W. R. LANDFEAR.

Sewing Machine.

No. 109,427. Patented Nov. 22, 1870.

Fig. 1

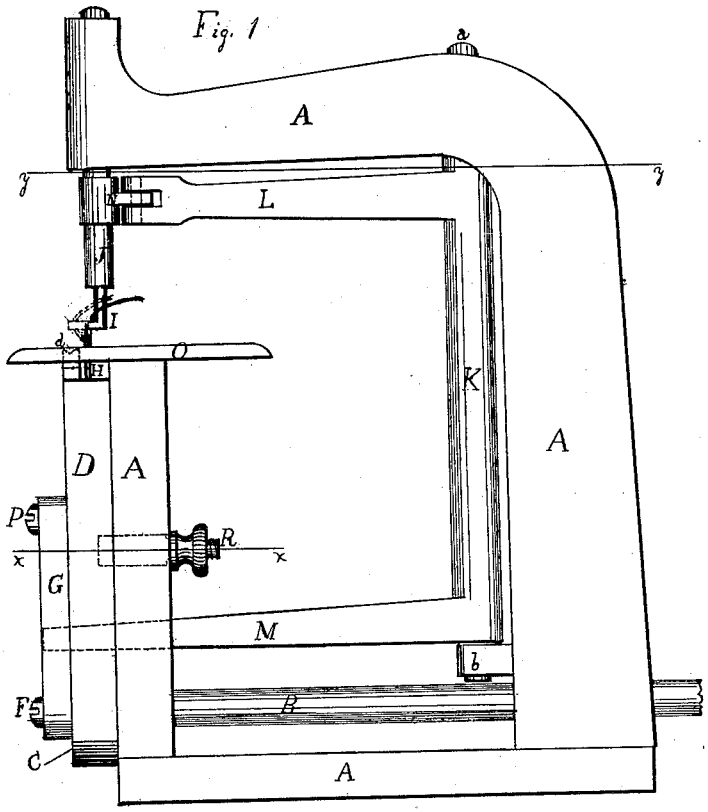

Fig. 2.

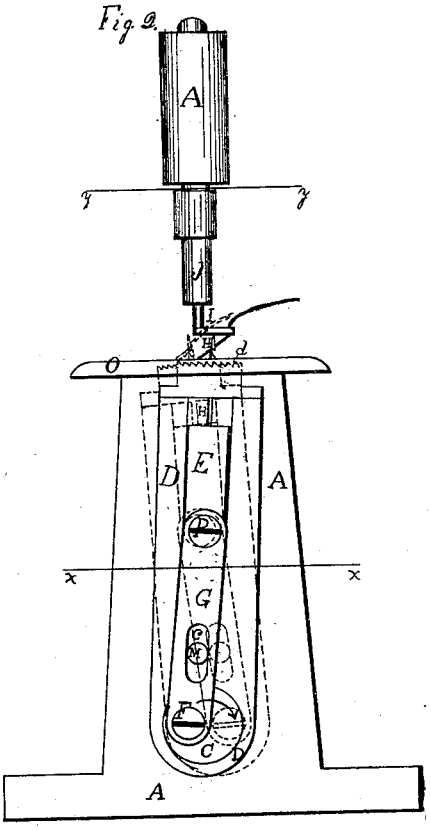

Fig. 3.

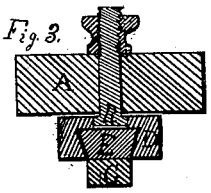

Fig. 4.

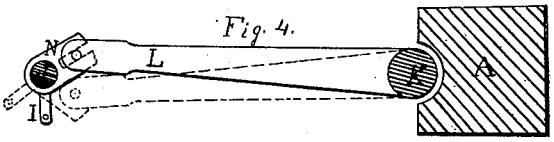

Fig. 5.

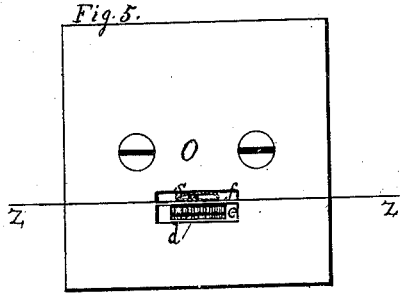

Fig. 6.

