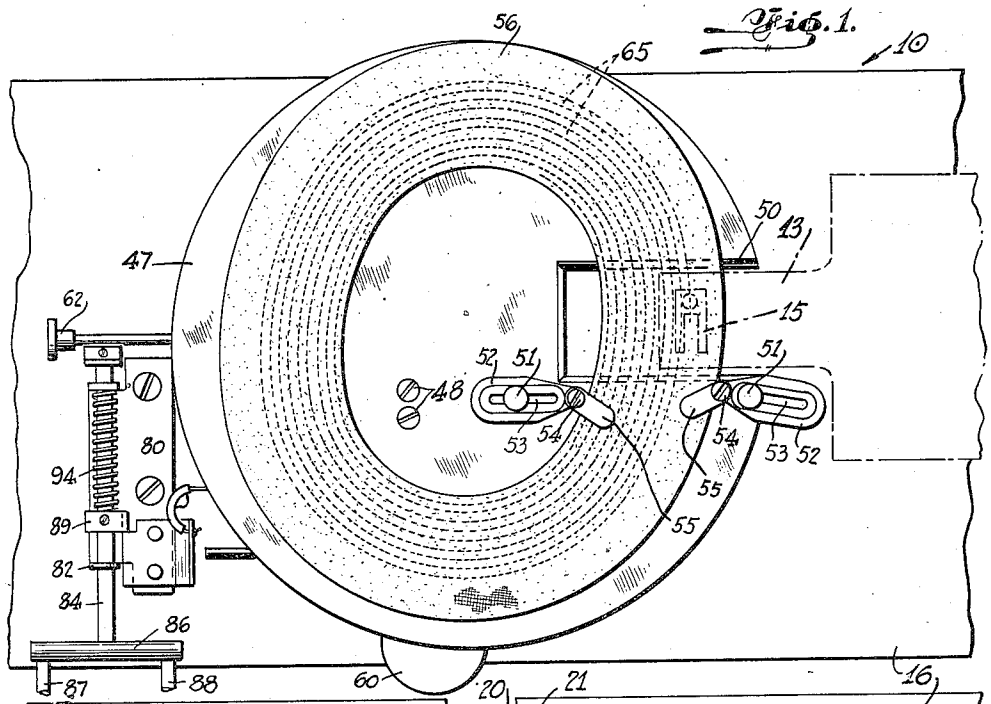
March 9, 1948. I. SUTKER 2,437,624

WORK-HOLDING AND GUIDING MECHANISM FOR SEWING MACHINES

Filed Aug. 21, 1945 3 Sheets-Sheet 1

Fig. 1.



