Aug. 17, 1943. R. W. WATTS 2,327,146

SHOE SEWING MACHINE

Filed Sept. 11, 1942

Fig. 1

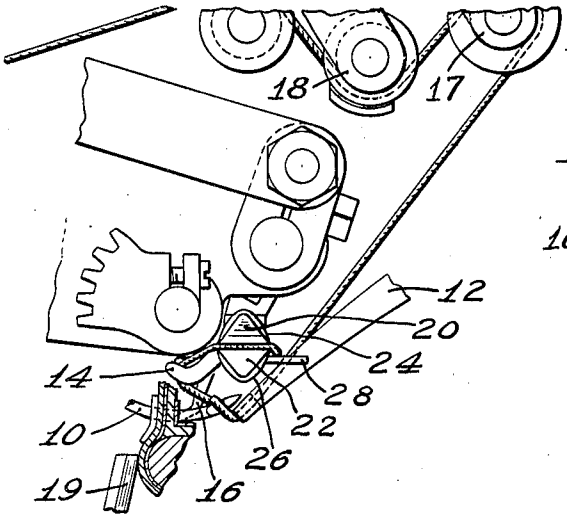


Fig 2

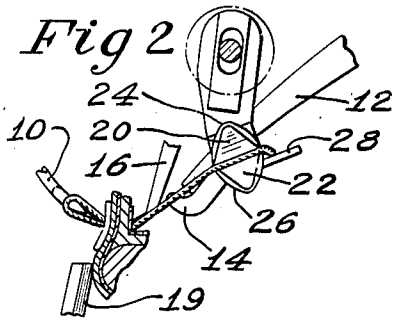


Fig. 3

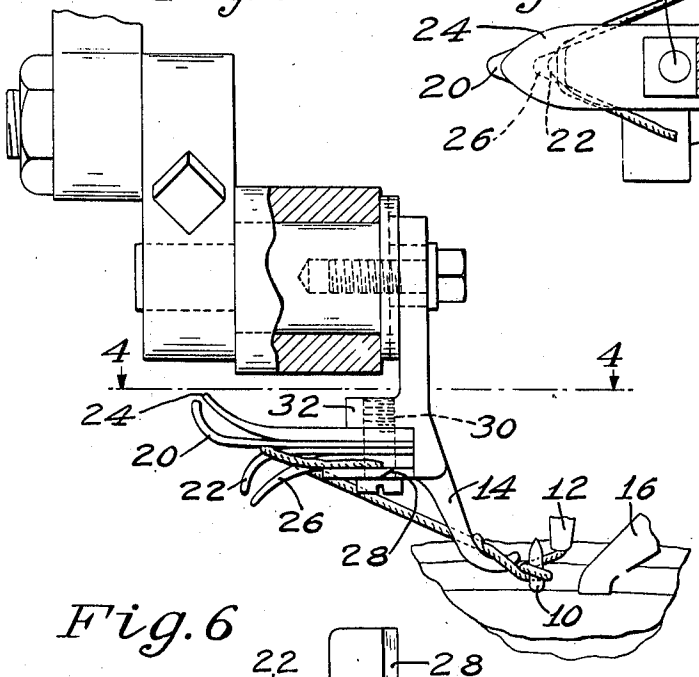


Fig. 4

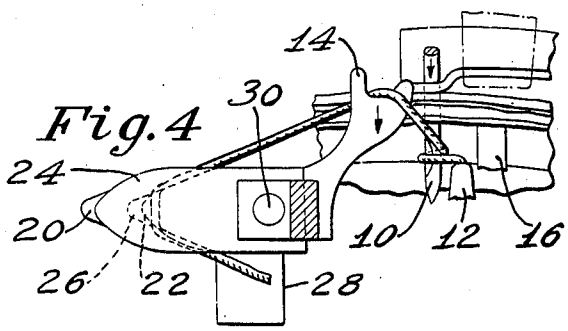


Fig. 5

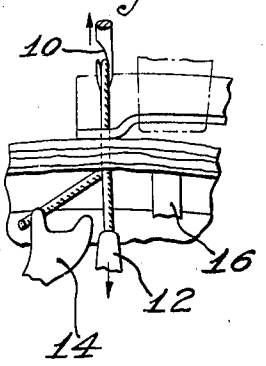
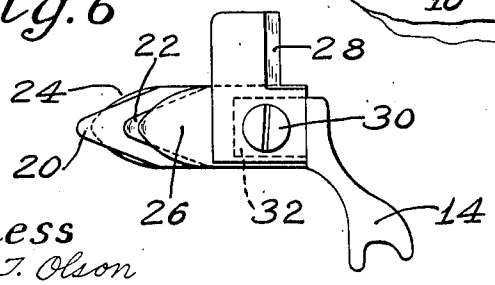


