

UNITED STATES PATENT OFFICE.

A. W. SANGSTER, OF BUFFALO, NEW YORK, ASSIGNOR TO V. M. RICE, JOEL THAYER, JAS. SANGSTER, AND ELIZA REMINGTON, ALL OF SAME PLACE.

SEWING-MACHINE.

Specification of Letters Patent No. 20,531, dated June 8, 1858.

To all whom it may concern:

Be it known that I, AMOS W. SANGSTER, of the city of Buffalo, county of Erie, and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I declare the following description of my method of constructing and operating the said improvements to be sufficiently clear and exact to enable others skilled in mechanics and the use of sewing-machines to make and use my invention of improvements, and for that purpose reference is had to the accompanying drawings, which form a part of this specification.

Figure 1, in said drawing is a perspective view of the machine, showing the construction and operation of the feeding machinery also the machinery for drawing up the slack thread and tightening the stitch, after the shuttle has passed through the loop formed from the thread drawn from the spool A. Fig. 2, represents a section of the feeding bar with its foot piece, the spring-thread carrier, and the shuttle with the hook fastened to it preparatory to drawing the upper thread M through the cloth to form the loop. Fig. 3, represents the hook "(7)" and the shuttle R in their positions after the shuttle carrier has forced them through the loop, (formed from spool A). This loop may be more clearly seen by reference to Fig. 4. Fig. 4, is intended to show the position of the hook and shuttle, and the position of the machinery operating them, after the upper thread has been drawn below the bed plate, and when their respective positions are about to be changed by the operation of the machinery in forcing the hook and shuttle through the loop. Fig. 5, represents the bobbin on which the shuttle thread is wound. Fig. 6, represents the rod or axle on which the bobbin revolves, when all parts of the shuttle are secured to their proper places and when the shuttle thread is being drawn therefrom, it also shows the section A⁵ of the shuttle in which said rod is permanently fastened. Fig. 7, represents the hook detached from the shuttle. Fig. 8, is a front view of the hook and shuttle, fastened together, by a set screw, the latter clasped by the case S between which and the shuttle the loop of the upper thread (drawn from the spool A) passes. T, T', and T' (same figure) represent the fingers or forked projection of the shuttle-carrier or arm U

which, with the case S, holds the shuttle in position for sewing. Fig. 9, is a side view of the hook and shuttle fastened together. Fig. 10 represents the shuttle case, detached from the shuttle-carrier or arm U. Fig. 11 represents a back view of the shuttle and the holes through which the shuttle thread passes. Fig. 12, represents two projections from the movable plate D (Fig. 1) the cam and the set screw by which this plate, and the feed-bar are immediately operated, and the length of the stitch governed. Fig. 13 is intended to represent the movable plate P, on the axis P' of which, the shuttle carrier or arm U turns.

In Fig. 1 C represents the crank and wheel the latter of which is attached to the shaft. B—Y is an eccentric, the ring of which holds the arm Z³ which operates a lever below the bed plate B². E represents an eccentric with the projections Z and Z⁸ from its ring, which projections terminate in eyes through which the arms of the lever Y' pass, and in which they are operated. This lever swings upon a hinge at the point X, and to the opposite end of it the spool A is attached. Z' represents a set screw which with a similar one is used to fasten the eyes of the projections Z and Z⁸ to any position on the arms of the lever Y', to which the operator may move them for the purpose of shortening or lengthening the motion of the lever. A² represents a part or arm of the framework to which is attached the feeding-apparatus. U³ is a cam on the end of the shaft B. E³ and E⁴ are projections, from the sliding plate D, operating in a slot in the plate D², against each of which the cam U³ presses in its revolutions, thus raising and depressing the plate D. The feed-bar G is raised by and with the sliding plate D till the foot piece I is just above the cloth when the continued upward motion of the plate D, by the operation of the cam U³ against the set screw U², carries it back above the cloth the length of a stitch when the plate D descends, by the operation of the cam U³ against the projection E⁴, it presses the feed bar downward till the foot-piece I rests firmly upon the cloth by the pressure of the spring J, when the continued downward motion of the plate D carries it and the cloth on which it presses forward the length of a stitch. The space measured by the backward and forward motion of

the feeding bar and its footpiece may be increased or diminished by lowering or raising the set-screw. H represents a lever to which is attached the spring J, whose object is to press upon the top of the feed bar G and thus to hold the foot piece I firmly to the material being sewed, while the feed is being given. L represents a stationary arm or projection fastened to the framework A². R represents the spring thread-carrier or guide. N represents a spring whose object is to hold the cloth by a yielding pressure in the positions gained by the operation of the feeder or foot-piece and to resist the puncturing operation of the hook. M represents the thread which is drawn from the spool A, B² the bed plate of the stand.

