

(No Model.)

3 Sheets—Sheet 2.

L. MUTHER & R. G. WOODWARD.
SEWING MACHINE.

No. 299,569.

Patented June 3, 1884.

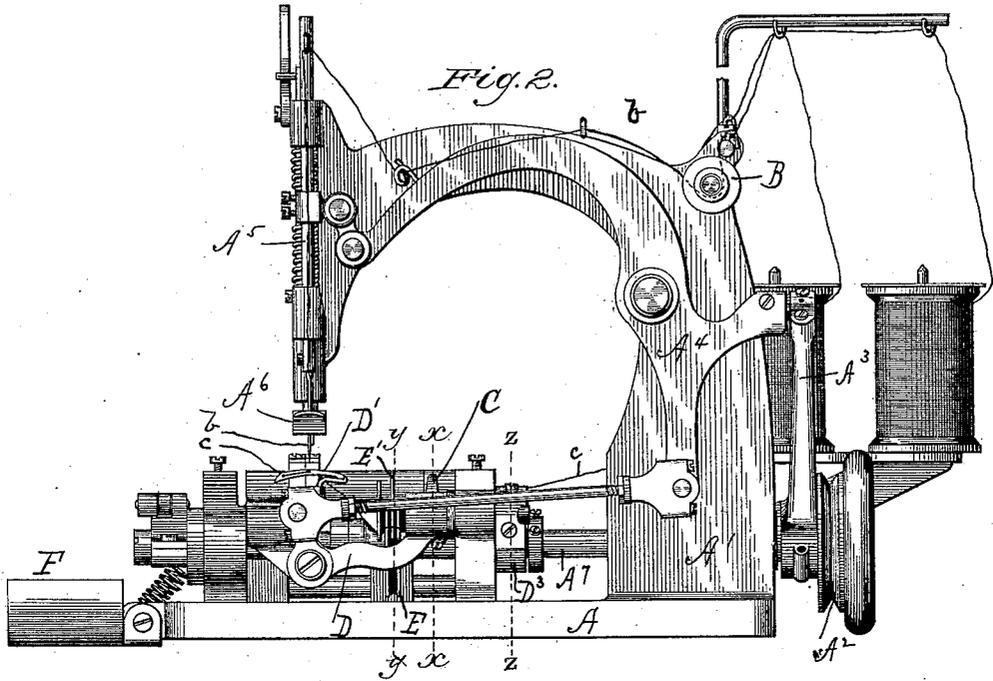


Fig. 2.

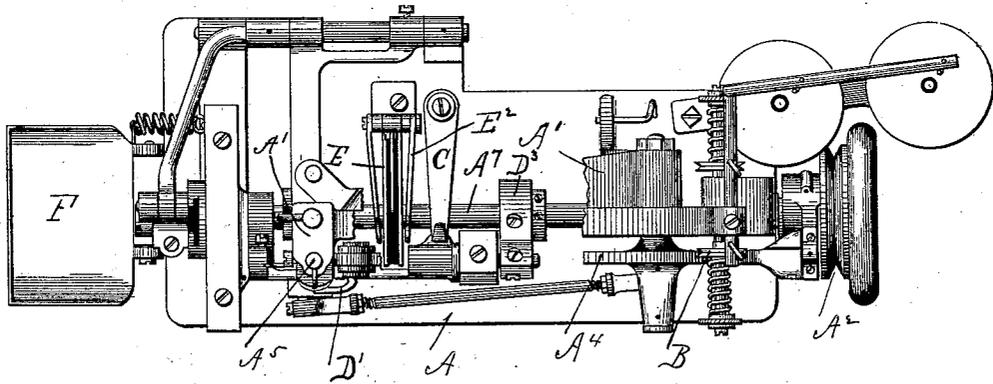


Fig. 3.