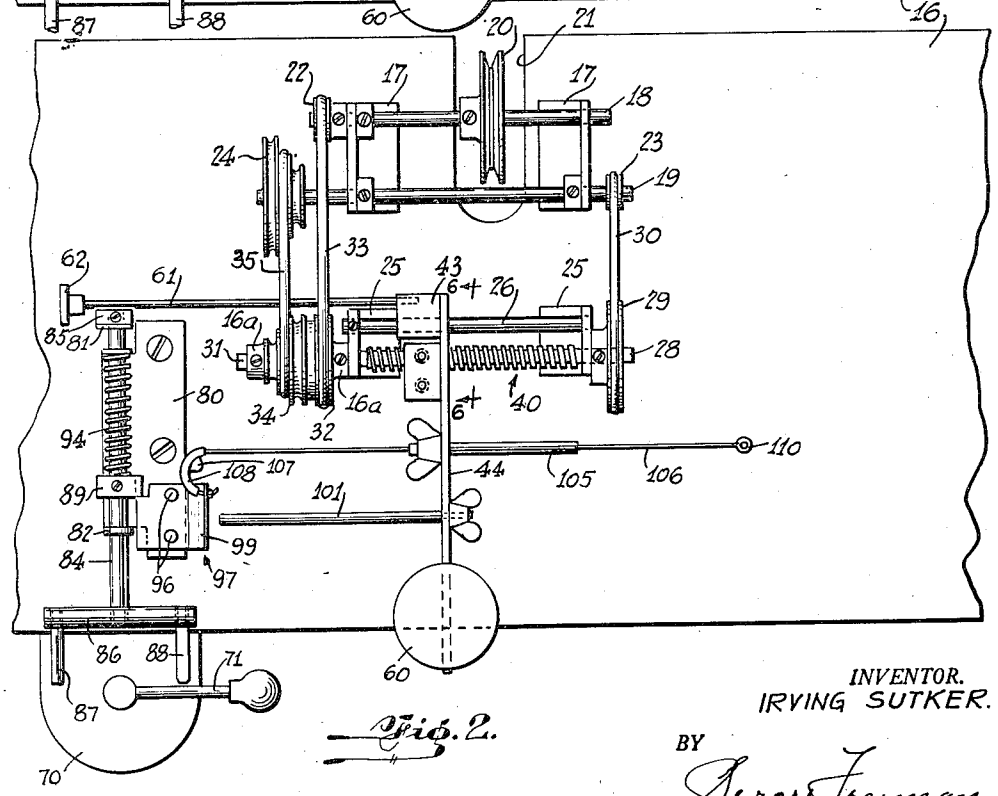


Fig. 2.

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March 9, 1948. I. SUTKER 2,437,624

WORK-HOLDING AND GUIDING MECHANISM FOR SEWING MACHINES

Filed Aug. 21, 1945 3 Sheets-Sheet 2

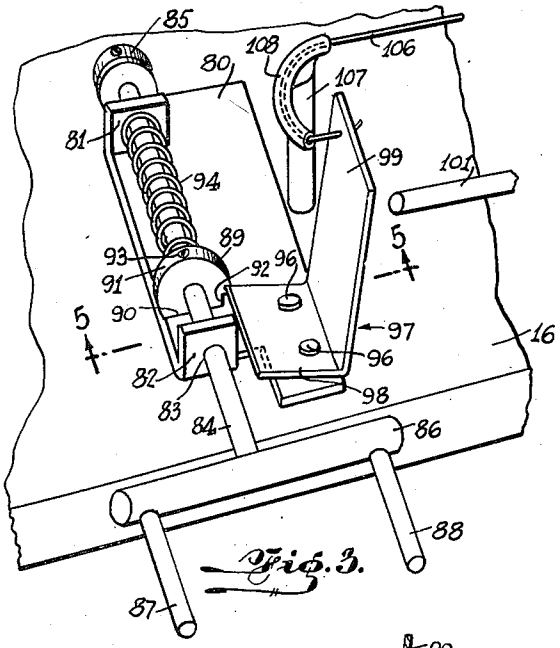


Fig. 3.

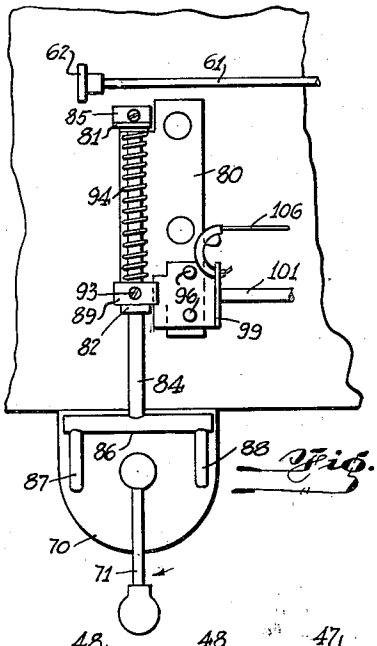


Fig. 4.

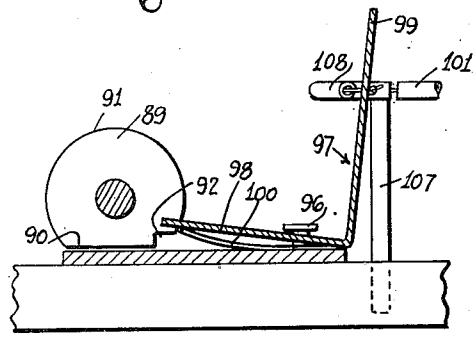


Fig. 5.

