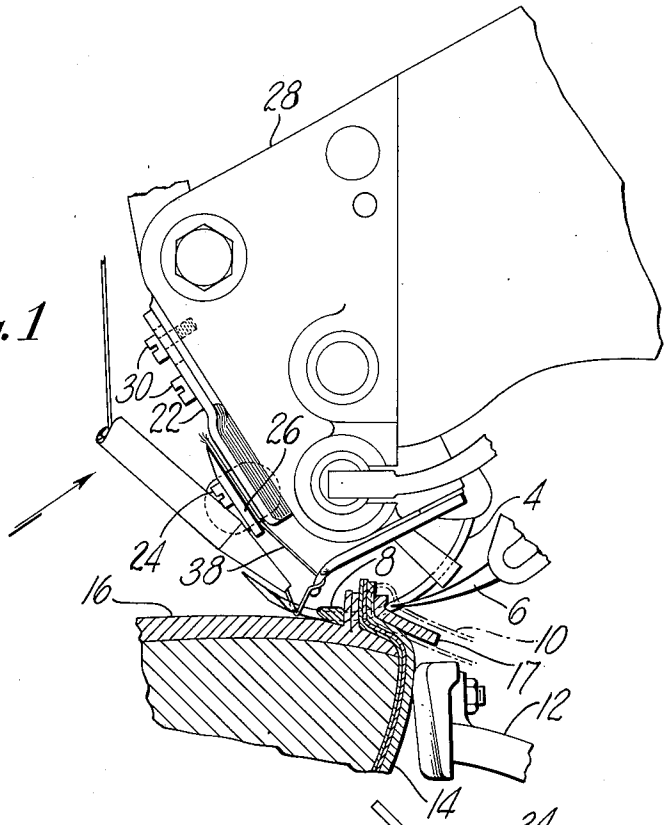
Sept. 13, 1955 O. R. HAAS 2,717,568

THREAD HOLDING DEVICES FOR SEWING MACHINES

Filed Oct. 30, 1952

Fig. 1



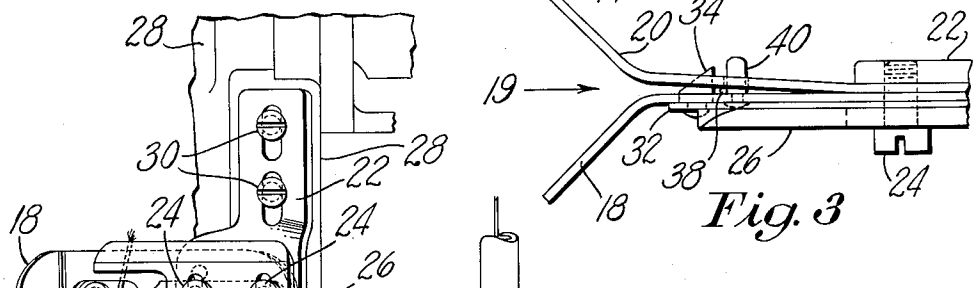


Fig. 3

Fig. 2

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THREAD HOLDING DEVICES FOR SEWING MACHINES

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5 Claims. (Cl. 112—253)

The present invention relates to shoe inseam sewing machines and more particularly to improvements in thread holding devices similar to those disclosed in United States Letters Patent No. 1,396,066, granted November 8, 1921, on application of Thomas H. Seely, and No. 2,200,402, granted May 14, 1940, upon application of Victor J. Tetrault.

The machines of the patents are provided with thread holding and cutting devices. A device of this nature is mounted close to the operating point in a sewing machine, so that a completely sewn shoe with thread attached may be moved laterally toward a holder to engage the thread therewith and thereafter the thread may be engaged with a cutter to sever it beyond the holder, leaving the thread end gripped in the machine close to the operating point. In starting a new seam the thread end is intended to remain in the grip of the holder until sufficient tension is applied thereto by the stitch forming devices to draw the end close to the point of sewing operations, leaving only a short length protruding from the first stitch. If the thread is improperly presented to the holder, the end will not be retained during formation of the first stitch with sufficient security to prevent it from being pulled entirely through the work. As a result, one or more stitches will be incompletely formed.

An object of the present invention is to provide a thread holding and cutting device for a shoe inseam sewing machine, by means of which the thread may be retained securely in place a sufficient length of time during the formation of the first stitch in a seam to avoid pulling the thread end through the work. Another object is to improve the operation of a thread holding and cutting device for a sewing machine which will operate more reliably than heretofore without the necessity of special attention and effort on the part of the operator in presenting the thread to the device at the end of a seam preparatory to starting a new one. As hereinafter described, the holding device is provided with opposed gripping jaws pressed yieldingly together and disposed with flaring spaced ends forming a throat to admit lateral entry of the sewing thread at the end of the seam, and means for retaining the thread against premature displacement from the jaws, of the thread end disposed between them in such a way that the thread, while being readily admitted, cannot escape except upon lengthwise frictional movement from between the jaws. With such construction, the yielding pressure of the jaws toward each other may be adjusted to satisfy the requirements for effective insertion of the first stitch in a new seam with the assurance that the tension will not be interrupted until formation of that stitch is completed.

