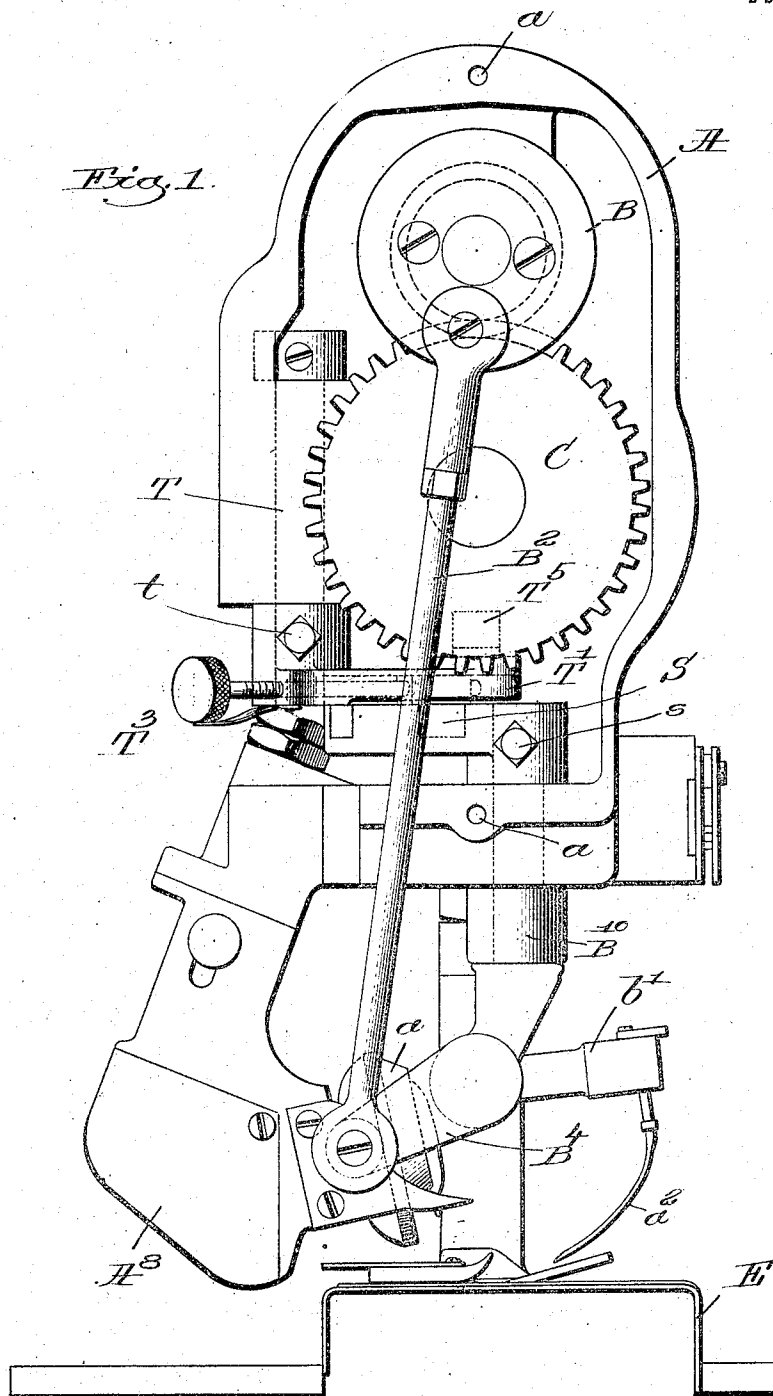


W. ARBETTER.
BLINDSTITCH SEWING MACHINE.
APPLICATION FILED FEB. 1, 1908.

937,273.

Patented Oct. 19, 1909.

2 SHEETS—SHEET 1



Witnesses:

