

G. E. WARREN.
SHOE SEWING MACHINE.
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1,007,905.

Patented Nov. 7, 1911.

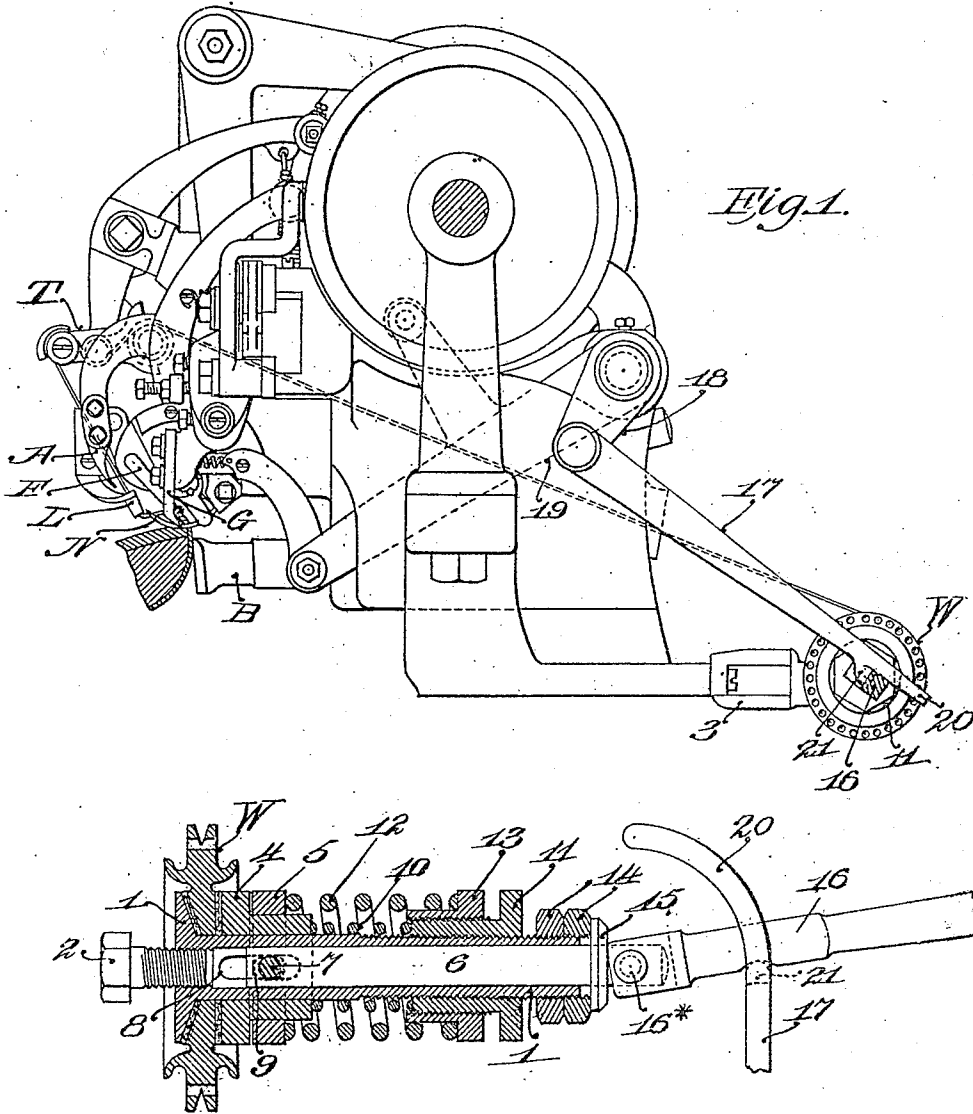


Fig. 2.

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UNITED STATES PATENT OFFICE.

GEORGE E. WARREN, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MANUFACTURING COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SHOE-SEWING MACHINE.

1,007,905.

Specification of Letters Patent.

Patented Nov. 7, 1911.

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To all whom it may concern:

Be it known that I, GEORGE E. WARREN, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Shoe-Sewing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to an improvement in sewing machines; and more particularly to sewing machines of the curved-hook needle, wax-thread, chain-stitch type known as welt and turn sewing machines.