In Fig. 2, M, G, N, K, L, and I, represent the same parts of the machine as in Fig. 1. B⁵ represents a projection, from the end of the spring K, with a slit in it to hold the end of the thread when the operator commences sewing. R is the shuttle with the hook fastened to it. The shuttle and hook are shown in their positions when the thread is about to be caught by the hook and drawn through the cloth. S is a side view of the case or shuttle-holder. It is attached to the shuttle carrier or arm U by means of the screw G². T and T' represent a side view of the fingers or projections of the shuttle carrier or arm U, which, with the case, constitute the shuttle holder. W' is an oblong slot, or aperture, in which the pin W is operated. A⁵ represents a section of the shuttle in which is fastened the axle on which the bobbin revolves (see Fig. 6).

In Fig. 3, R, T, T', W, W', M, S, and U represent the same parts of the machine as in Fig. 2. Z³ the same part as in Fig. 1. B³ represents a plate which is to be fastened by screws to the under side of the bed plate B² (Fig. 1). V⁵ and V⁶ represent two vertical guides attached firmly to the plate B³. V and V⁴ are the cases or tubes which are operated vertically upon those guides, by means of the motions of the shuttle carrier and the springs E⁵ and E⁶. V' represents a projection from the case V. The spring E⁵ presses upon the projection V' and is represented at its point of rest. E⁶ is a similar spring which presses downward upon the tube or case V⁴. P is a brace or cross piece between the rods V⁵ and V⁶ at the ends of which attached are the tubes or cases V and V⁴. This crosspiece is made in two parts on the end of one of which is the pin P' which will be seen by reference to Fig. 13. This pin passes through the shuttle carrier or arm U into the opposite part of the cross-piece. The pin is used for a fulcrum or axle on which the shuttle carrier or arm U vibrates, while the shoulders of the cross-piece on either side of this axle-pin, prevent any lateral motion to said arm. A⁷ is a

vertical guide-plate attached by screws to the plate B³. A⁶ is a clasp (or guide plate) fastened at right angles to the shuttle carrier or arm U and when operated it takes hold of and is regulated in its motion by the plate A⁷. B⁴ is a vertical plate to which the lever Z⁴ is attached by a screw which is the fulcrum of said lever.

In Fig. 4, E⁵, E⁶, A⁷, A⁶, V, P, U, V⁴, V⁵, V⁶, V', B³, B⁴, Z³, Z⁴, R, S, T, and T', refer to the same parts of the machinery as are referred to by the same letters in Fig. 3. G⁵ represents the same thing as in Fig. 2. P² represents a female screw, whose object is to limit the downward motion of the tube V⁴ thus limiting the downward motion of the cross-piece P and of the center of the shuttle-carrier U. The principal difference between the parts of the machine represented in Fig. 3 and the same parts represented in Fig. 4 is a change in the relative position of those parts.

In Fig. 4 R represents the shuttle and hook fastened together, and R' the loop of the upper thread. They are in their respective positions, preparatory for the passage of the shuttle and hook through the loop R'.

In Fig. 6 A⁵ represents a section of the shuttle into which the axle or shaft, on which the bobbin revolves, is firmly fastened. The same section of the shuttle is represented by the same letter in Figs. 2, 4, 8, 9, and 10.

A⁷ (Fig. 7) shows the end of the hook which is fastened by the set screw O (Fig. 8) into the end of the shuttle.

In Figs. 8 and 11 M' represents the shuttle thread as drawn from the bobbin preparatory to sewing.

In Fig. 12 V² E³ and E⁴ show the same parts detached which they do in Fig. 1.

In Fig. 13 V, V⁴ and P represent the same parts as in Fig. 3.