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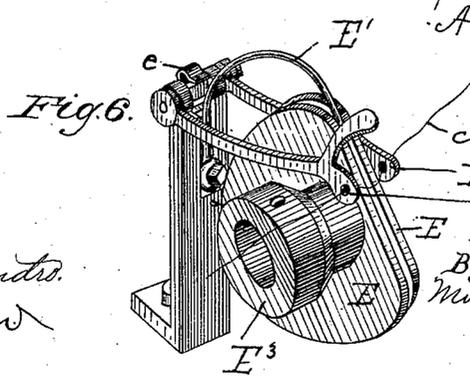
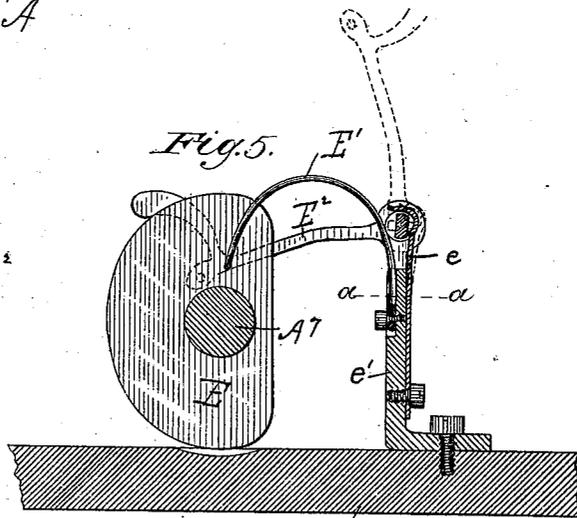
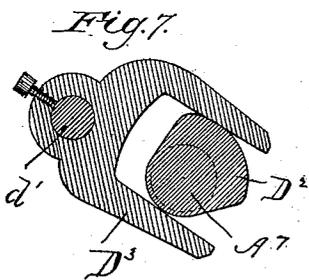
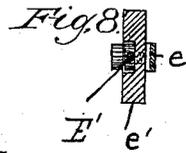
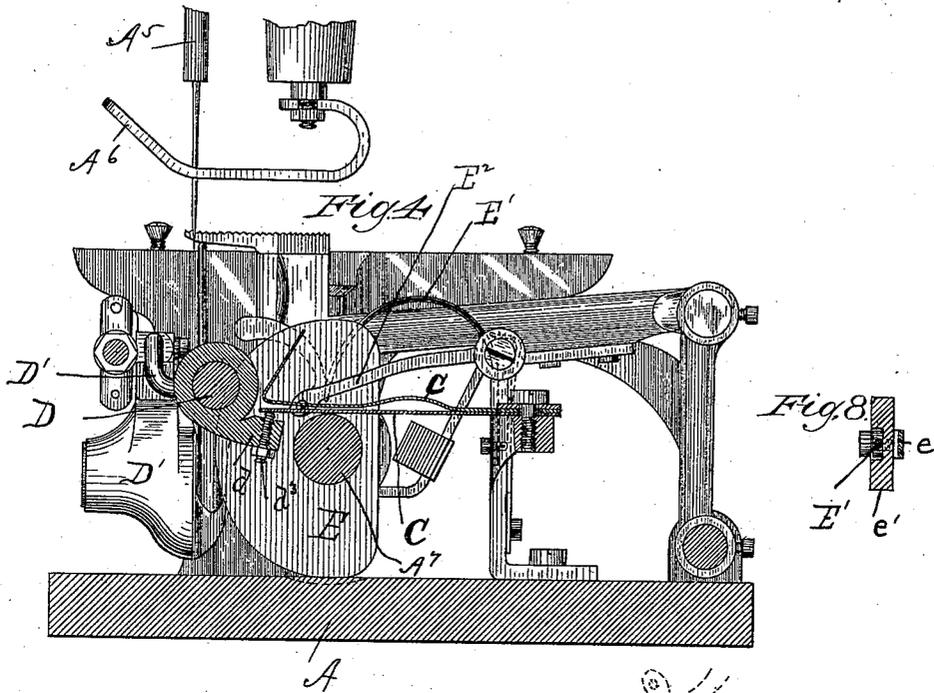
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UNITED STATES PATENT OFFICE.

LORENZ MUTHER AND RUSSELL G. WOODWARD, OF CHICAGO, ILLINOIS,
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SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 299,569, dated June 3, 1884.

Application filed May 14, 1883. (No model.)

To all whom it may concern:

Be it known that we, LORENZ MUTHER and RUSSELL G. WOODWARD, citizens of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Sewing-Machines, of which the following is a specification.

This invention relates to the devices for controlling the lower thread in double-chain-stitch sewing-machines, and is specially applicable to those machines in which knit and other elastic fabrics are sewed.

It has been customary heretofore to employ in this class of sewing-machines a vibrating spring-arm to take up the slack in the lower thread, caused by the receding movement of the looper. Such spring take-up devices act well under certain circumstances; but they do not give the thread sufficient freedom for the formation of the elastic stitch desired in elastic fabric work, nor do they act with the rapidity sometimes requisite. The object of the invention is to obtain this freedom of the thread for elastic work, and the rapidity of movement which will permit the running of the machine at a high rate of speed.

The first feature of our invention consists in combining with the looper a take-up device which is positively actuated, and which acts with certainty to engage the slack in the thread at each vibration of the looper, whereby we are enabled to operate the machine at high speeds.

Another feature consists in the combination, with the looper, of a positive take-up device, and an intermittent device acting to stop the feed of the fresh thread during the operations of such take-up, and to compel the take-up to engage the slack already existing, whereby the thread is positively controlled, except during the forward movements of the looper, at which times it may be left wholly or substantially free of tension, and the elastic character of stitch be obtained.

The invention further consists in certain novel combinations and details of construction, hereinafter set forth and claimed.

