(No Model.)

A. A. BOUTON.

SEWING MACHINE.

No. 378,653. Patented Feb. 28, 1888.

Fig. 1.

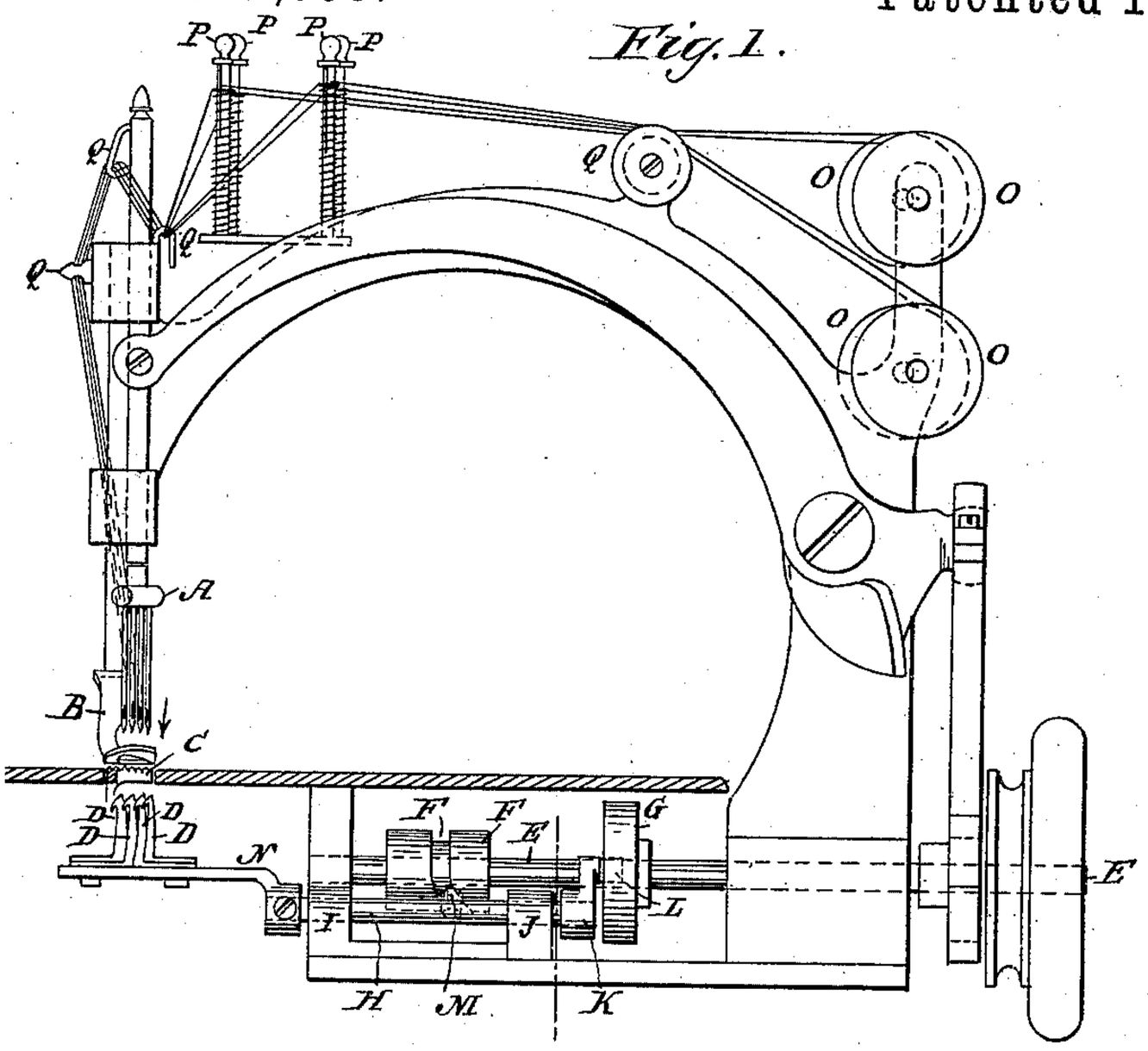


Fig. 6.

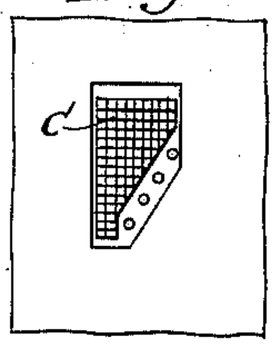


Fig. 7.

