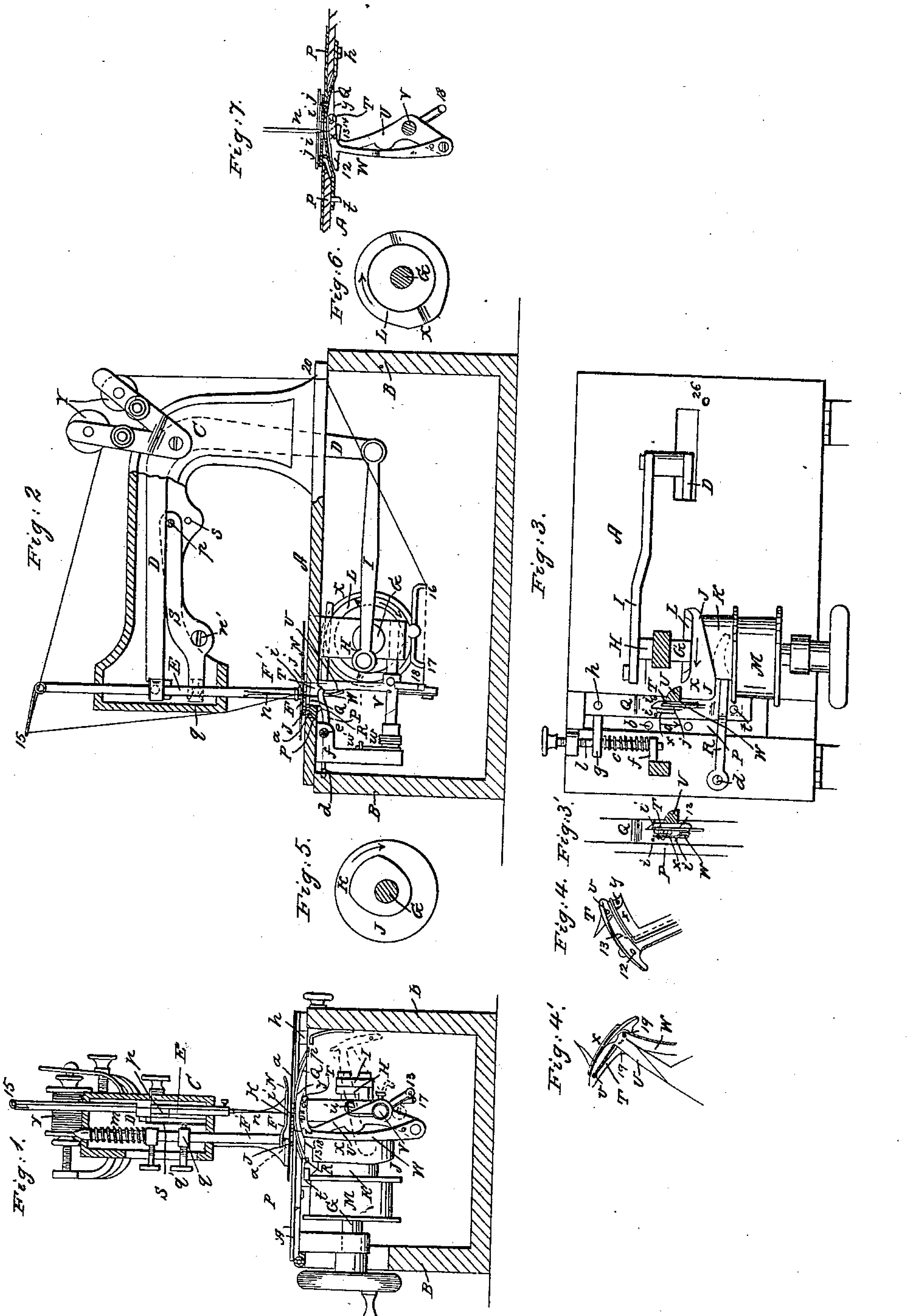
C. SCOFIELD.

Sewing Machine.

No. 26,059. Patented Nov. 8, 1859.



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UNITED STATES PATENT OFFICE.

CHARLES SCOFIELD, OF ADAMS, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **26,059**, dated November 8, 1859.