Fig. 6



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UNITED STATES PATENT OFFICE

2,327,146

SHOE SEWING MACHINE

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Application September 11, 1942, Serial No. 457,999

4 Claims. (Cl. 112—252)

The present invention relates to improvements in shoe sewing machines, and more particularly to an improved construction and arrangement of the thread handling device in a wax thread chain stitch sewing machine for sewing the inseam, with reference particularly to a thread cutting and holding device provided for use to sever the thread at the completion of a seam, and to hold the end of the thread during the formation of the first stitches of a new seam.

The invention is hereinafter disclosed as embodied in an inseam sewing machine of the general type illustrated in the patent to Eppler, No. 1,108,560, of which the thread handling devices include a curved hooked needle, a take-up operative to pull in the previous stitch against the shank of the needle, and to draw off thread from the supply, a needle threading looper, and a thread finger which cooperates with the looper to supply slack thread to the work side of the needle loop during the loop drawing stroke of the needle. Machines of this description may be provided also with a thread cutting and holding device such as that illustrated for example in the patent to Seeley, No. 1,324,985, to sever and to hold the severed end of the thread.

In machines of the general type described, the thread clamping and severing device is mounted in an exposed, readily accessible position on the sewing head for the convenience of the operator, who is expected in removing the shoe from the machine to catch on the clamp and to sever the thread from the shoe. Such devices of the prior art are normally mounted on the upper part of the sewing head, either on a fixed part of the machine or on the looper, and are so far removed from the sewing point that a considerable length of thread is left standing above the work at the beginning of each successive seam. Where clamps of this type have been employed a close adjustment of the restraining friction is required which will be sufficient to prevent the pulling out of the thread by the thread pulling action of the take-up and needle in the formation of the first stitch without at the same time interfering with the gradual withdrawal of the thread from the clamp as the shoe is fed to the left during the formation of the succeeding stitches of the seam. In machines of the general type described having a curved hook needle and cooperating instrumentalities for sewing a chain stitch, it has been considered necessary to locate the thread clamping and severing device with relation to the sewing point so that a relatively long thread end is provided at the beginning of the seam to avoid a possible pulling out of the initial stitch or stitches in the event that the thread is prematurely dislodged from the clamp.

It is a principal object of the invention to provide in a machine of the class described, a novel and improved construction and arrangement of a thread holding and severing device which will permit a simpler motion to be imparted to the shoe when released from the machine to engage the thread in the clamp, and further is constructed and arranged with respect to the thread handling devices to cause an extremely short end to be left standing above the work at the start of a seam with a consequent substantial saving in the amount of thread required for the sewing operation upon each successive shoe.

It is a further object of the invention to provide a novel and improved arrangement of the thread handling devices of the machine including specifically the thread holding and severing device whereby the thread holding device is caused to move relatively to the stitch forming instrumentalities in such a manner as to reduce to a minimum the possibility that the thread may be inadvertently pulled out of the clamp during the formation of the initial stitch or stitches of the seam.

In accordance with the above noted and other objects as may hereinafter appear, applicant provides a thread severing and holding device which is mounted on the thread finger and in a position closely adjacent the sewing point so that a short end only will be left standing above the work at the start of a seam. In the illustrated embodiment of the invention, the thread severing and holding unit is located somewhat above and forward of the sewing point and to the left, that is, on the side of the sewing point with the completed stitches of the seam.