The drawings which form a part of this specification, and in which similar letters of

reference indicate like parts, show at Figure 1 a perspective view of a sewing-machine embodying our invention. Fig. 2 is a side elevation, and Fig. 3 a plan, of the same. Fig. 4 is a transverse section on line *xx* of Fig. 2. Fig. 5 is a section on line *yy* of Fig. 2. Fig. 6 is a perspective view of the take-up mechanism detached. Fig. 7 is an enlarged section showing the cam for oscillating the looper in one direction, and is taken upon the line *zz* of Fig. 2; and Fig. 8 is a section of a portion of the take-up device upon the line *aa* of Fig. 5.

In the drawings, A represents the bed; A', the standard; A², the drive-pulley; A³, the pitman actuating the needle-arm A⁴; A⁵, the needle-bar, and A⁶ the presser-foot.

B is the ordinary tension device acting upon the needle or upper thread, *b*.

c is the under thread, which may be used either with tension-exerting devices in connection with the novel devices hereinafter set forth for controlling it; or the latter devices may be alone relied upon. It passes from the spool first through the stop device, thence to the take-up, and from there to the looper.

The stop device is composed of an upper and a lower spring, C C, which are brought together to clasp the thread passing between them at the proper intervals, by contact of the under spring with the projecting point *d* upon the oscillatory or rocking frame D of the looper, said frame having its oscillatory motion communicated to it by a cam, D², on the main shaft A⁷ and a U-shaped arm, D³, on the end of the rocking-frame pivot. The bearings upon which the frame rocks are at *d'* *d'*. In order that the pressure of the springs upon the thread may be regulated, a screw, *d*⁴, is inserted in the point *d*, and the end of said screw is made to form the bearing-point of the projection. When the point *d* is withdrawn from under the springs, the latter automatically open and free the thread, which can then be drawn by the looper without resistance. If the looper be operated otherwise than as shown, it may be necessary to provide some other device for shutting the springs than the projecting point on the looper-frame. Any device acting to close them at the proper time may be substi-

tuted for such oscillating point with the same result, as is obvious; and hence we do not wish to be limited in that regard.

The take-up consists of two rotating cam-shaped disks, E E, upon the main shaft, and a stationary throw-off, E', the thread being compelled to ride over the edges of the disks by the guides E², located at either side thereof and within the circle described by the outer edges of the disks. In the rotation of the disks, the straight edges thereof catch the portion of thread between the guides and carry it up with them (thereby taking up the slack from the looper) until the throw-off releases it, at which time the looper is ready for another forward impulse, and not only draws the slack thus temporarily taken care of by the take-up, but a stitch-length in addition. This take-up is unfailling in its operation; and it will be noticed that the thread passes it in line with its axis. Of course, a single disk, E, may be used in place of the two disks; but two are to be preferred, as thereby the point of the throw-off is covered, and the thread is prevented from getting under the same. The take-up is otherwise excellently adapted to keep the thread from entanglement with any part of the machine, and the speed of the machine may be increased to a very high figure without danger in this regard. As a convenient feature of construction, the disks may be made in one piece with a collar, E³, and secured to the shaft thereby.

The guides are held down to their work by a spring, e, and being pivoted they may be raised to the position indicated by dotted lines in Fig. 5, for convenience in threading. The throw-off arm and likewise the guides and their spring are secured to an upright, e', attached to the bed of the machine.

F is a cap employed to cover some of the moving parts at the front of the machine.

The devices shown for actuating the feed of the cloth are not herein described, as they are

not of our joint invention; and for the same reason we do not herein claim the peculiarly-moving looper, nor its actuating devices, save in so far as they may be elements available in the combinations hereinafter particularly pointed out and claimed.

Our invention permits the formation of a very elastic stitch in the article sewed, and is therefore specially adapted to the sewing of knit and similar fabrics.

We are aware that the use of take-up devices and stops in combination therewith for controlling the upper thread in sewing-machines is not new, and we therefore lay no claim, broadly, to such devices.

We claim—

1. In a double-chain-stitch sewing-machine, the combination, with the stitch-forming mechanism, of a tension device acting upon the upper thread, and an intermittently-operating stop and take-up acting upon the lower thread, substantially as specified.

2. As an improvement in take-up devices for sewing-machines, the combination of a cam-disk arranged with its periphery in contact with the thread, mechanism whereby said cam is rotated in proper relation to the action of the stitch-forming mechanism, and a throw-off arm extending within the line of rotation of the cam's periphery, the whole operating substantially as set forth.

3. As an improvement in take-up devices for sewing-machines, the combination of a cam-disk and mechanism for rotating the same, with thread-guides arranged on each side of said cam and having eyes for the passage of the thread, said eyes being located within the outer periphery of the cam, substantially as and for the purposes set forth.

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