In the Dancel sewing machine illustrated with substantial accuracy in Letters Patent No. 190,709, granted May 15, 1877, the entire duty of pulling the thread into the materials and drawing from the supply through the tension sufficient thread for the next stitch was imposed upon the needle. The needle was required to form the stitch, to tighten it, to pull it into its final position in the work, and to pull off from the supply thread for the next stitch. In the operation of the Dancel machine the needle penetrated the work, was looped by the looper and retracted, pulling a loop of thread through the materials and through the loose loop of thread standing on its shank. When the loop last drawn out by the needle was engaged with the loop which had stood around the shank of the needle, the old loop, as such loop is commonly called, was further drawn upon by the needle until all the slack was taken out, the stitch of which said loop formed a part tightened and the preceding stitch set, the needle then pulled thread from the thread supply for the next stitch. This mode of operation involved two serious difficulties well known to those skilled in this art, namely, the cutting action of the thread upon the between substance and the breaking of the thread in the hook of the needle owing to the so-called "seesawing" action of the thread in reeving back and forward through the needle hook. Another objection to the mode of operation of the Dancel machine resided in the variation of the amount of slack thread left in the old loop which was due to changes in the thickness of the stock and to the action of the spring-

controlled take-up used in this machine to secure certainty of action of the looper, and which often had force enough to pull some thread at times from the old loop. These defects of the Dancel machine were overcome for most commercial uses of such a machine by the improvements of the French and Meyer Patent No. 412,704, October 8, 1889, which consisted in providing the Dancel machine with a cam-actuated thread finger and a cam-actuated take-up, the latter operating to set the stitch while the needle is forward by pulling upon the loop of thread standing around the shank of the needle, and the former operating to hold a bight of thread in the supply to see the needle through the work, thus preventing to a large extent the reeving of the thread through the hook of the needle, entirely eliminating the "seesawing" action of the thread in the hook of the needle, and making the old loop of uniform length. In the machine of this patent, which is known as the Goodyear welt and turn machine, the needle while in the materials acts as a stop or abutment around which the thread is pulled to set the preceding stitch, and the cutting action of the thread upon the materials is transferred from the between substance (where it occurred in the Dancel machine) to the upper, the greatest cutting effect being at or near the needle hole next preceding the one through which the needle is inserted. This cutting action of the thread on the upper impairs the utility of this machine when used in certain classes of work, such, for example, as felt shoes, where the upper is less capable of withstanding the strain than the between-substance, or where it may be specially desirable to prevent any cutting action of the thread on the upper.

The object of the present invention is to modify the operation of the Goodyear machine so that, while retaining as many as possible of its advantages, the cutting action of the thread upon the upper is avoided.

To these ends the present invention consists in the devices and combinations of devices hereinafter described and claimed.

In the accompanying drawings the invention is shown as embodied in a machine like the Goodyear welt and turn machine modified in accordance with the present invention, in which—

Figure 1 is a side elevation of the machine

and Fig. 2 is a sectional view of the tension device removed.