To all whom it may concern:

Be it known that I, CHARLES SCOFIELD, of Adams, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of a machine with my improvements in a plane passing through the needle in the direction of the feed movement, representing it in a condition for working with the double-looped stitch. Fig. 2 is a vertical section of the same at right angles to Fig. 1. Fig. 3 is an inverted plan of the same, partly in section. Fig. 3* is an inverted plan of the stitch-making mechanism in a different position to that shown in Fig. 3. Figs. 4 and 4* are perspective views of the looper, taken in different positions and under different conditions. Fig. 5 is a section of the feed-cam, taken perpendicular to the shaft. Fig. 6 is a face view of the looper-cam. Fig. 7 is a section of the stitch-making devices in a plane corresponding with Fig. 1, but representing them in condition for making the chain-stitch.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists in an improvement in the feeding devices of sewing-machines, whereby a more positive movement of the material being sewed and a greater degree of uniformity in the length of stitches are insured, and in sewing thin fabrics their liability to pucker is much reduced.

It also consists in a certain mode of applying the pressure-pad, in combination with the needle-lever or needle-carrier, whereby the said pad may be caused to rise at the will of the operator while the needle is in the material being operated upon, to permit the cloth to be turned freely for the sewing of curved seams or stitching of ornamental figures, or may be allowed to remain stationary upon the material in sewing straight or very slightly curved seams.

It also consists in a certain construction of looper, applicable either to the loopers of machines for sewing in what is known as the "double-looped stitch," constituting the subject of Letters Patent No. 9,592, or to those for sewing the chain-stitch by which the missing of the loops by the needle, so common in most machines, is more effectually prevented.

It further consists in a certain contrivance applied to a looper for the purpose of adapting the same looper without the addition or removal of any of its parts to the sewing of the chain-stitch or the double loop-stitch, as may be desired.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

A is the bed-plate of the machine, supported on a box or stand, B, to which it is hinged at one side in such a manner as to be capable of being raised to a vertical position to expose the parts beneath for examination, adjustment, or repair.

C is the standard, erected on the said plate to carry the needle-lever D, needle-bar E, and pressure-pad F.

G is the driving-shaft, working in suitable bearings attached to the bottom of the bed-plate, having at one end a crank, H, which is connected by a rod, I, with the needle-lever to drive the needle, and carrying a quadruple cam, J K L X, for driving the feeding device and the looper. M is a pulley on the said shaft for driving it by a belt.

N is the feed-plate, consisting of a thin but stiff plate of metal, as long and considerably wider than the pressure-pad F, fitted to the top of the bed-plate A below the pressure-pad, and covering an aperture, *a a*, made in the latter plate. This plate is attached rigidly by screws *b b* (see Fig. 3) to a slider, P, which has a horizontal motion in a guiding-groove in the bottom of the bed-plate imparted to it by the combined agencies of the face J of the cam and a spring, *c*, the said cam operating through the agency of a horizontal lever, R, Figs. 2 and 3, which works on a fulcrum, *d*, below the bed-plate, and which is held in contact with a pin or projection, *t*, on the bottom of the slider P by means of the spring *c*, and the said spring being applied around a guide-pin, *e*, and between a fixed bearing, *f*, on the bed-plate and a lug, *g*, on the slide. The cam is so set rela-

tively to the needle-crank H that the face J drives the slider and feed-plate in the direction of the arrow 10, Figs. 1 and 3, while the needle *n* is out of the material being sewed, and that the spring *c* drives them back again while the needle is in the material. The length of the movement of the slider is varied by an adjustable stop-screw, *l*, applied as in other feed motions.

Q is a second plate, which is elastic, and attached at one end by a screw, *h*, to the slider P below the plate N, and which has attached to it a number of sharp-pointed pins or teeth, *i i*, which are arranged exactly opposite to holes *j j*, provided in the plate N below the pressure-pad and on opposite sides of the slot *k*, which is made in the said plate for the needle to work through. The natural elasticity of this plate Q tends to withdraw the pins or teeth *i i* below the upper surface of the plate N; but the said plate Q is supported at the opposite end to the screw *h* on the top of the lever R, which is allowed a certain amount of vertical motion, as well as the horizontal motion before spoken of, and which, just before the horizontal movement of the plates N Q in the direction of the arrow 10 commences, is raised by the peripherical surface K, Fig. 5, of the cam, and caused to raise the plate Q and protrude its teeth *i i* through the upper surface of the plate N, for the purpose of catching into the material to be sewed. The said lever R is, however, allowed by the cam to descend again to withdraw the teeth from the material before the return horizontal movement of the plates N Q takes place. The movement produced by the face J of the cam is of such character that the horizontal movement is suspended entirely for a time after taking place in either direction, and it is during such suspensions that the plate Q rises and descends.