When the shaft or axle on which the bobbin revolves is secured into the section of the shuttle A⁵ the bobbin is slipped on to it. This shaft with the bobbin is then fastened into the shuttle by means of the screw on its end, as seen in Fig. 6 which is wound into a female screw, formed within and near the upper end of the shuttle. Care is required in constructing each part of the shuttle. The bobbin must revolve freely and the holes through which the shuttle thread is drawn should be smoothly wrought that the thread may not be cut or marred. The exterior of the shuttle should be thoroughly polished as well as those parts of the shuttle holder with which the thread may come in contact that its loops shall not meet with any impediment. After the shuttle is supplied with thread and the hook is fastened to it, as described, they are placed in the case at the end of the shuttle carrier or arm U.

When operated the machine works substantially as follows. A short piece of the shuttle thread being allowed to hang loose from the external surface of the shuttle the upper or spool-thread M is then drawn through the aperture in the underside of the foot piece I and fastened (by means of a knot which is to be formed at the end of this thread when commencing to sew) in the slit of the projection B⁶. By revolving the crank and wheel C, the arm Z³ is pressed downward by the operation of the eccentric Y to which it is attached. This arm being fastened to the lever Z⁴ operates it upon its fulcrum on the plate B⁴. In this operation this lever, attached to the shuttle carrier or arm U by the pin W in the slot W', (Fig. 2) turns it on the axle or fulcrum P' (as seen in Fig. 13) till the "clasp or guide plate" A⁶ (Fig. 3) has moved upon the guide plate A⁷ to the position as seen in Fig. 4. The shuttle carrier, or arm U then remains stationary upon the axle P' (Fig. 13) and both are carried by motion of the lever directly upward till the hook punctures the cloth and reaches its highest point as seen in Fig. 2. In the meantime the revolution of the shaft B (Fig. 1) has operated the eccentric E which has raised the lever Y' upward carrying with it the spool and drawing upward and tight the slack thread. The same motion of the shaft has turned the cam U³ which has raised by its pressure against the set screw W² the sliding plate B which has raised and drawn back the feed bar C the footpiece I and the spring K the length of a stitch. This spring having been pressed in this backward motion against the point of the stationary arm L, has carried the thread drawn from the spool partly around and into the recess of the hook. By continuing the motion of the shaft, the end of lever Z⁴ to which is fastened the shuttle carrier is moved downward and in conjunction with the springs E⁵ and E⁶ carries with it the cross piece P and the shuttle carrier U and with this the shuttle and hook, down to the position in which they are represented in (Fig. 4). The lever Z⁴ continuing this motion turns the shuttle carrier U on the axle of the cross-piece P and by this motion the shuttle and hook are carried through the loop as represented in Fig. 3. In the meantime the eccentric E has raised the lever Y' with the spool A which has car-

ried with it upward the slack thread and the loop (through which the shuttle and hook have just passed) with the shuttle thread in it as represented in Fig. 3. The motion of the cam U³ has pressed the movable plate D downward which has moved the feed-bar G and its footpiece I with the material being sewed forward the length of a stitch. In like manner each stitch is made.

It is not my purpose to confine myself to any particular size or length in constructing the hook because it may be varied in these respects advantageously, according to the thickness of the material to be sewed. It should, however, be made sufficiently long that when operated it will reach through the cloth and catch the thread drawn from the spool. It should be constructed of the best quality of steel and smoothly polished.

I propose to make my shuttle of the materials commonly used for such purpose. It is not my purpose to confine myself to any particular size or length in constructing the shuttle or hook as these may be changed without materially altering the general character of the device or changing its results. In making the machine for use pains should be taken in the construction of every part of it that it shall perform its work as harmoniously and quietly as possible.

I do not claim the hook detached from the shuttle because I believe this has been made before; nor do I claim to have conceived the idea of making the rough or serrated foot-piece because serrated foot-pieces are now in common use. But

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

1. The spring thread-carrier K, in combination with the stationary arm L, and feeding mechanism operating together in the manner and for the purpose specified.

2. The combination of the shuttle R, and hook 7, fastened together, or their equivalents, operating substantially in the manner and for the purpose herein described.

3. The shuttle-carrier U, the case S, and the crosspiece P, when operating together substantially in the manner and for the purpose herein described.

AMOS W. SANGSTER. [L. s.]

Witnesses:

JAMES SANGSTER,
LEWIS J. CARPENTER,
NATHAN THAYER.