49, etc., to the thread guide 17, through the shaft 48^a, and the gears 49, 50, shaft 51, and gears 52, 53, and 55, the same as if the motion came from the cam. Since the movements from

the cam 29 come to the shaft 48^a, through the planetary gears 44, 45, and 46, the movement of the hand feed can take place simultaneously with the oscillations and rotations caused by the cam, and without interference one with the other. In this manner the position of the guiding finger 17, is controlled for the purpose of controlling the direction of feed of the work.

From the above it will be apparent that I provide means for oscillating the holding thread back and forth before the stitching and periodically revolving the same around the decorative material, and under the stitching to produce the desired results, and in the preferred embodiment of my invention the loops are all cast by the holding thread in the same direction around the decoration by reason of the novel cam movement employed. The mechanism is very simple and positive and there is no chance of it failing to perform its functions properly.

In describing my invention in detail I do not infer thereby that the invention is limited to the embodiment of it shown herein, as various changes may be made within the scope of the appended claims. I have adapted my device for producing a certain number of oscillations, but my invention is not limited to this precise form.

Having described my invention, what I claim is:—

1. A sewing machine embodying means for stitching a fabric, means for leading a decorative material to the fabric, and means for feeding a holding thread, and automatic means for imparting oscillatory and rotative movements to the said holding thread feeder, and arranged to cause the holding thread to be passed back and forth between the sewing thread and fabric and also to encircle the decorative material.

2. A sewing machine embodying means for stitching a fabric, means for leading a decorative material to the fabric, means for feeding a holding thread, and automatic means operated in synchronism with the stitching means and arranged to impart oscillatory movements to the holding thread feeder and arranged to impart successive rotative movements thereto progressing in the same direction, to cause the holding thread to be passed back and forth between the stitching and fabric and to encircle the decorative material and stitching, to form loops over the decorative material, in the same direction.

3. A sewing machine embodying a needle shaft and needle, means for feeding a decorative material to the fabric, means for feeding a holding thread and rotatable around the needle shaft and means automatically imparting oscillatory and rotative movements to the holding thread feeder and arranged to cause the holding thread to be

passed back and forth between the sewing thread and fabric and to encircle the decorative material.

4. In a sewing machine embodying means for stitching a fabric, means for feeding a decorative material to the fabric, means for feeding a holding thread, and means operated automatically by the sewing machine and adapted to impart oscillatory and rotative movements to the said holding thread, whereby the holding thread will be passed back and forth between the stitching and fabric and around the decorative material, and manually operated means for simultaneously imparting oscillatory or rotative movements to said holding thread device for the purpose of following the direction of feed of the machine.

5. In a sewing machine embodying means for stitching a fabric, and a main shaft for operating the same, means for feeding a decorative material to the fabric, means for feeding a holding thread, and means operated from said main shaft and automatically imparting oscillatory and rotative movements to the holding thread device, and arranged to cause the holding thread to be passed back and forth under the stitching and also encircle the decorative material.

6. In a sewing machine embodying means for stitching a fabric, a needle shaft means rotative around the needle shaft, and provided with means for holding a spool, means for placing a tension thereon, means for guiding the thread from said spool; and means automatically imparting oscillatory and rotative movements to the said spool holding device, and adapted to cause the thread from said spool to be passed back and forth under the stitching thread and also encircle the decorative material.

7. In a sewing machine embodying means for stitching a fabric and feeding a decorative material to the fabric, a main shaft for operating the stitching device, means for feeding a holding thread under the stitching and around the decorative material, means operated from the main shaft, and adapted to reduce the speed from the main shaft, means for converting said reduced motion into oscillatory movements of different extents, and means for conveying said last motions to the said holding thread device, whereby the latter will be caused to oscillate and rotate for the purpose set forth.

8. In a sewing machine embodying means for stitching a fabric and feeding a decorative material to the fabric, a main shaft for operating the stitching device, means for feeding a holding thread under the stitching and around the decorative material,

means operated from the main shaft and adapted to reduce the speed from the main shaft, means for converting said reduced motion into oscillatory movements of different extents and so that the greater oscillations progress in the same general direction and means for conveying said motions to the said holding thread device, whereby the latter will be caused to oscillate and rotate for the purpose set forth.

9. In a sewing machine embodying means for stitching a fabric and feeding decorative material to the fabric, means for feeding a holding thread under the stitching and around the decorative material, a cam and means coöperating therewith said cam and said means automatically causing oscillations and rotations of said holding thread device, and arranged to cause the holding thread to be passed back and forth under the stitching and also encircle the decorative material.

10. In a sewing machine embodying means for stitching a fabric and feeding decorative material thereto, means for feeding a holding thread, and means for imparting oscillatory and rotative movements to said latter means, whereby the holding thread will be passed back and forth under the stitching and around the decoration and embodying a gear and a revoluble cam having a flange engaging the gear teeth and formed with curves of different extent said flange terminating in ends spaced apart, whereby the flange will engage with different teeth of the gear to cause oscillatory and progressive rotative movements in the gear.

11. In a sewing machine embodying means for stitching a fabric and for feeding decorative material thereto, means for feeding a holding thread and means for imparting oscillatory and rotative movements to said last means, and embodying a gear and a cam coöperating with said gear, and adapted to cause the gear to oscillate and rotatively progress, a planetary gearing through which the movements of the gear are transmitted to said holding thread device, a manually operated device and means for imparting the movements thereof to said holding thread device through said planetary gearing, whereby the holding thread device may be oscillated independently of, and simultaneous with, the movements caused by said cam.

Signed at the city, county and State of New York, this 30th day of June, 1911.

JOSEPH A. GROEBLI.

Witnesses:

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