In this feeding device the plate N constitutes a perfect flat bearing-surface for the material while the teeth which bite the cloth are withdrawn, such surface being only broken by the needle-slot and the small holes *j j*, which are insignificant as compared with the large opening left by a feeding-dog which rises and falls in an open slot or slots in the bed-plate, and the material being kept very flat upon the surface of the said plate has a very positive movement given it by the teeth *i i*, as after having risen they move with the plate N, and so a very uniform degree of feed and length of stitch are produced. As the plate N returns while the needles in the material and its upper surface is well polished, it cannot carry back the material along with it.

The manner in which I propose to effect the lifting of the pressure-pad F is as follows: The upright stem F′ of the pad, which is fitted to guides in the standard E, and has a spring applied in the usual manner, is connected with the front end of a lever, S, which works on a fulcrum, *n′*, secured in the standard C. On one side of this lever, near its rear end a pin or projection, *p*, is so formed or applied that the needle-lever strikes it and drives it downward every time it brings down the needle, and so forces down the rear end of the said lever S, and raises the other end to which the stem F′ is attached, and by that means lifts up the pad E and leaves the material under operation free to turn on the needle. The connection of the lever S with the stem F′ is made by a movable collar, *q*, fitted to the said stem and secured thereto by a set-screw, *q′*, and by shifting this collar lower down or higher up the stem the pressure-pad may be raised higher or lower, as may be desired. For sewing straight or very slightly-curved seams, the collar *q* is to be shifted so high up the stem as to carry down the rear end of the lever S so low that the needle-lever will not strike the pin *p*, and hence the pad will be allowed to remain stationary. The lever S is furnished with a knob, *r*, at its rear extremity, which may be laid hold of to raise the pressure-pad to adjust the material preparatory to the sewing operation, and by making the rear portion of the said lever elastic laterally, and so that the extremity of the pin *p* may spring into a hole, *s*, in the standard C, the pressure-pad may be secured in its elevated position during the adjustment of the material.

T is the principal portion of the looper, made substantially like the loopers in many machines heretofore constructed for sewing the chain-stitch, and with an eye, *v*, near the point, as in the machines for making the double-looped stitch. This portion of the looper is secured to or made in the same piece with a lever, U, which is secured to a horizontal rock-shaft, V, working in fixed bearings below the bed-plate, which rock-shaft has the necessary rocking motion imparted to it through the combined agencies of the face L of the cam and a spring, *u*, coiled round the said rock-shaft, the said spring having one end fast to the rock-shaft, and the other resting against a fixed pin, *u′*, and serving to keep the lever in contact with the cam, and to carry back the lever and looper after the latter has been driven forward past the needle to make the stitch by the action of the face of the cam upon the lever.

x is another portion of the looper, made of a thin piece of steel or other metal, of the same or nearly the same profile form as the piece T, but having at its point an opening or fork, *y*, Fig. 4, extending as far back as the eye *v* of the piece T. The said piece *x* is attached to the bottom of the lever U by a long spring, W, which, when uncontrolled, presses the piece *x* closely against the side of the piece T which is nearest the needle, so that the two pieces have the appearance of being united together, and can enter between the needle and its thread as though they were united;

but at a proper stage of the operation, as will be presently described, the said spring W is acted upon by a projection on the peripherical surface *x* of the cam to open or move away the piece *x* in a lateral direction from the piece T. Between the pieces T and *x* there is fitted into a cavity in the piece T, and attached to the said piece by a pivot, 12, a small lever-like piece of steel or other metal, 13, which has a heel projecting beyond the back of the looper, to enable it to be laid hold of with the fingers for the purpose of bringing it to the position shown in Figs. 1 and 4—that is to say, flush with the top and bottom of the looper—or to the position shown in Fig. 7—that is to say, projecting below the looper to form a shoulder, 14, Fig. 7.