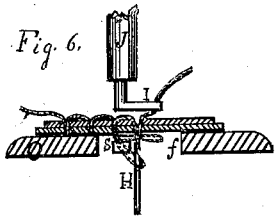

Fig. 7.

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UNITED STATES PATENT OFFICE.

WILLIAM R. LANDFEAR, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **109,427**, dated November 22, 1870.

I, WILLIAM R. LANDFEAR, of Hartford, in the county of Hartford and State of Connecticut, have invented a new and Improved Sewing-Machine, of which the following is a specification, reference being had to the accompanying drawing, in which—

Figure 1 is a side elevation. Fig. 2 is a front elevation. Fig. 3 is a section of a part of the machine, taken in the line *x x*, Figs. 1 and 2. Fig. 4 is a section taken in the line *y y*, Figs. 1 and 2. Fig. 5 is a top view of the plate for supporting the work. Fig. 6 is a vertical section of the same, taken in the line *z z*, Fig. 5. Fig. 7 is an enlarged view of the needle.

Similar letters of reference indicate corresponding parts.

This invention relates to a new and improved sewing-machine of that class which forms the chain-stitch by means of a hooked needle and single thread, and is intended particularly for sewing leather with a waxed thread, though it may be also used for sewing other materials.

A represents the frame of the machine; B, a shaft fitted in bearings in the frame, and C the head of the shaft, which is turned eccentric to the center of the shaft. D is a perpendicular bar, in which the eccentric head C is fitted so as to turn in a bearing near the lower end of the bar, and which rests against the standard forming the front of the frame of the machine. On the top of this perpendicular bar is the feeding-surface *d*.

E is a slide fitted in the bar D so as to move freely up and down in the bar. This slide is connected with a crank-pin, F, in the eccentric shaft-head by means of the pitman G. To the upper end of the slide is attached a hooked needle, H, pointing upward. Nearly over the needle is situated a perpendicular rod, J, fitted so as to turn freely in its bearing in the upper part of the frame; and a thread-guide, I, is attached rigidly to the lower end of the rod, and is bent nearly at a right angle with the rod. The office of this thread-guide is to guide or convey the thread across and against the needle, so that it may be caught by the hook of the needle. This result is accomplished by the partial revolution of the rod J, and consequently of the thread-guide, through which the thread is passed as it is conveyed from the bobbin or ball to the material to be sewed.

K is an upright rod or shaft near the back part of the frame, in length nearly the height of the machine, and fitted to the frame in bearings at *a* and *b*. From this upright rod proceed the two parallel horizontal arms L and M, the former near the top and the latter near the bottom of the frame, extending nearly to the front of the machine. These arms are rigidly secured to the upright rod K.

The front end of the upper horizontal arm, L, is connected with the thread-guide rod J by means of the short arm, N, or otherwise, in such a manner that a lateral motion imparted to the end of the arm L, either to the right or left, will cause the rod J to turn or partially revolve in its bearing, as shown in Fig. 4.

The lower horizontal arm, M, is longer than the arm L, and extends through the standard at the front of the frame, and also through the bar D, an opening being made for the purpose. The extreme front end of the arm then enters the vertical slot *c* in the pitman G.

It will be perceived that a horizontal motion imparted to this front end of the arm M must necessarily impart a corresponding horizontal motion to the front end of the upper horizontal arm, L, and consequently cause the turning of the thread-guide rod J, as described; and as the long upright rod K can turn in its bearings *a* and *b*, the two parallel arms L and M may freely swing or vibrate horizontally.

When the machine is to be used the leather or other material to be sewed is placed upon the plate O, and is of course held in place by a presser-foot, which it is not necessary here to describe.