The illustrated embodiment of the present invention is described as follows:—The needle N, looper L, thread finger F, channel guide G, awl A, take-up T, and back-rest B are all constructed and operated substantially as in said Goodyear machine, and for details of construction reference may be had to the said patent to French and Meyer. The tension wheel W is provided with two springs which act to exert frictional resistance to the rotation thereof, and automatic devices are provided by means of which the action of one of the springs upon the tension wheel may be released. The stud 1 consists of a hollow sleeve 1 which comprises the support for the tension device and is secured by means of the bolt 2 to the bracket 3 in the usual manner. This stud 1 has a friction surface corresponding with a friction surface upon the tension wheel W, between which surfaces is provided a felt washer. Upon the other side of the thread truck is provided a second friction surface, and a felt washer is pressed thereagainst by the friction surface of the flange of a sleeve 4 mounted upon the stud 1 but held from rotation therewith. The sleeve 4 is embraced by a ring 5 through which the force of the heavier spring, hereinafter referred to, is transmitted to the sleeve 4. A rod 6 is provided which is received within the hollow center of the stud 1, by means of which the ring 5 may be pulled back to withdraw the pressure of the spring upon the sleeve 4. Connection between the rod 6 and the ring 5 is obtained by means of a pin 7 which is passed through holes in the rod 6, stud 1, sleeve 4 and the ring 5. The hole in the rod 6 which receives the pin 7 is circular, and the pin fits said hole. The holes in the stud 1, indicated by the reference character 8, which receive the pin 7, are elongated as shown so that reciprocating movements of the rod 6 are permitted relatively to the stud 1. The holes in the sleeve 4 indicated by the dotted lines 9, are elongated slightly so that a slight longitudinal movement of the rod 6 will permit the pin 7 to be moved without movement of the sleeve 4, that is, without withdrawing it from contact with the tension wheel, while a greater movement will cause the pin 7 to engage the end of the said hole and to retract the sleeve 4 and operate thereby to release the tension wheel. The pin 7 fits the holes provided for it in the ring 5 so that a slight longitudinal movement of the rod 6 will withdraw the ring 5 from contact with the flange on the sleeve 4. A lighter spring 10 bearing at one end upon the end of the sleeve 4 and at the other end upon the end of an adjusting sleeve 11, provides pressure to cause a certain resistance to rotation of the tension wheel W. The

sleeve 11 is screwed upon the outside of the stud 1 so that the compression of the spring 10, and therefore the tension resistance is regulable. A heavier spring 12 is also provided which bears at one end upon the ring 5, and at the other end upon the adjusting sleeve 13 which is screw threaded upon the outside of the sleeve 11, so that it also may be adjusted to vary the tension exerted by the spring 12 upon the tension wheel W. At the end of the stud 1 two lock nuts 14 are provided which support the washer 15 in adjusted position. A lever 16 pivoted at 16* in the end of the rod 6 affords means for moving the rod 6 longitudinally of the stud 1. Thus when the lever 16 is turned to the position indicated in Fig. 2, the corner of the lever finds support upon the washer 15, and moves the rod 6 longitudinally to the right, thereby causing the pin 7 to withdraw the ring 5 from contact with the flange of the sleeve 4, and thereby removing the tension of the spring 12 from the tension wheel. When the lever 16 is permitted to assume its normal position, it releases the spring 12 and permits it to exert its tension resistance upon the tension wheel. The means for operating the lever 16 comprise a strut 17 and an arm 18 conveniently mounted upon the hub of the needle lever 19. The above described arrangement is such that when the needle advances and pierces the material, the arm 18 moves to the right as seen in Fig. 1, thereby pressing the strut rearwardly and swinging the lever 16 into the position indicated in Fig. 2, whereby the resistance to the rotation of the tension wheel W due to the pressure of the spring 12 is removed, and, as a result, thereby relieving the tension during the time the needle is advancing, which is during the time the take-up is acting to shorten the loop of thread standing around the shank of the needle. The strut 17 is provided with a bent end 20 which rests upon the upper side of the lever 16, and with a tooth 21 which engages the side of the lever 16, being received conveniently in the notch or recess cut therein for the purpose. This affords provision for throwing the tension entirely off when it is desired to remove the work from the machine. Thus by moving the lever 16 with the hand rearwardly a further distance beyond that shown in Fig. 2, and while it still affords a support for the end 20 of the strut 17, it moves the rod 6 far enough toward the right to cause the pin 7 to engage the end of the slot 9 in the sleeve 4 whereby the sleeve 4 is moved away from the tension wheel and the latter is released. Then when the lever 16 is again drawn forward, it again resumes its operative relation with the strut 17.