Y is the spool which supplies the upper thread to the needle, and Y′ that which supplies the under or locking thread in working the double-looped stitch, both spools being arranged on the top of the standard C. The upper thread is shown in red and the under or locking thread in blue color. The upper thread passes to the needle through a guide, 15, attached to the needle-bar, and the lower one passes down through a hole, 20, in the plate A, from thence through fixed guides 16 17 to a guide in an arm, 18, attached to the looper-lever U, from thence through a hole, 19, in the heel of the looper, and from thence to and through the eye *v* and fork *y*. To permit the looper to be threaded without difficulty, it is only necessary to slip the end of the spring *u* aside past the end of the pin *u′*, and thus allow the lever U and shaft V and their appendages to swing round to the position relatively to the bed-plate A shown in red outline in Fig. 1, and after the looper is threaded and the lever thrown back against the face L of the cam the latter can be again secured in an operative condition by slipping the spring *u* behind the pin *u′*.

I will first describe the operation of sewing with the two threads in what is known as the "double-looped stitch." The piece 13 of the looper has been set in the position indicated in Figs. 1, 2, and 4—that is to say, having no projecting shoulder 14, such as is shown in Fig. 7—and the needle and looper having been threaded, the shaft is set in motion. The descent of the needle through the cloth is followed by the advance of the looper between it and its thread in the usual manner, the looper being at the time closed up, as shown in Figs. 2, 3, and 4*. After the needle has been retracted and the feed movement given to the material, and just as the needle is about to penetrate the material again, the looper is opened, as shown in Fig. 4, by the action of the cam on the spring W, and in this open condition it retreats, while the needle, having been again protruded through the cloth, passes down between the parts T and *x*, and in its retreat it (the looper) draws the thread which has been extended between the eye *v* and fork *y* against the needle, and so forms the loop which is left within the loop of the needle-thread formed by the preceding stroke of the needle, and which will have left within it the loop formed by the next stroke of the needle. By thus causing the under thread to be extended in a positive manner directly across the needle, and so drawn against the needle, the loop of the under thread is caused to be infallibly formed and retained by the loop formed on the needle-thread by the succeeding ascent of the needle.

To sew with a single thread in the chain-stitch, it is only necessary to break the under thread close to or behind the eye of the looper and to change the position of the piece 12 to that shown in Fig. 7 to form the shoulder 14, when the sewing may be at once proceeded with. The duty of the shoulder 14 in sewing this stitch will be obvious to those familiar with the sewing-machines—viz., to prevent the loop of the needle-thread slipping too far back in the looper for the needle to pass through it in its next descent. The opening of the part *x* of the looper is the same in this operation as in forming the double-looped stitch, and is of the same advantage, effecting the positive extension of the loop in such form that the needle cannot fail to pass through it.

The looper, made of two pieces, T *x*, combined and operating as described, may be used without the piece 13 in a machine for making only the two-thread or double-loop stitch, or with a permanent stop, such as is represented at 14 in Fig. 7, attached to the part X, for making only the chain-stitch. The piece *x*, instead of having a forked end, may have an eye like that *v* in the piece T.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The auxiliary feeding-plate Q, with pins or teeth on its surface, in combination with the perforated slotted main feeding-plate N, when said plate Q combines in itself the properties of a spring and of a feed-bar, and is otherwise constructed and arranged so as to operate in the manner herein described.

2. The arrangement of the pivoted lever S, adjustable collar *q*, pressure-pad F F′, and needle-lever D in the relation shown to one another, and for united operation in the manner and for the purpose set forth.

3. The lever S, when made elastic laterally, pivoted at *n*, provided with a pin, *p*, and coupled to the pressure-pad F F′ by an adjustable collar *q*, in combination with the needle-lever D and the recess *s* in the standard C, substantially as and for the purposes set forth.

4. The looper W *x* U T, when the part U T is made rigid and attached to a horizontal rock-shaft, V, and the part W *x* is made yielding or with a spring, and formed or arranged on one side of part U T, and in the

relation shown to a projection on the peripherical surface X of the actuating-cam, in the manner and for the purpose herein described.

5. The combination of the adjustable intermediate plate, 13, with the jaws T x of the looper, substantially as described, for the purpose of adapting the same looper, without removing it from the machine, which is used for sewing either in the double-looped or other stitch made with two threads, for sewing, in the chain-stitch, as set forth.

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