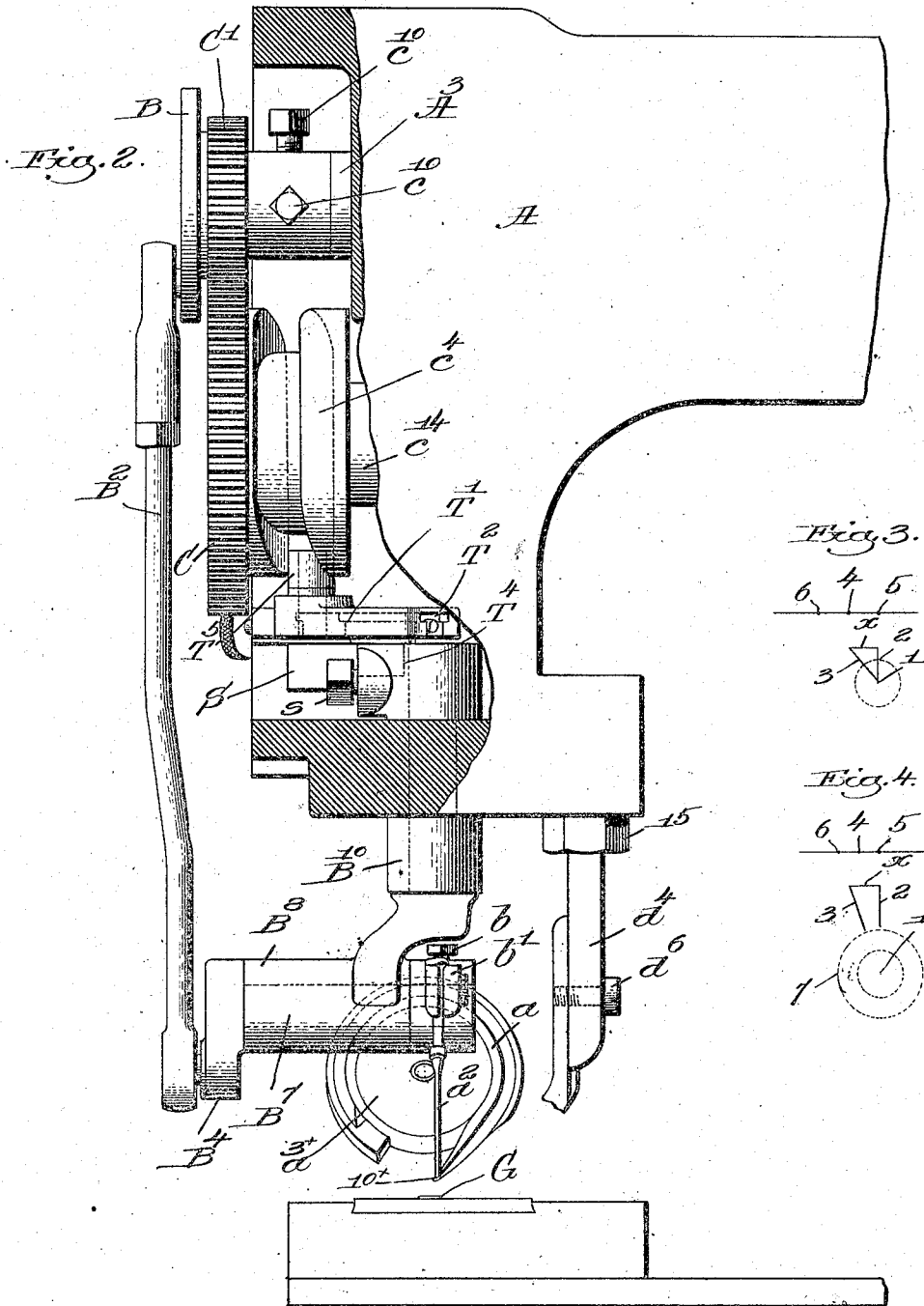
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Witnesses:
Fred S. Schubert
Joseph M. Ward

Inventor:
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By [Signature]

UNITED STATES PATENT OFFICE.

WOLF ARBETTER, OF CHELSEA, MASSACHUSETTS, ASSIGNOR TO ARBETTER FELLING MACHINE COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

BLINDSTITCH SEWING-MACHINE.

937,273.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed February 1, 1908. Serial No. 413,741.

To all whom it may concern:

Be it known that I, WOLF ARBETTER, a citizen of the United States, residing at Chelsea, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Blindstitch Sewing-Machines, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to a machine for making blind stitches, and is designed particularly for use in felling, padding and other similar sewing work in the manufacture of clothing. It is an improvement upon machines of the general type illustrated in patent to Arbetter No. 830,699, granted September 11, 1906.

The invention is more particularly concerned with the stitch-forming mechanism proper, and will be apparent from the accompanying description and drawings and be defined in the appended claims.

The drawings represent the upper or head portion of a sewing machine embodying the invention.

In the drawings, Figure 1 is a front elevation of the head of the sewing machine with the face-plate removed and showing a portion of the work-support; Fig. 2 is a side elevation partially in cross-section of the parts shown in Fig. 1; Figs. 3 and 4 are diagrammatic views to which reference will be made.

For the purposes of this invention it is unnecessary to illustrate or describe the portion of a sewing machine below the bed-plate, including the feeding mechanism, the means for driving the different mechanisms of the sewing machine, or in fact anything but the forward portion of the sewing machine head containing the stitch-forming mechanism proper and the parts immediately associated therewith.