The operation of the machine of the present invention is as follows:—Assuming that

the parts have been forming several stitches and are operating normally, let us begin with the retracting movement of the needle. As the needle retracts, drawing a loop of thread through the materials and through the previously formed loop, the needle lever 19 rises, and through the means described the tension exerted by the spring 12 upon the tension wheel is restored. The retracting stroke of the needle, therefore, occurs at a time when the tension is the proper amount to secure the tightening of the loop standing around the drawn-back loop held by the needle, and to secure the pulling of the thread into the channel. Then the feed movement takes place and the needle again advances through the next needle hole. As the needle advances, the needle lever 19 falls and the strut 17 is pressed rearwardly thereby to relieve the tension wheel of the tension due to the pressure of the spring 12 thereon. The upward stroke of the take-up is taking place at this time and sufficient tension is exerted by the lighter spring 10 upon the tension wheel to keep the thread straight and to allow the take-up to exert substantially all the slack in the loop standing around the shank of the needle, preferably leaving it snugly drawn against the shank of the needle, but not with sufficient strain to set the preceding stitch. This insures a uniform measured amount of thread in the old loop. In this connection it is to be noted that while the applicant regards the best embodiment of his invention to require the provision of means for releasing the tension during the operation of the take-up because this insures the mode of operation above described and the attendant advantages recited, still he conceives himself to be the first to combine a take-up acting to draw the loop of thread snugly around the shank of the needle without exerting a stitch setting strain upon the thread irrespective of whether this is accomplished by releasing the tension at this time or not.

It will be observed that, while in the machine of the present invention the stitch is set by the needle, broadly considered, in the same manner as it was set by the Dancel machine, it also has many of the advantages incident to the French and Meyer machine, that is to say, the thread is pulled from the supply by an instrumentality separate from the needle, there is always a measured amount of thread in the old loop, which amount is practically a minimum, and the needle in its retracting movement draws out a loop of thread with no "seesawing" action.

The present machine differs in operation from the French and Meyer machine in that by releasing the tension while the take-up is acting the thread is pulled from the sup-

ply without strain, and any injurious cutting action of the thread upon the upper is prevented, which for certain classes of work, particularly in sewing felt shoes, makes it superior to that machine.

The present invention is not limited to the embodiment thereof herein illustrated and specifically described but is susceptible of embodiment in other and widely different forms.

What is claimed is:—

1. A chain-stitch sewing machine, having, in combination, a hook needle, a looper, a thread finger, a loop shortening take-up, a tension device and means for actuating the parts having provision to decrease the tension during the loop shortening operation of the take-up, substantially as described.

2. A chain-stitch sewing machine, having, in combination, a hook needle, a looper, a loop shortening take-up, a tension device and means for actuating the parts having provision to cause the take-up to draw the loop of thread standing around the shank of the needle snugly against the same and to cause the tension device to decrease the tension to prevent the take-up from exerting a stitch setting strain on the thread, substantially as described.

3. A chain-stitch sewing machine, having, in combination, stitch-forming instrumentalities including a loop-shortening and thread-pulling take-up, a tension, means for releasing the tension, and means for actuating the parts having provision to cause the release of the tension to occur during the loop-shortening operation of the take-up and while the thread is being drawn from the tension by the take-up, substantially as described.

4. A chain-stitch sewing machine, having, in combination, a needle, a looper, a tension, a take-up and means for actuating the parts having provision to cause the take-up to exert a strain on the thread less than a stitch setting strain but sufficient to draw the loop of thread snugly around the shank of the needle, substantially as described.

5. A chain-stitch sewing machine, having in combination, stitch-forming instrumentalities including a needle and a take-up, a tension, means for releasing the tension and means for actuating the parts to cause the release of the tension while the thread is being drawn therefrom by the take-up, and its application again before the completion of the retracting stroke of the needle to enable the needle to set the stitch against the tension, substantially as described.

6. A chain-stitch shoe sewing machine, having, in combination, stitch-forming instrumentalities including a needle, a thread finger, a tension, a take-up, means for releasing and applying the tension and actuating mechanism for the parts having pro-

visions, (1), to cause the take-up to draw the thread around the shank of the needle and thereafter pull off thread from the tension, (2), to cause the release of the tension to prevent the thread being drawn by the take-up against the shank of the needle to the full tension strain, and, (3), to cause the tension to be again applied before the completion of the retracting stroke of the needle

to enable the needle to set the stitch, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

GEORGE E. WARREN.

Witnesses:

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BENJAMIN PHILLIPS.