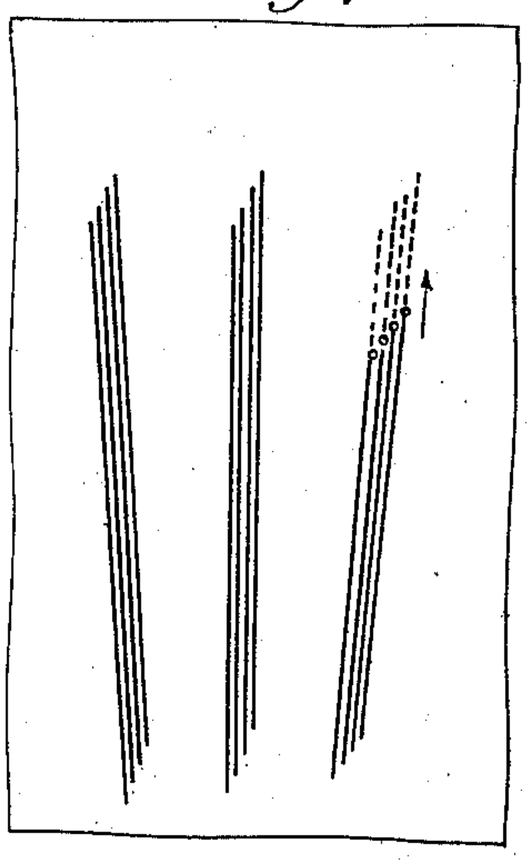


Fig. 2.

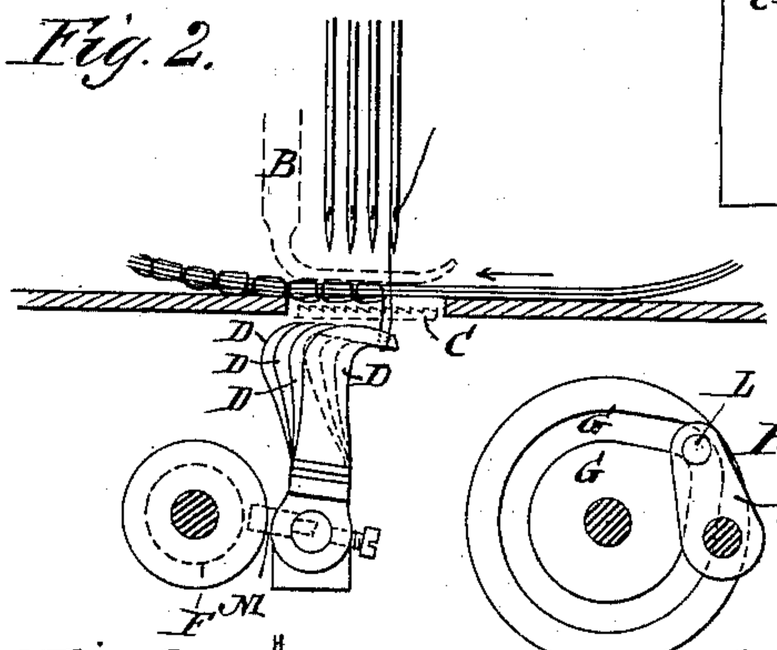


Fig. 3.

Fig. 4.

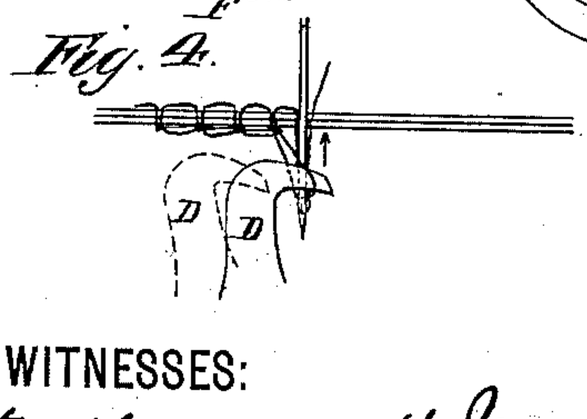
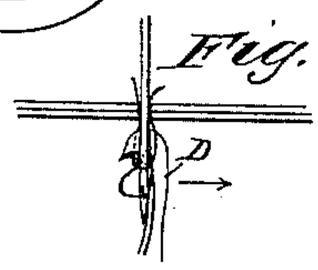


Fig. 5.



WITNESSES:

F. Hammatt Morton.

Geo. A. Goss,

INVENTOR

Arthur A. Bouton.

BY Phillips Abbott,

his ATTORNEY

UNITED STATES PATENT OFFICE.

ARTHUR A. BOUTON, OF BROOKLYN, ASSIGNOR TO JULIUS KAYSER, OF NEW YORK, N. Y.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 378,653, dated February 28, 1888.

Application filed June 27, 1887. Serial No. 242,686. (No model.)

To all whom it may concern:

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

My invention pertains to improvements in the construction and operation of sewing-machines, with special reference to the needles and the hooks or loopers which engage the stitches, whereby I am enabled to produce upon the backs of gloves, mitts, and in other like instances where the same are desired, a number of rows of stitching close together and all at the same time.

In the drawings, Figure 1 illustrates a front elevation, the cloth-plate being in section. Fig. 2 illustrates an enlarged end view of the hooks and cloth-plate in transverse section. Fig. 3 illustrates an enlarged detail of the rocking cam on line *x x* of Fig. 1. Fig. 4 illustrates action of the loopers or hooks—*i. e.*, for the chain-stitch. Fig. 5 illustrates the same as Fig. 4, showing front view. Fig. 6 is a plan view of a portion of the machine-bed, showing the relative arrangement of the feed and needles. Fig. 7 is a view of the stitching done by the machine.