In the drawings, A represents the head or forward end of the overhanging arm of the machine provided with a face-plate which is here shown as removed to expose the interior parts, and which is held in position by screws entering the holes *a*. In the type of machine illustrated a presser-foot supported from the presser-foot carrier *d*⁴ by the screw *d*⁵ is rigidly connected to the head A, being adjustable vertically by means of lock-nuts, one of which is shown at 15, all as set forth

in said patent. The work-support E, the bender G, the feeding mechanism (not shown) may all be of the type illustrated in the said patent, but as they are not made the subject of this invention it is unnecessary to describe them further.

The main driving shaft A² extends horizontally through the head and is provided at its forward end with a pinion C', adjustably connected thereto by the set-screws *c*¹⁰. On the face of the pinion C' is mounted a rotarily adjustable disk B to which is eccentrically connected the needle-operating rod B². A grooved cam *c*⁴ is mounted on a stub-shaft *c*¹⁴, and driven from the pinion C' by a gear C intermeshing therewith.

A vertical rock-shaft B¹⁰ is mounted in the lower portion of the head and carries at its lower end a long transverse bearing B⁸. A needle-carrying rock-shaft B⁷ is supported in said bearing, and provided at its outer end with a rock-arm B⁴, to which, by means of a ball and socket joint, the needle-operating rod B² already described is connected. The other end of the needle-carrying rock-shaft B⁷ carries fastened thereto by means of a set-screw *b* a needle-carrying arm *b*¹. At the outer end of the needle-carrying arm *b*¹ is mounted a curved needle *a*², whose curvature is substantially concentric with the axis of the shaft B⁷.

The vertical rock-shaft B¹⁰ has adjustably connected thereto at its upper end within the head by means of a set screw *s*, a slotted rocker-arm S. At the rear of the head A a short vertical rock-shaft T is mounted in a suitable bearing in the head and is provided at its lower end, adjustably connected thereto by a set-screw *t*, with a rocker-arm T'. The rocker-arm T' carries on its upper side a stud T⁶ which rides in the groove of the cam *c*⁴, and said arm is also slotted longitudinally and a sliding carrier T² is mounted in said slot and adjustable longitudinally therein by means of the screw T³. The carrier T² has pivotally mounted thereon a stud T⁴, which enters the slot of the rocker-arm S.

The details of that portion of the stitch-forming mechanism complementary to the needle it is unnecessary to describe. Such mechanism is herein shown as similar to that in the said patent, as comprising a framework A⁸, a revolving hook *a* and contained bobbin and case *a*^{3*} rotating in a plane transverse and oblique to the paths of oscillation

of the needle, and transverse and oblique to the work-support. The revolving hook may be operated from the main driving-shaft by the means described in the said patent.

5 It will be observed by reference to the drawings that the axis of the shaft B⁷ is shown as a considerable distance to the rear of the axis of the vertical rock-shaft B¹⁰, and that the axis of the rotary hook is shown at a distance to the left of the axis of the vertical rock-shaft B¹⁰, and this construction is an important part of the present invention. The machine of this invention is designed, as in the case of the one shown in the patent already referred to, to make two stitches, one in the direction of the feed of the material, and one at an angle thereto, the said stitches usually being made alternately, and in the case of felling work the straight stitch is taken into the foundation fabric parallel with, and close to the edge of the fold or superimposed layer, while the diagonal stitch enters the edge or under the edge of the upper layer and emerges from the upper surface of the said layer.

In order to secure speed and simplicity of operation of the parts it is desirable to have the axis of the revolving hook or other looper mechanism fixed in position, but capable of cooperating with the needle on both the straight and diagonal thrust to form the stitches. The smaller the angle between the paths of oscillation of the needle in making the straight and the diagonal stitch the more readily can the cooperation of the looper with the needle be secured. But it is necessary that the needle should penetrate a certain distance into the material in making the diagonal stitch in order to secure satisfactory work. This invention provides for securing the requisite penetration of the needle in making the diagonal stitch, and at the same time the minimum divergence of the needle from a straight line by disposition of the axes already described. By placing the axis of the rock-shaft B⁷ in the rear of the axis of the vertical rock-shaft B¹⁰ the needle will be swung bodily about the vertical axis of the shaft B¹⁰ and in a circle whose radius is that of the distance between the axes of the shafts B⁷ and B¹⁰. This distance will depend somewhat upon circumstances, but in ordinary work and in a machine of ordinary size it has been found that three-eighths of an inch is most satisfactory. The looper or rotating hook *a* should be placed with its axis substantially midway between the paths of oscillation of the needle—substantially because this distance between the paths is designed to be slightly adjustable—and the looper should be as close to the needle as is possible and yet avoid any danger from the hook catching in its own thread after feeding has taken place.