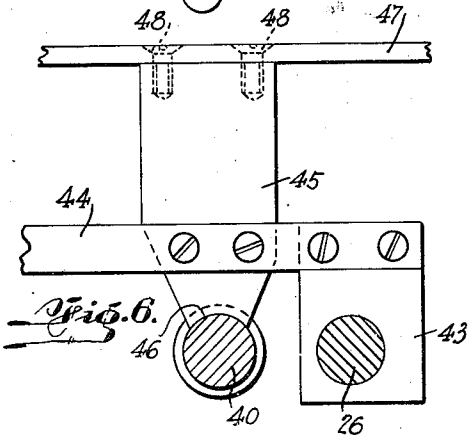


Fig. 6.

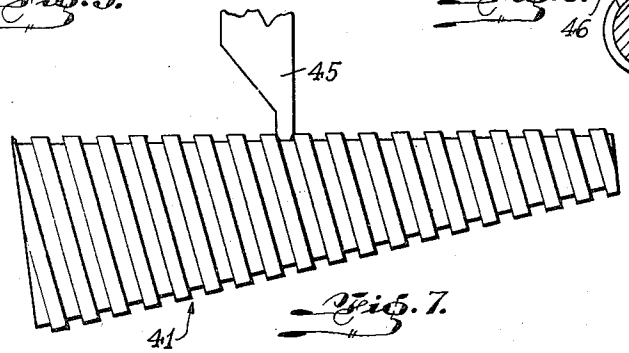


Fig. 7.

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WORK-HOLDING AND GUIDING MECHANISM FOR SEWING MACHINES

Filed Aug. 21, 1945 3 Sheets-Sheet 3

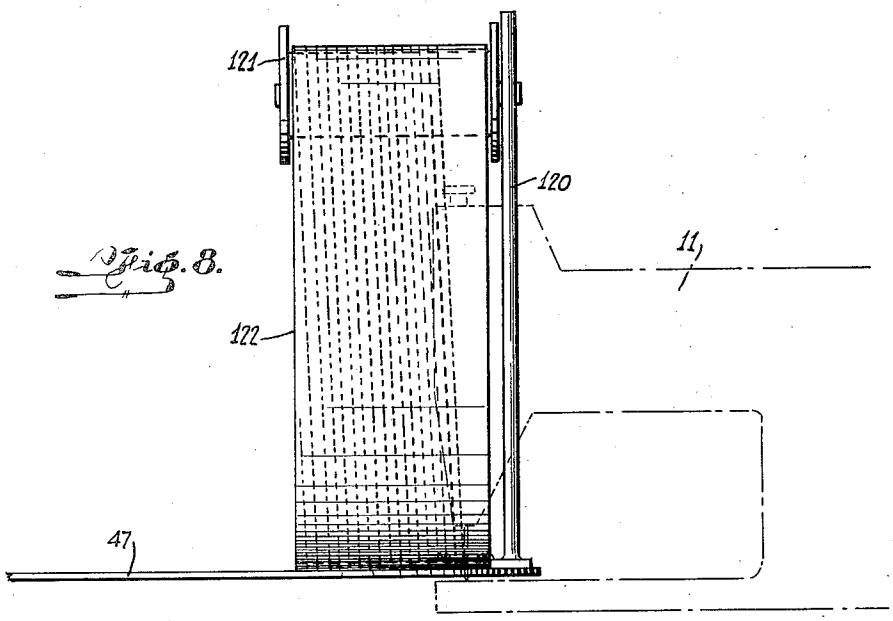


Fig. 8.