The several features of the invention consist also in the devices, combinations and arrangement of parts hereinafter described and claimed, which together with the advantages to be obtained thereby, will be readily understood by one skilled in the art from the following description taken in connection with the accompanying drawing, in which Fig. 1 is a fragmentary detail view in left side elevation illustrating particularly the needle, looper, thread finger and thread cutting and holding unit, the parts being shown with the needle through the work at the completion of the needle threading movement of the looper, and with the thread finger in its fully

extended rearward position engaging a bight of thread; Fig. 2 is a view similar to Fig. 1, but showing the needle during its retracting movement and with the thread finger moved in a forward direction so that the bight of thread held thereby has been given up to the needle; Fig. 3 is an enlarged view in front elevation illustrating substantially the parts in Fig. 1, and in the same position; Fig. 4 is a sectional plan view taken on the line 4—4 of Fig. 3; Fig. 5 is a detail plan view illustrating substantially the parts shown in Fig. 2, and in the same position; and Fig. 6 is an enlarged detail plan view looking from beneath, illustrating particularly the thread finger and thread cutting and holding unit secured thereto.

The inseam shoe sewing machine illustrated in the drawing, is fully disclosed in the patent to Eppler, No. 1,076,878, to which reference may be had for a detailed description of the construction, arrangement and mode of operation of its various parts. In the drawing, the curved hook needle of the machine is indicated at 10, the looper at 12, the thread finger at 14, the channel guide at 16, the take-up at 17, the auxiliary take-up at 18, and the usual back gauge at 19. The thread handling devices referred to are arranged to operate in the manner of the corresponding devices of the Eppler patent referred to and in accordance with a system of operation well-known in the art. The curved hook needle 10, starting from its fully retracted loop-drawing position strikes into the work from the welt side and emerges from the channel formed at the base of the sewing rib of the insole. During this advancing movement of the needle the take-up 17 completes its take-up movement to tighten the previously formed stitch about the shank of the needle and to draw off new thread from the supply. The thread finger 14 now advances to form a bight in that portion of the thread extending from the work. As the needle approaches the limit of its work-piercing movement, the looper 12 moves to wrap thread about the needle. For this position of the parts, which is substantially that shown in Fig. 4, the thread finger 14 is moving toward the front of the machine following the movement of the needle. The needle now starts its retracting movement to draw the new loop of thread through the work, while the thread finger continues its thread-giving movement, moving forwardly across the sewing rib to supply slack thread to the work side of the needle loop.

In accordance with the present invention a thread cutter and clamp is provided which is supported to move as a unit with the thread finger, and is located in an entirely new position with respect to the thread handling devices to the left of and in close proximity to the sewing point. The thread holding and severing device of the preferred construction illustrated comprises a pair of spring plates 20, 22, supporting plates 24, 26, and a knife 28 assembled in a unit on a stud 30 screw threaded into a lug 32 formed on the thread finger 14. From an inspection of the drawing, it will be evident that the thread holding and severing device is located somewhat above and forwardly of the sewing point and with the jaw opening of the thread clamp extending leftwardly in the direction of feed of the shoe. In order to grip and sever the thread upon the completion of a sewing operation, the operator moves the shoe away from the sewing instrumentalities leftwardly in the direction of feed, then forwardly and to the right to catch the thread in the clamp and to bring the portion of the thread adjacent the shoe over the edge of the knife 28 to sever the thread. The location of the thread holding and severing device is such as to permit the thread gripping and severing operation to be carried out by the operator with certainty and dispatch. The position of the device relative to the looper for the stop position of the parts is such that movement of the shoe leftwardly in the general direction of feed of the shoe, and upwardly as necessary to clear the shoe from the stitch forming and work guiding mechanism, will cause the thread to find the jaws of the clamp without any necessity of visual inspection.

The operation of the thread handling devices and the thread cutting and holding device associated therewith to support the thread end particularly during the formation of the initial stitches of the seam, will be briefly described as follows: Assuming that the machine is in stop position with the needle retracted and the thread end extending from the looper 12, firmly held in the thread clamp, the starting of machine operation now causes the needle to advance through the work and the take-up to complete its take-up movement, as above set forth. The clamp is of sufficient strength to prevent the thread from being pulled from between the spring plates 20—22 by the action of the take-up acting against a thread tension which may be of ordinary description and is not here specifically shown.

