No. 775,225. PATENTED NOV. 15, 1904.

O. R. VAN VECHTEN.

STITCH FORMING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED NOV. 21, 1898.

NO MODEL.

Fig. 1.

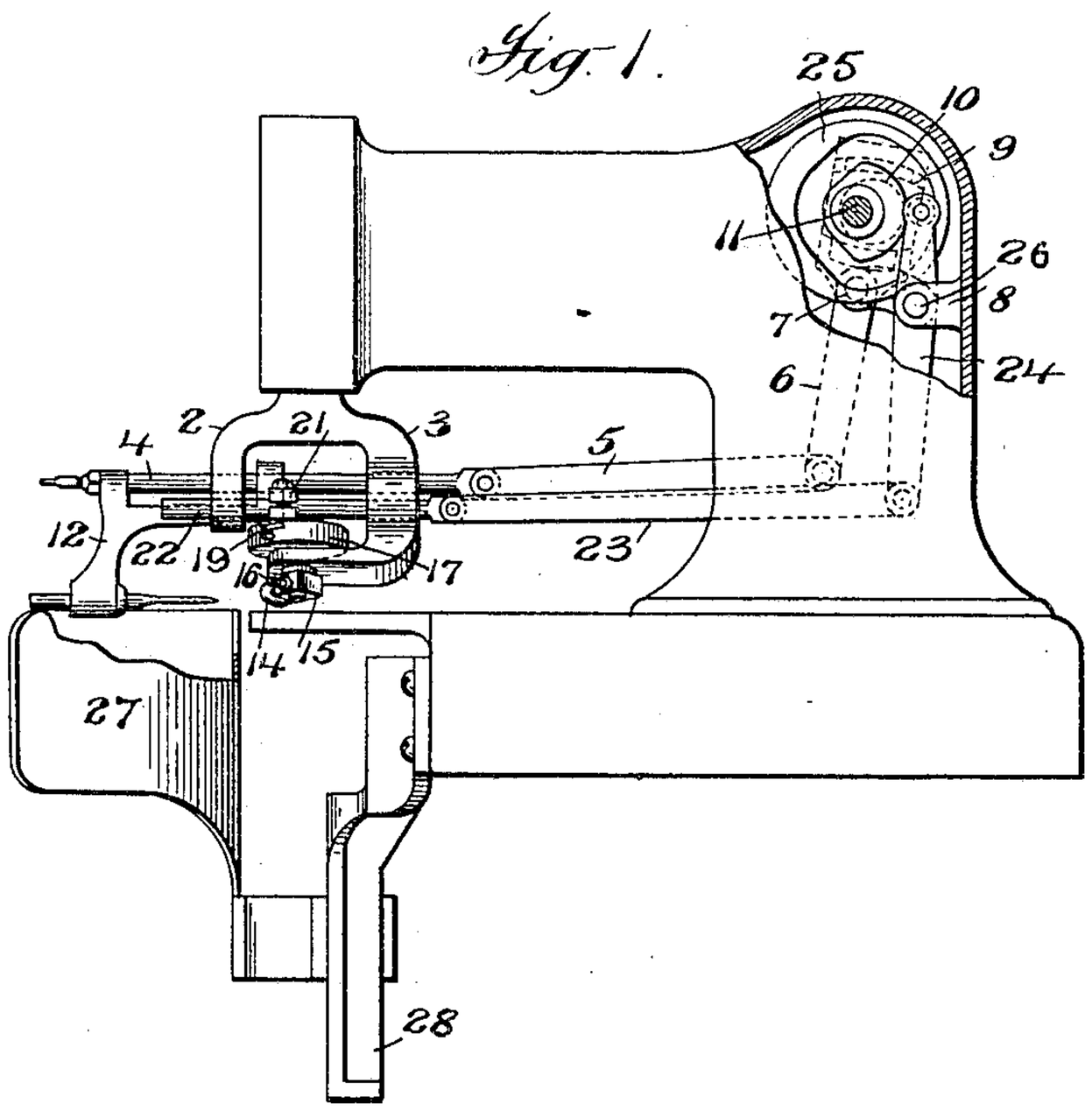


Fig. 2.