This and other features of the invention as hereinafter described and claimed consists in certain devices, combinations and arrangements of parts, the advantages of which will readily be understood from the following detailed specification taken in connection with the accompanying drawings, in which:

Fig. 1 is a view in right-hand side elevation, partly in section, of the forward portion of a shoe inseam sewing machine embodying the features of the present invention, showing the parts in positions assumed in starting a new seam;

Fig. 2 is a detail view in front elevation of the thread holding and cutting device, the looper, the needle and a portion of a shoe being operated upon as illustrated in Fig. 1; and

Fig. 3 is a detail view in side elevation on an enlarged scale of the thread holder in the device, illustrating the position of the thread engaged thereby.

The machine illustrated in the drawings, except as hereinafter described, is the same as that of United States Letters Patent No. 1,108,560, granted August 25, 1914, upon application of Andrew Eppler, and No. 1,971,575, granted August 28, 1934, upon application of Alfred R. Morrill. The illustrated machine has a curved hook needle **4**, a curved awl **6**, a channel guide **8**, a welt guide **10**, a back rest **12** and other stitch forming devices more fully described in the patents. These devices operate to insert a chain stitch inseam connecting an upper **14**, a ribbed insole **16**, and usually a welt **17**. After completion of the inseam the shoe being operated upon is released from the sewing point and is withdrawn to the left to cause thread to be measured between the shoe and the looper sufficient in length to enable a new seam to be started without difficulty.

The machines of the Seely and Tetrault patents are provided with devices including a pair of gripping jaws forming a holder for the thread with flaring spaced ends acting as a throat to admit lateral entry of the sewing thread extending between a withdrawn sewn shoe and the looper. After entry of the thread between the gripping jaws, it is engaged with a cutter knife for severing it to free the shoe from the machine. The end of the thread running from the looper is expected to remain gripped between the jaws until a sewing operation is started on a new shoe, the severed end being retracted from the jaws during the formation of the first stitch or two by the machine. The thread holder of the prior patents is effective for the purposes intended except when insufficient entry of the thread between the jaws allows it to become disengaged by lateral movement before the first stitch in a shoe is completed. When this occurs there is a likelihood that the thread will be drawn into the work by the needle and then retracted completely from the work leaving an empty needle hole. During the subsequent operation of the machine, the looper may lay the thread again in the hook of the needle so that the seam will eventually be started but frequently this does not occur until several sewing cycles have been completed. Thus, there will be a number of improperly inserted stitches and the first stitch to be successfully completed will be looser than it should be.

The machine of the present invention is provided with a thread retainer mounted for cooperation with the gripping jaws of the thread holder to prevent release of the thread therefrom before the first stitch of a new seam has been completed. This is accomplished by arranging the retainer in such manner that it is impossible for the thread to escape from the jaws by lateral movement, the only release possible for the thread being by lengthwise frictional engagement with the jaws. As in the Seely and Tetrault patents the jaws also have a cutter knife arranged in convenient relation thereto.

The thread gripping jaws of the illustrated machine are similar to those of prior machines and consist of a pair of elongated plates **18** and **20** having flaring spaced ends arranged to form a thread receiving throat **19**. The plates are pressed yieldingly toward each other by reason of their resiliency and are secured to a supporting strap **22** by means of clamp screws **24** passing through the plates into threaded engagement with the strap. The screws also pass through slots in a thread cutter knife **26** which acts as a backing for the heads

of the screws. The strap in turn is secured to a portion of a frame 28 for the machine by screws 30 passing through slots in the strap.

The thread retainer for the gripping jaws comprises a leaf spring 32 through perforations in which the screws 24 pass to hold it in position on the strap 22 in proper relation to the jaws. The spring 32 is reduced in width near its left end, being exposed beyond the cutter knife 26 beneath which its right end is clamped to the strap 22. At its left extremity the spring has secured to it a latch block 34 (Fig. 3) passing through a pair of registering slots 36 in the plates 18 and 20. The latch block is formed from a section of rod-shaped material slabbed off at an angle at its thread engaging end. The arrangement is such that the thread, indicated at 38, extending between a sewn shoe and the looper may be moved laterally into the throat of the holder at the end of a seam. As it enters the throat of the holder it wedges the plates 18 and 20 apart and forces the latch block yieldingly outwardly through its slots 36 until the thread passes over the slabbed off end and beyond the extreme point of the latch block. The thread is held thereafter from lateral disengagement from between the plates by the side of the block with the only possible escape being in a lengthwise direction. The thread is then severed by engagement with the knife 26 in the usual manner leaving the end of thread projecting slightly from between the jaw plates.