Substantially as the take-up completes its take-up movement and while the needle is penetrating the work, the thread finger 14 and the thread clamp supported thereon move rearwardly across the sewing rib to engage and form a bight in the thread extending from the looper to the clamp. The looper now acts to wrap a loop of thread around the shank of the still advancing needle 10, and the thread finger and thread clamp start moving forwardly with the needle, as indicated by the arrows in Fig. 4. Inasmuch as the thread finger 14 and the thread clamp are supported to move as a unit there is no tendency at this time for the thread to reave through the throat of the thread finger which might cause the thread end to be dislodged from the clamp. The thread finger continues its thread-giving movement forwardly across the sewing rib to supply slack thread to the work-side of the needle loop as the needle is retracted through the work. It will be evident that during this thread-giving movement of the thread finger and until substantially the position of Fig. 5 is reached, there will be no tendency of the retracting needle to draw the thread end from the clamp. During the last portion of the needle loop-drawing stroke, however, a small amount of thread may be drawn from the clamp, somewhat shortening the thread end held therein. As succeeding stitches are formed and the shoe is advanced toward the left, the distance between the point of entry of the thread end into the work and the clamp is substantially shortened, so that the chance is still further reduced that the thread will be prematurely pulled out of the clamp. As the shoe continues its feeding movement to the left and the point of attachment of the thread to the shoe passes beyond the open jaws of the clamp, the thread end is drawn out of the clamp with a minimum of resistance and without any tendency to interfere with the feed of the shoe or with its manipulation by the operator.

The construction and arrangement of thread handling devices above described in which the thread clamping and severing device is supported to move as a unit with the thread finger, has been found particularly well adapted to insure the formation of tight, even stitches at the beginning of the seam while at the same time permitting of substantial savings in the amount of thread consumed during the performance of the sewing operation on successive shoes. The greater efficiency and certainty of operation of applicant's improved device in which the motion of the thread finger is imparted to the thread clamping and severing device has made it unnecessary to provide the wasteful longer thread end as a margin of safety against the possible premature slipping of the thread end out of the clamp. The location of the clamping and severing unit on the thread finger has the further advantage that it permits of a more favorable location of the unit for the performance of the clamping and cutting operation by the operator since the motion which it is required to impart to the shoe to catch the thread in the clamp is substantially that required to remove the shoe from the machine with only slight modification. The location of the clamp close to the sewing point so far increases the probability that the thread will be engaged between the jaws of the clamp that unobstructed vision is no longer necessary to enable the operator to perform this operation in a satisfactory manner.

It will be understood that the invention is not limited to the specific embodiment shown and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

What is claimed is:

1. An inseam chainstitch shoe sewing machine having, in combination, stitch forming devices including a hooked needle arranged to strike into the work from the outside and to emerge from the insole, a looper, a thread finger movable to supply slack thread to that side of the needle loop extending from the work, and a thread clamping and cutting unit supported on the thread finger to move as a unit therewith comprising cooperating surfaces to frictionally hold the thread passed therebetween by the operator, and a knife blade for severing the clamped portion of the thread from the work.

2. An inseam chainstitch shoe sewing machine having, in combination, stitch forming devices including a hooked needle arranged to strike into the work from the outside and to emerge from the insole, a looper, a thread finger movable to supply slack thread to that side of the needle loop extending from the work, and a thread clamping and cutting unit comprising a pair of spring jaws mounted on the thread finger with the opening thereof extending generally in the direction of the completed stitches of the seam to frictionally hold the thread passed between said jaws by the operator, and a knife blade for severing the clamped portion of the thread from the work.

3. An inseam chainstitch shoe sewing machine having, in combination, stitch forming devices including a curved hooked needle arranged to strike into the work from the outside and to emerge from the insole, a looper, a thread finger movable to supply slack thread to that side of the needle loop extending from the work, and a thread clamping and cutting unit mounted on the thread finger comprising cooperating surfaces to frictionally hold the thread passed therebetween by the operator, and a knife blade for severing the clamped portion of the thread from the work, said unit being located in close proximity to the sewing point and with the thread receiving surfaces extending from the thread finger generally in the direction of the completed stitches of the seam.

4. An inseam chainstitch shoe sewing machine having, in combination, stitch forming devices including a curved hook needle arranged to strike into the work from the outside and to emerge from the insole, a looper, thread finger movable to supply slack thread to that side of the needle loop extending from the work, and a thread clamping and cutting unit mounted on the thread finger in close proximity to the sewing point and comprising a pair of spring jaws with the opening thereof extending from the thread finger generally in the direction of the completed stitches of the seam, a pair of supporting plates for said jaws, and a knife blade for severing the clamped portion of the thread from the work.

RAYMOND W. WATTS.