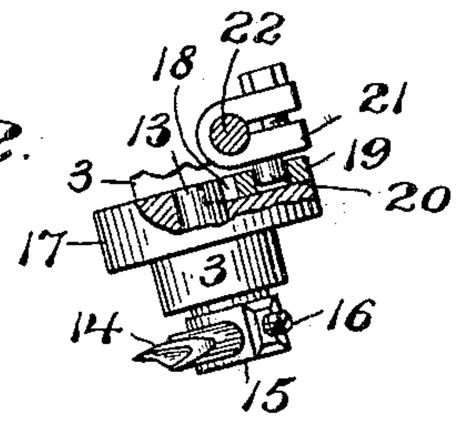
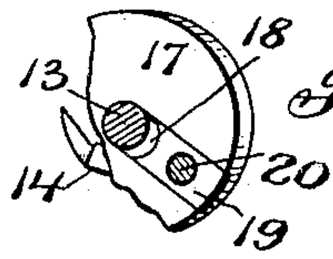


Fig 3



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No. 775,225. Patented November 15, 1904.

UNITED STATES PATENT OFFICE.

ORVILLE R. VAN VECHTEN, OF NEW YORK, N. Y., ASSIGNOR TO THE ECONOMIC SEWING MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

STITCH-FORMING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 775,225, dated November 15, 1904.

Application filed November 21, 1898. Serial No. 696,983. (No model.)

To all whom it may concern:

Be it known that I, ORVILLE R. VANVECHTEN, a citizen of the United States, residing in New York, county of Richmond, State of New York, have invented certain new and useful Improvements in Sewing-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in sewing-machines. It has for its object to produce an improved stitch-forming mechanism for sewing-machines in which the stitch-forming devices are so related to each other as to render the action of the taking of the loop by the stitch-forming device which coöperates with the needle sure and when the devices which form the stitch make what is known as a "chain-stitch" to insure the easy and accurate delivery of the loop.

With this and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, as will be hereinafter fully described and then specifically pointed out in the claims hereunto appended.

Referring to the accompanying drawings, Figure 1 is a side elevation, partly in section, of so much of a sewing-machine as is necessary to an understanding of the invention. Fig. 2 is a detail elevation, partly in section, showing the manner of mounting the looper mechanism. Fig. 3 is a detail plan view, partly in section, illustrating the looper mechanism.

Referring to the drawings which illustrate a preferred embodiment of the invention, the frame of the machine is of the usual form—that is to say, it has the usual arm overhanging the bed-plate. Depending from the lower forward end of the arm is a pair of downwardly-projecting brackets 2 3, which may be secured to the frame in any suitable manner. These brackets serve to support a needle-bar 4, which in the present instance reciprocates in a horizontal plane.

The needle-bar may be given its reciprocations by any desired mechanism. As shown, one end of the bar has pivoted thereto a link 5. The other end of this link is pivoted to a lever 6, said lever being in turn pivoted to a stud 7, mounted on a bracket 8, located in the interior of the frame. The upper end of the lever 6 is formed into a yoke 9, which is operated by an eccentric 10, which is mounted on the main shaft 11 of the machine. The means by which the needle-bar supports the needle may be of any desired construction. As shown the needle-bar is provided with a bracket 12, in which the needle is mounted.

While as before indicated the means whereby the needle is mounted and operated may be widely varied, the construction which has just been described is the preferred one, for the reason, among others, that it enables a straight needle to be used having a movement in a right line. When a curved needle which has its eye on the side is employed, the loop is thrown out on the side, and in order to successfully take such a loop by a coöperating stitch-forming device, such as a looper traveling in a curved path, it is necessary to time the parts so that the looper will meet the loop at the point of intersection of the two arcs—that is, the arc of travel of the needle and the arc of travel of the looper. If, however, the curved needle be sprung or bent, it will not properly take the loop. By using a straight needle the path of which is secant to the arc of travel of the looper a longer run of the needle with respect to the looper is secured and the looper is given much more time to take the loop. Furthermore, when the machine is arranged to make a chain-stitch and a curved needle is employed as much exactness is necessary when the looper is delivering its loop to the needle in making the second part of the stitch as when the needle is delivering the loop to the looper in making the first part of the stitch. Furthermore, when the stitch is being drawn tight the strain on a curved needle is directly across its curve and a strong pull on the thread will bend or spring the needle, whereas with a

straight needle the strain in drawing the stitch tight is lengthwise of the needle, and consequently as strong a pull as is necessary can be exerted on the thread in order to draw up the stitch.