During the formation of the first stitch in a new seam the thread is retained securely by the plates 18 and 20 until after the looper lays the thread in the hook of the needle 4, as illustrated in Fig. 2. As the needle retracts with the thread, it is moved lengthwise from between the jaw plates of the holder until its end approaches the needle perforation in the work. The needle reenters the work during the next sewing cycle and withdraws a new thread loop through that formed during the first sewing cycle. As the succeeding stitch is tightened some slippage of the thread in the work may occur in the previous needle perforations but not sufficient to cause the thread end in the first stitch to be retracted completely. Accordingly, the stitches all will be inserted with effective tension and proper formation is insured beginning with the first complete sewing cycle in the machine.

In order to limit entry of the thread to a uniform position between the gripper plates 18 and 20 so that an excessive resistance to lengthwise movement of the thread will be avoided, the plate 18 has secured to it one end of a pin 40, the other end of which extends at right angles to the plates and through an alined opening in the plate 20. As the thread is carried laterally into the throat of the gripping jaws it will be engaged first by the latch block 34 and then by the limit pin 40 which serves as a gage to prevent entry of the thread between the jaws beyond a predetermined position. Thus, the amount of tension required to retract the thread end from the holder will always be the same during repeated operations. This tension is regulated to insure laying the thread with certainty in the hook of the needle during operation of the looper and to prevent disengagement of the thread end entirely from the grip of the jaws during the first sewing cycle of a new seam. After the first stitch of a seam is completed and the next sewing cycle is started, the frictional engagement of the thread in the first stitch is sufficient to insure complete withdrawal of the thread from the jaws.

The nature and scope of the invention having been indicated and an embodiment having been described, what is claimed is:

1. A machine for sewing an inseam to connect a ribbed insole and an upper of a shoe, having stitch forming devices and a thread holder provided with opposed gripping jaws pressed yieldingly toward each other and disposed with flaring spaced ends forming a throat to admit lateral entry of the sewing thread extending between a sewn shoe and the stitch forming devices, in combination with a thread retainer disposed between the jaws to prevent lateral release of the thread from the throat of the jaws as a sewing operation on a new shoe is started.

2. A machine for sewing an inseam to connect a ribbed insole and an upper of a shoe, having stitch forming devices and a thread holder provided with opposed gripping jaws pressed yieldingly toward each other and disposed with flaring spaced ends forming a throat to admit lateral entry of the sewing thread extending between a sewn shoe and the stitch forming devices, in combination with a latch block adjacent to the gripping jaws and engageable by the thread during its lateral movement between the jaws to prevent lateral release of the thread from the throat of the jaws as the sewing operation of a new shoe is started.

3. A machine for sewing an inseam to connect a ribbed insole and an upper of a shoe, having a frame, stitch forming devices and a thread holder provided with opposed gripping jaws pressed yieldingly toward each other and disposed with flaring spaced ends forming a throat to admit lateral entry of the sewing thread extending between a sewn shoe and the stitch forming devices and a strap on the frame to which the jaws are secured, in combination with a latch block adjacent to the gripping jaws engageable by the thread during its lateral movement between the jaws to prevent lateral release of the thread from the throat of the jaws as the sewing operation of a new shoe is started, and a spring clamped to the strap, to which spring the latch block is secured to enable the block to be forced yieldingly from the path of the thread as it enters the throat of the jaws.

4. A machine for sewing an inseam to connect a ribbed insole and an upper of a shoe, having a frame, stitch forming devices, a thread holder provided with opposed gripping jaws pressed yieldingly toward each other and disposed with flaring spaced ends forming a throat to admit lateral entry of the sewing thread extending between a sewn shoe and the stitch forming devices and a strap on the frame to which the jaws are secured, in combination with a latch block, adjacent to the gripping jaws engageable by the thread during its lateral movement between the jaws to prevent lateral release of the thread from the throat of the jaws as the sewing operation of a new shoe is started, a spring clamped to the strap, to which spring the latch block is secured to enable the block to be forced yieldingly from the path of the thread as it enters the throat of the jaws, and a pin extending at right angles to the jaws for engagement with the thread to limit the lateral movement of the thread between the jaws beyond a predetermined position.

5. A machine for sewing an inseam to connect a ribbed insole and an upper of a shoe, having a frame, stitch forming devices, a thread holder provided with opposed gripping jaws pressed yieldingly toward each other and disposed with flaring spaced ends forming a throat to admit lateral entry of the sewing thread extending between a sewn shoe and the stitch forming devices and a strap on the frame to which the jaws are secured, in combination with a latch block passing through the gripping jaws engageable by the thread during its lateral movement between the jaws to prevent lateral release of the thread from the throat of the jaws and a pin secured at one end to one of the jaws with the other end passing through the other jaw for engagement with the thread to limit the lateral movement of the thread between the jaws beyond a predetermined limit.

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