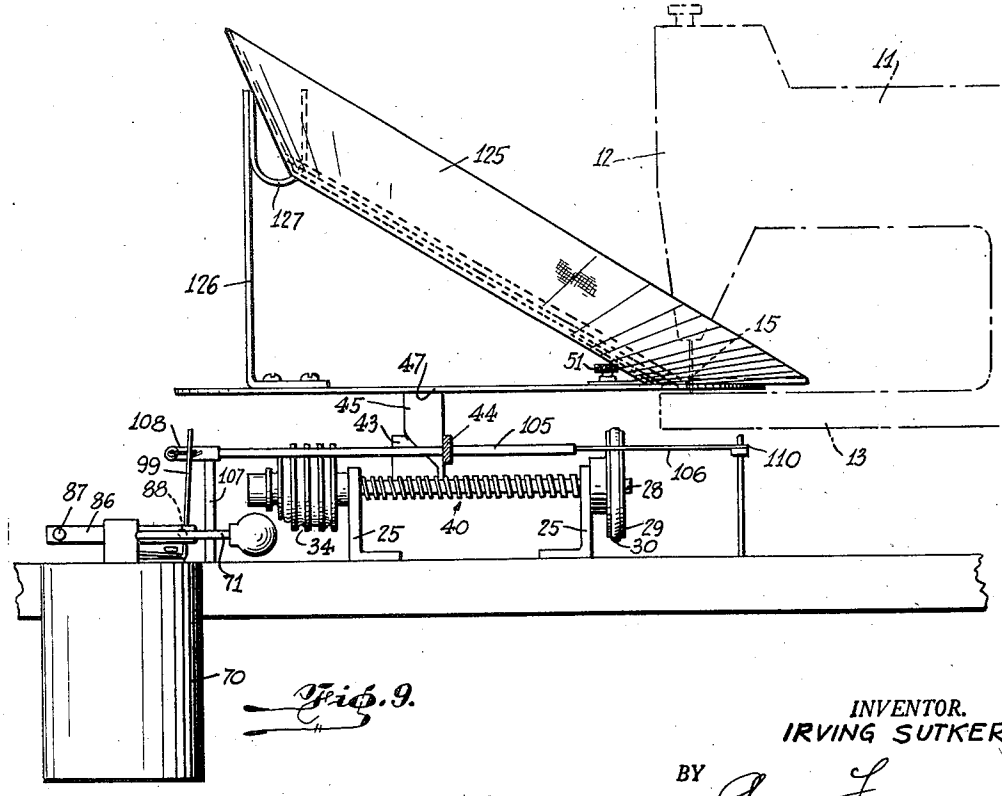


Fig. 9.

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Patented Mar. 9, 1948 2,437,624

UNITED STATES PATENT OFFICE

2,437,624

WORK-HOLDING AND GUIDING MECHANISM FOR SEWING MACHINES

Irving Sutker, Brooklyn, N. Y.

Application August 21, 1945, Serial No. 611,734

1 Claim. (Cl. 112—2)

1

This invention relates to a work holder and guide for sewing machines. It is particularly directed to a device for applying continuous spiral or helical stitching to a hat brim, sleeve, or the like piece of fabric.

An object of this invention is to provide in a device of the character described, means for keeping the successive turns of stitching equally spaced apart.

Another object of this invention is to provide in a device of the character described, a holder on which is mounted a work piece to be stitched spirally, means to move the holder together with the work piece, transversely of the direction of stitching, and means to vary the speed of movement of the holder, whereby to retain the successive turns of stitching substantially equally spaced apart.

Another object of this invention is to provide a device of the character described so arranged that the hat brim or like article may be stitched either from the outside inwardly, or from the inside outwardly, so that one brim may be stitched from the outside inwardly, and removed from the machine, and then another brim may be placed on the holder and stitched from the inside outwardly, means being provided to automatically stop the transverse movement of the holder each time the holder reaches a predetermined position, moving in either direction, to permit replacement of the stitched brims.

Another object of this invention is to provide in a device of the character described, a work holder, means to move the work holder in one direction and then in the opposite direction transversely as the work thereon is advanced by the sewing machine, a reversible switch to control the power drive for moving the holder, and means to throw the switch to neutral from either direction, at the end of each sewing operation.

Yet a further object of this invention is to provide a strong, durable and compact device of the character described, which shall be smooth and positive in operation, relatively inexpensive to manufacture, easy to assemble and manipulate, and yet practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claim.

2

In the accompanying drawings, in which is shown various possible illustrative embodiments of this invention:

Fig. 1 is a top plan view of a device embodying the invention.

Fig. 2 is a view similar to Fig. 1, but showing the work holder removed from its support.

Fig. 3 is a partial perspective view of the switch and its control.

Fig. 4 is a top plan view of the switch and its control.

Fig. 5 is a cross-sectional view taken on line 5—5 of Fig. 3.

Fig. 6 is a cross-sectional view taken on line 6—6 of Fig. 2.

Fig. 7 is a side elevational view of the transverse screw and illustrating a modified construction.

Fig. 8 is an elevational view illustrating the use of the invention on a tubular work piece.

Fig. 9 is an elevational view of the invention with a modification of the work-supporting means.

Referring now in detail to the drawing, 10 designates a device embodying the invention and adapted to be used in conjunction with a sewing machine 11, of usual construction.