The stitch-forming device which coöperates with the needle may be varied in character. As shown, however, it consists of a looper. Whatever be the form of this coöperating stitch-forming device, however, it is arranged so that when the path of the needle is contained in a horizontal plane the stitch-forming device is confined to move in a single plane which cuts the horizontal plane containing the path of movement of the needle at an acute angle, so that the action of the looper both in taking and delivering the loop is facilitated.

While the construction by which the looper is mounted and operated may be widely varied, as shown, the bracket 3 is inclined at a slight angle to the horizontal and has a perforation through it in which is mounted a looper-shaft 13, carrying a curved looper 14, which may be of any usual construction. This looper is mounted in a block 15, being held therein by any suitable means—as, for instance, by a set-screw 16. As shown, the upper end of the shaft is provided with a plate or disk 17, which has a radial groove 18, in which plays a sliding block 19. This block in the construction shown is engaged by a pin 20, which depends from a cam-block 21, this block being secured on a looper-operating bar 22, which is supported in the brackets 2 3, before referred to.

The means for operating the looper-operating bar may be of any desired description. As shown the inner end of the bar has connected to it a link 23, said link being pivoted to a lever 24. This lever 24 is pivoted at 26 in the bracket 8, before referred to, and the upper end of the lever is provided with a stud which engages a groove in a closed cam 25, mounted on the shaft 11, before described, this shaft being the main shaft.

In the preferred form of the construction the work will be supported at an angle to the bed-plate, the work-support in the present instance consisting of a curved guide 27, which is mounted on a bracket 28, depending from the machine-frame. The construction of the preferred form of this bracket is fully set forth in a patent granted to the Economic Sewing Machine Co. as my assignee, No. 563,630, dated July 10, 1900, to which reference is made for a fuller description thereof if the same be deemed necessary.

The description of the take-up mechanism, presser-foot, and feeding mechanism has been omitted from the present description as being unnecessary to an understanding of the present invention. While these parts may be of any approved construction, they will preferably be of the construction illustrated in the patent granted to the Economic Sewing Machine Company as my assignee October 30, 1900, No. 661,004.

While the construction which has been described embodies the preferred form of mechanism for carrying the invention into effect, it is to be understood that many changes may be made in the specific construction without departing from the invention. The invention is not, therefore, to be limited to the particular details of construction shown in the drawings and described in the foregoing specification.

What is claimed is—

1. In a sewing-machine, the combination with a needle and means for supporting and operating it, of a shaft, a coöperating stitch-forming device carried by the shaft, said shaft being so located that either a horizontal or a vertical line normal to the path of movement of the needle and intersecting the axis of the shaft will form with such axis an acute angle, and a line parallel to the line of reciprocation of the needle and intersecting the axis of the shaft will form with said axis a right angle, substantially as described.

2. In a sewing-machine, the combination with a needle and means for supporting and operating it, of a shaft, a looper carried by the shaft, said shaft being so located that either a horizontal or a vertical line normal to the path of movement of the needle and intersecting the axis of the shaft will form with such axis an acute angle, and a line parallel to the line of reciprocation of the needle and intersecting the axis of the shaft will form with said axis a right angle, substantially as described.

3. In a sewing-machine, the combination with a straight needle and means for supporting and operating it, of a shaft, a coöperating stitch-forming device carried by the shaft, said shaft being so located that either a horizontal or a vertical line cutting the path of movement of the needle at a right angle and intersecting the axis of the shaft will form with such axis an acute angle, and a line parallel to the line of reciprocation of the needle and intersecting the axis of the shaft will form with said axis a right angle, substantially as described.

4. In a sewing-machine, the combination with a straight needle and means for supporting and operating it, of a shaft, a looper on said shaft, said shaft being so located that either a horizontal or a vertical line cutting the path of movement of the needle at a right angle and intersecting the axis of the shaft will form with such axis an acute angle, and a line parallel to the line of reciprocation of the needle and intersecting the axis of the shaft will form with said axis a right angle, substantially as described.