The construction and operation of sewing-machines are so well known that a description of the parts only which are immediately connected with the invention will be made. It should be stated, however, that I prefer to use my invention in connection with the well-known Willcox & Gibbs machine, and that I preferably produce the "chain-stitch," so called.

A is the needle-holding head, which has the ordinary up-and-down movement. I arrange in this head the usual slots for receiving and holding the needles. Instead of locating them side by side and in a line at right angles to the line of feed, as is usually the case when more than one needle is used, I arrange them, as shown in Figs. 1, 2, and 7, with each successive needle advanced somewhat in front of the one immediately behind it, the row of needles lying at an angle to the feed. By this construction I am enabled to get the necessary separation of the needles relative to each other, and yet the lines of stitches sewed by the needles will be very close to each other, and, if desired, will touch each other. Of course the holes in the presser-foot B are made so as to conform to this arrangement of the needles, and the feed-plate C is also arranged as to width and length so as to have the proper relation to the needles.

D are the loopers or "hooks," as I will hereinafter call them. They are placed underneath the table, as shown, and they have the same relation to each other that the needles have—that is to say, each hook is set somewhat in advance of the one immediately behind it. These hooks are not the ordinary rotary loopers, but have a forward-and-back rocking movement and also a longitudinal reciprocating movement. These movements are imparted to them by the following mechanism: On a shaft, E, which is journaled in any suitable bearing, are placed two cams, one of them, F, having a cam-groove with longitudinal divergence, and another cam, G, being provided with a groove having radial divergence. Both of these forms of cam are well known. The shaft E is driven in any suitable manner, preferably from the main driving-wheel, as shown.

H is another shaft having a reciprocating sliding motion in the bearings I and J. On one end of this shaft is a crank, K, having a pin, L, on its end, which enters and plays in the slot in the cam G. The pin is sufficiently long and the cam-groove sufficiently deep so that the slight longitudinal sliding movement of the shaft H, hereinafter described, does not remove the pin L from the groove.

M is a pin fast on the side of the shaft H, which plays in the groove in the cam F. The length of this pin and depth of the groove are such that the pin will not be lifted out of the groove by the slight rocking motion of the shaft H. The hooks D are attached to a suitably-constructed plate or arm, N, attached to the end of the shaft H.

The compound movement of the parts referred to above is as follows: The cam G, acting through the crank and pin K L, gives a slight rocking movement to the hooks D during a small portion of the revolution of the

cam G, and the cam F gives to the hooks D a slight longitudinal reciprocating movement during a portion of the revolution of the cam F.

There being four needles shown in this case, although I do not limit myself to four, there are of course four spools of thread, O, &c., four tensions, P, and guiding devices Q Q, &c.

The work produced by the machine as above arranged is shown in Fig. 7, the four needles and the direction of their travel being shown at the right of this figure.

The method of making the stitches is as follows: The commencing position being shown in Fig. 2, (only one needle is shown as threaded, for the sake of clearness,) the work is then fed, the needles make their downstroke, and the hooks are thrown by the cam F toward the needles as it passes through the loop of the thread. (See Figs. 4 and 5.) The needles then rise, and new loops are in turn caught by the hooks.

The needles may be set so as to run from left to right or from right to left, and the stitching will of course end and commence on an angle or bevel, as shown in Fig. 7, the length of all the lines of stitches in a set being the same and the points of their commencing and stopping being quite near each other. This, in the instance of gloves, is preferred by many persons to the square-end stitching; but if the square end be desired it is a simple matter to pick out the few stitches necessary at the ends of the rows.

Prior to my invention more than one needle has been used in the same machine at the same time, and the needles have been set in front of each other; thus more than one row of stitches have been sewed simultaneously. But the prior use of needles thus set has always been in connection with the rotary loopers, well known, and their needles, if close enough together to do practical double stitching, had to be separated from each other longitudinally a distance equal to the diameter of the rotary looper—about an inch; thus in the case of sewing four rows of stitches together on a glove or mitt, as shown in Fig. 7, the point where the last row commenced would be about four inches distant from the point where the first row commenced, or about twice as long as the proper length of the stitching.

It is also true that oscillating hooks similar to those shown by me, although not actuated by the same mechanism, have been used before, but never set one in front of the other, nor in connection with needles so set, and, as I believe, it is only by the coaction of these two elements, arranged as shown by me and operating as described, that the desired result of rows of stitches lying close together and commencing close to each other longitudinally can be attained and the said ornamental stitching suitable for the backs of gloves and mitts produced.

My improvement is applicable to a great variety of uses aside from the ornamentation of gloves and mitts.

I do not limit myself to the details of construction shown, because differences in detail can be made and still my invention be employed.

I claim—

The described improvement in sewing-machines, consisting in two or more needles placed one in front of the other relative to the line of feed, correspondingly-arranged looping-hooks rigidly attached to a rocking and longitudinally-moving arm or plate underneath the cloth-plate, appliances for supplying and guiding the threads to the needles, a pressure-foot and feed mechanism, and mechanism for operating the said devices, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 20th day of June, A. D. 1887.

ARTHUR A. BOUTON.

Witnesses:

F. HAMMATT NORTON,

GEORGE A. VOSS.