The machine 11 comprises a head 12, a base 13, and is provided with a presserfoot 15.

The device 10 comprises a horizontal base 16 disposed below the base 13 of the sewing machine. Mounted on said base 16 are a pair of parallel brackets 17 supporting a pair of transverse parallel rotary shafts 18 and 19. On shaft 18 is a drive pulley 20. The base 16 may be provided with a notch or cut-away 21 so that a belt around the pulley 20 may pass downwardly to a power drive.

At one end of shaft 18 is a pulley 22. On one end of shaft 19 is a pulley 23 for the purpose hereinafter appearing. On the other end of shaft 19 is a cone pulley 24. On the base 16 is another pair of parallel brackets 25. Supported on the brackets 25 is a fixed guide rod 26 parallel to shafts 18 and 19. Rotatably supported on said brackets 25 is a shaft 28 parallel to guide rod 26. At one end of shaft 28 is a pulley 29 aligned with pulley 23. Interconnecting the pulleys 23, 29 is a belt 30. Supported on base 16 is a bearing 16a carrying a shaft 31. Fixed on shaft 31 is a pulley 32 aligned with pulley 22, and interconnecting the pulleys 22, 32 is a belt 33. Fixed on shaft 31, adjacent pulley 32, is a cone pulley 34 tapering oppositely to the pulley 24 and cooperating therewith. Interconnecting the pul-

leys 24 and 34 is a belt 35. It will now be understood that the drive for shaft 28 is through pulley 20, shaft 18, pulley 22, belt 33, pulley 32, pulley 34, belt 35, pulley 24, shaft 19, belt 30, and pulley 29.

Shaft 28 is formed between the brackets 25 with a feed screw 40, which has a thread which increases in pitch from the right end to the left end, looking at Fig. 2. The screw may have a plurality of pitches at different parts thereof, for example three pitches. For instance, the thread at the right is of less pitch; at the middle the thread is of increased pitch; and at the left, the thread has still greater pitch.

Slidably mounted on the guide rod 26 is a block 43. Attached to the guide block 43 and extending forwardly therefrom is an arm 44. Attached to arm 44 is a plate 45 formed at its lower end with a thread engaging edge or portion 46 engaging the threads of screw 40.

Screwed to the upper end of plate 45 is a plate or work holder 47. Work holder 47 may be attached to the plate 45 by means of screws 48. The holder 47 may be circular and is formed with a radial notch 50, registering with the base 13 of the sewing machine. On the upper side of the holder 47 and adjacent one edge of the notch 50 are a pair of headed screws 51. Slidably mounted on plate 47 are bars 52, each formed with a slot 53 to receive the stem of one of the screws 51. At the inner ends of the bars 52 are screws 54, on each of which is pivotally mounted an angularly adjustable arm 55. The hat brim 56 or other work to be stitched, is placed on the work holder 47. The bars 52 may be adjusted and the arms 55 swung into overlying position to engage the work to retain it on the work holder. The presserfoot 15 of the sewing machine overlies the hat brim 56.

It will now be understood that as the sewing machine operates, the work holder will be moved from either right to left, or from left to right, depending on the direction of rotation of the drive. Such movement is due to the fact that plate 45 engages the feed screw 40 and therefore moves member 44 and block 43 to the right or left, depending on direction of rotation of the screw.

Attached to the outer end of arm 44 is a weight 60 which may be lifted to disengage plate 45 from the screw 40. Fixed to block 43 is a push-pull rod 61 provided with a handle 62 at its free end. When the weight 60 and hence the arm 44 is lifted, handle 62 may be pushed or pulled to adjust the holder to any desired position along feed screw 40. Arm 44 may then be lowered to again engage plate 45 with the screw 40.

It will now be understood that spiral stitching 65 may be applied to the hat brim or other work 56. During the stitching operation, the hat brim is moved round and round, and due to movement of the work holder transversely, the stitching is spiral. Due to the fact that the pitch of screw 40 decreases from left to right, the successive turns or windings of the stitching will be equally spaced apart. The variance of the pitch of the screw, is so arranged as to provide for substantially equally spaced apart windings or turns of stitching.