5. In a sewing-machine, the combination with a bed-plate, of a needle and means for supporting and operating it, a shaft located above the bed-plate, a coöperating stitch-

forming device carried by the shaft, said shaft being so located that either a horizontal or a vertical line cutting the path of movement of the needle at a right angle and intersecting the axis of the shaft will form with such axis an acute angle and a line parallel to the line of reciprocation of the needle and intersecting the axis of the shaft will form with said axis a right angle, substantially as described.

6. In a sewing-machine, the combination with a bed-plate, of means for supporting the work at an angle to the bed-plate, a needle and mechanism for supporting and operating it, a shaft, coöperating stitch-forming devices carried by the shaft, said shaft being so located that either a horizontal or a vertical line cutting the path of movement of the needle at a right angle and intersecting the axis of the shaft will form with such axis an acute angle, and a line parallel to the line of reciprocation of the needle and intersecting the axis of the shaft will form with such axis a right angle, substantially as described.

7. In a sewing-machine, the combination with a bed-plate, of means for supporting the work at an angle to the bed-plate, a needle and mechanism for supporting and operating it, a shaft, a looper carried by the shaft, said shaft being so located that either a horizontal or a vertical line cutting the path of movement of the needle at a right angle and intersecting the axis of the shaft will form with such axis an acute angle and a line parallel to the line of reciprocation of the needle and intersecting the axis of the shaft will form with such axis a right angle, substantially as described.

8. In a stitch-forming mechanism, the combination with the needle, of coöperating stitch-forming devices confined to move in a single plane which cuts a horizontal plane containing the path of the movement of the needle at an acute angle, substantially as described.

9. In a stitch-forming mechanism, the combination with a needle, of a stitch-forming looper confined to move in a single plane which cuts a horizontal plane containing the path of movement of the needle at an acute angle, substantially as described.

10. In a stitch-forming mechanism, the combination with a needle, of a stitch-forming looper moving in a curved path, the path of the looper being contained in a plane which cuts a horizontal plane containing the path of movement of the needle at an acute angle, substantially as described.

11. In a stitch-forming mechanism, the combination with a needle, of an oscillating stitch-forming looper the path of movement of the looper lying in a plane which cuts a horizontal plane containing the path of the needle at an acute angle, substantially as described.

12. In a stitch-forming mechanism, the combination with a needle and means for supporting and operating it, of a shaft, and a coöperating stitch-forming device carried by said shaft and confined to move in a single plane, said shaft standing at an acute angle to a horizontal plane containing the path of the needle, substantially as described.

13. In a stitch-forming mechanism, the combination with a needle and means for supporting and operating it, of a shaft, and a stitch-forming looper mounted on the shaft and confined to move in a single plane, said shaft standing at an acute angle to a horizontal plane containing the path of the needle, substantially as described.

14. In a stitch-forming mechanism, the combination with a needle and means for supporting and operating it, of a shaft standing at an angle to a horizontal plane containing the path of movement of the needle, a stitch-forming mechanism carried by the shaft and confined to move in a single plane, and means for giving the shaft an oscillatory movement about its axis in the stitch-forming operation, substantially as described.

15. In a stitch-forming mechanism, the combination with a needle, of a shaft standing at an angle to a horizontal plane containing the path of movement of the needle, a stitch-forming looper mounted on the shaft and confined to move in a single plane, and means for giving the shaft an oscillatory movement about its axis to cause the looper to take the loop, substantially as described.

16. In a sewing-machine, the combination with the bed-plate, of a reciprocating needle and means for supporting and operating it, and coöperating stitch-forming devices confined to move in a single plane which cuts at an acute angle a plane parallel to the bed and containing the path of the needle, substantially as described.

17. In a sewing-machine, the combination with the bed-plate, of a reciprocating needle and means for supporting and operating it, and a looper confined to move in a single plane which cuts at an acute angle a plane parallel to the bed and containing the path of the needle, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ORVILLE R. VAN VECHTEN.

Witnesses:

T. F. KEHOE,

A. L. KENT.