We will now suppose the crank-pin F and eccentric C, and therefore the slide E and bar D, to be at their lowest points of motion. Now, when the shaft is rotated in the direction indicated by the arrow in Fig. 2, the eccentric shaft-head will cause the bar D to rise, so that the feeding-surface *d*, at its upper end, will project through the slot *e* in the plate O and rise a short distance higher than the upper surface of the plate. At the same time the crank-pin F will cause the pitman G, and consequently the slide E, to rise and force the pointed and hooked needle up through the leather, a slot, *f*, being provided in the plate

O for the passage of the needle. As the crank-pin continues its revolution the pitman is caused thereby to swing laterally at its lower end (the upper end turning on the pin P, by which it is secured to the slide E) until the pitman assumes the position shown in dots in Fig. 2. Now, as the end of the horizontal arm M is connected with the pitman, as above described, the arm is caused to move horizontally by the swinging motion of the pitman, and as the pitman is slotted perpendicularly there is no tendency to move the arm up and down, but only sidewise. This horizontal motion of the arm M, and therefore of the arm L, causes the turning or partial revolution of the thread-guide, as already described, and the thread-guide carries the thread across the needle and into the eye or hook of the same, as shown in dots in Fig. 1. While this is being accomplished the eccentric shaft-head is swinging the lower end of the bar D a little in the same direction in which the pitman is caused to swing by the crank-pin, and the bar D turns on the fulcrum R, which is secured to the frame, so that the upper end of the bar must swing in a direction opposite to that of the lower end. This swinging motion of the bar is for the purpose of feeding forward the material which is now resting on the top of the feeding-surface, and is held firmly thereon by a presser-foot in the ordinary manner.

The fulcrum R does not move with the bar D, but the bar is slotted, so that it may slide up and down on the fulcrum, and the fulcrum may be adjusted at any required height, in order to regulate the extent of the horizontal swinging motion of the upper end of the bar, and consequently the length of stitch.

As the shaft continues to revolve the eccentric shaft-head draws down the bar D, withdrawing the feeder from the leather, and swings it back to its first position below the surface of the plate.

While the bar D is being drawn downward the crank-pin also draws down the slide E with the needle, and the needle draws thread down through the material, forming a loop below.

The crank-pin then swings the pitman back to its first position, thus causing the thread-guide to return to its original position, and, by again raising the slide E, forces the needle again up through the material, the loop remaining around the needle below the top of the plate O. The thread is then again conveyed into the eye of the needle by the thread-guide, and another loop is drawn down through the first loop, thus forming the ordinary chain-stitch, the feeder at the same time operating as before.

I do not wish to limit myself to any particular manner of connecting the end of the arm L with the thread-guide rod, or to any particular manner of connecting the arm M with the pitman.

Thus I produce a very simple and easy method of operating the thread-guide, and the perfect co-operation of the needle and thread-guide is rendered quite certain without the use of cams or springs.

In order to prevent the hook of the needle, while drawing down a loop, from catching the last previously-formed loop, it is usual to employ some means to cover the hook during its descent; but I employ, instead, a loop-supporter, S, situated within the slot *f* and near the needle, but on the side opposite the hook of the needle and a little lower than the top of the plate. When the needle is drawing down a loop the last previously-formed loop will rest upon this loop-supporter and be held in a horizontal position within the slot *f*, as shown in Figs. 5 and 6, instead of hanging down by the side of the needle exposed to the hook, as shown in dots in Fig. 6; therefore the hook of the needle passes below the horizontal loop before the loop is drawn up to the leather by the tension produced by the drawing down of the new loop. I thus gain a great advantage in the substitution of this very simple and effective device for the complicated and troublesome cast-offs and other devices usually employed for the purpose.

When the needle punctures the leather or other hard and stiff material a certain roughness appears on the side from which the needle emerges, in consequence of the pushing out of the fiber or substance of the material by the pressure of the needle. To prevent this rough appearance, it is usual, in machines of this class, first to pierce the leather with an awl from the side opposite to that from which the needle is to enter. Instead of using an awl I make a notch or shoulder, or more than one, by cutting slightly into the needle below the hook, as shown in the magnified needle represented in Fig. 7. This notch or shoulder *g* catches the protruding fiber and draws it back when the needle is being retracted from the material, and thus leaves the face side of the material smooth, and the material has the appearance of having been pierced from the side opposite that from which the needle has actually entered.

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

1. The arms L and M and the upright K, connected with the thread-guide and operated from the link that moves the needle, all constructed and operating as described.

2. The loop-supporter, arranged and operating substantially as described.

3. The needle constructed with one or more shoulders or notches for drawing back the fiber of the material, substantially as described.

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