65 The advantages of the arrangement of the

axis described will perhaps better appear by observing Figs. 3 and 4 of the drawings, where 1 represents the axis of the vertical shaft B¹⁰, 2 the straight, and 3 the diagonal thrust of the needle, 4 the axis of the looper, 5 the point of engagement of the looper with the needle on the straight thrust, 6 the point of engagement of the looper with the needle on the diagonal thrust. In Fig. 3 the axis of the shaft B⁷ is represented as intersecting that of the shaft B¹⁰ at the point 1, and hence the needle has no bodily swinging movement but simply turns on the axis 1, and in this way in order to secure a given depth of penetration *x* or a given distance of emergence on the diagonal stitch from the straight stitch makes the maximum angle of divergence. This throws the points of cooperation with the looper 5 and 6 very far apart, thus making it extremely difficult to secure proper cooperation of the looper and needle. In Fig. 4, where the conditions are otherwise the same but the axis of the shaft B⁷ is rearward by three-eighths of an inch of the axis of the shaft B¹⁰, the needle has a bodily swinging movement on an arc of the circle 7, and hence in order to secure the same given depth of penetration *x* or a given distance of emergence on the diagonal stitch from the straight stitch, the angle between the straight and diagonal stitch is minimized and the points 5 and 6 brought so close together that when the axis 4 of the shuttle is arranged substantially midway therebetween a ready and proper cooperation of the looper with the needle is secured in the making of both stitches.

The screw T³ and connected parts already described enables an adjustment to be made of the angle between the straight and diagonal stitches for different kinds of work without disturbing the position of the needle in making the straight stitch which it is desired to maintain. This is secured by adjusting the arms T', S, on their respective rock-shafts so as to be in line when the needle is in position for making the straight stitch. Then when the screw T³ is moved to shift the position of the stud T⁴ and consequently the throw of the arm S, the position of the needle in making the diagonal stitch will alone be varied. By this means an accurate and positive adjustment is secured and the exact and definite return of the needle from the diagonal to the straight stitch and from the straight to the diagonal stitch is at all times secured. This mechanism, together with the positively operated cam C⁴, secures an exact and accurate operation of the needle in both of its paths of oscillation.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A sewing machine for blind stitching

comprising, in combination, a needle and means for oscillating the same, means for bodily swinging the needle to cause its oscillations to occur in diverging paths, the axis of said oscillating movement being located to the rear of the axis of its swinging movement.

2. A sewing machine for blind stitching comprising, in combination, a needle and means for oscillating the same, means for bodily swinging the needle to cause its oscillations to occur in diverging paths, the axis of said oscillating movement being located to the rear of the axis of its swinging movement, complementary stitch-forming mechanism including a looper moving transversely to the paths of oscillation of the needle, the central point of the said looper's movement being substantially midway the diverging paths of the needle.

3. A sewing machine for blind stitching comprising, in combination, a curved needle and means for oscillating the same, means for bodily swinging the needle to cause its oscillations to occur in diverging paths, the axis of said oscillating movement being located to the rear of the axis of its swinging movement.

4. A sewing machine for blind stitching comprising, in combination, a curved needle and means for oscillating the same, means for bodily swinging the needle to cause its oscillations to occur in diverging paths, the axis of said oscillating movement being located to the rear of the axis of its swinging movement, complementary stitch-forming mechanism including a looper moving transversely to the paths of oscillation of the

needle, the central point of the said looper's movement being substantially midway the diverging paths of the needle.

5. A sewing machine for blind stitching comprising, in combination, a vertical rock-shaft and means for rocking it, a needle-carrying rock-shaft supported by, and transversely of said vertical rock-shaft with its axis in the rear of that of the vertical rock-shaft, a curved needle mounted on said needle-carrying rock-shaft, and complementary stitch-forming mechanism cooperating therewith.

6. A sewing machine for blind stitching comprising, in combination, a vertical rock-shaft and means for rocking it, a needle-carrying rock-shaft supported by, and transversely of said vertical rock-shaft with its axis in the rear of that of the vertical rock-shaft, a curved needle mounted on said needle-carrying rock-shaft, and a rotary hook mounted to move in a plane transverse and oblique to the paths of the needle and with its axis of rotation substantially midway between said paths.

7. A sewing machine for blind stitching comprising, in combination, a curved needle and means for oscillating it, means for bodily swinging the needle transversely to its axis of oscillation and about a center in front of said axis.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

WOLF ARBETTER.

Witnesses:

MABEL PARTELOW,

THOMAS J. DRUMMOND.