The drive for pulley 20 is by means of a reversible motor. For this reason, the stitching 65 may be applied from the inside of the brim toward the outside, or from the outside to the inside. To save operating time, a brim is placed on the holder 47 and stitched, for instance, from the inside to the outside. The machine is stopped, the brim removed, and another brim placed on the holder, and the latter is then stitched from the outside to the inside. Then the stitched brim is removed, another brim placed on the holder, and stitched from the inside to the outside.

The motor for the drive is controlled by a micro-switch 70 provided with a switch arm 71. Switch arm 71 is in neutral position when it is directed as shown in Fig. 4. When the arm 71 is swung 90° to the right, the drive is in one direction, and when said switch arm is moved 90° to the left of neutral, the drive is in an opposite direction.

Means is provided to automatically swing the switch arm 71 to neutral position after each stitching operation, regardless of direction of drive. To this end there is mounted on base 16, a bracket 80 fixed thereto in any suitable manner. Bracket 80 is provided with a pair of upstanding ears 81, 82 formed with aligned openings 83. Slidably mounted in said openings is a rod 84. Fixed to the rear end of rod 84 is a collar 85, and fixed to the front end of said rod is a transverse rod 86. Fixed to the ends of rod 86 are forwardly projecting arms 87 and 88. On rod 84 and disposed between ears 81, 82 is a collar 89. Collar 89 has a flat under edge 90 to prevent its rotation and a part circular peripheral edge 91. It is formed on one end of the flat undersurface 90 with a notch 92 for the purpose hereinafter appearing.

Collar 89 is fixed to the rod 84 by set screw 93. Interposed between collar 89 and ear 81 is a coil compression spring 94 to urge rod 84 forwardly. On bracket 80 are a pair of headed rivets or pins 96. Loosely mounted on the stems of said pins 96 is an angle plate 97. Plate 97 has a horizontal portion 98 and a vertical portion 99. The plate 97 has a small, rocking movement due to the fact that the stems of the rivets 96 pass through openings in wall 98 which are oversized relative to the stems, but smaller than the heads of the rivets. Below wall 98 is a leaf spring 100 which tends to swing the rocker angle plate 97 in a clockwise direction looking at Fig. 5. In the position shown in Fig. 5, one edge of wall 98 contacts collar 89 just above notch 92 to retain arms 87—88 out of contact with the switch arm 71.

Fixed to arm 44 is a push rod 101, one end of which is in alignment with wall 99 of rocker plate 97. When the work holder moves to the left, push rod 101 is adapted to engage wall 99 of rocker plate 97 to swing the rocker plate in a counterclockwise direction for moving wall 98 into notch 92, thereby permitting spring 94 to move rod 84 forwardly so that one of the arms 87, 88 will engage switch arm 71 and move the same to neutral position to stop the operation of the sewing machine and transverse drive. The stitched hat brim 56 may then be removed and a new one put on the holder. The switch arm is then moved manually to reverse position and the next brim is then stitched in an opposite direction. Attached to arm 44 is a tube 105 through which extends a cord, wire or other flexible member 106. Fixed to base 16 is an upstanding post 107 and at the upper end of this post is a curved guide tube 108. One end of the tube is adjacent the upper end of wall 99 of rocker plate 97. The cord 106 passes through tube 108 and is attached to the upper end of wall 99. At the outer end of the cord 106 is a head or knot 110. As the work holder moves to

the right, tube 105 will engage the head or knot 110 at the end of the stitching operation, thereby pulling cord 106 and causing rocker plate 97 to again be swung in a counterclockwise direction for again releasing rod 84, thereby again moving the switch handle 71 to neutral position. It will be noted that before the switch handle 71 is swung to the right or left, bar 84 is pushed back until collar 89 clears wall 98, thereby permitting spring 100 to swing the rocker plate to a position where it will engage the collar 89.

In Fig. 7 there is shown a screw 41 illustrating a modified form of feed screw. The feed screw 41 is conical in shape, being smaller at the right end and of greater diameter at the left end. The axis for cone screw 41 is at an inclination and the top of the cone is in horizontal position as shown in the drawing. With such construction likewise the transverse movement will be such that the spacing of the turns of stitching will be substantially equal. The linear speed of stitching is constant and with cone screw 41, the speed of transverse movement increases from right to left.

In Fig. 8 the work holder 47 is provided with an upstanding support 120. At the upper end of the support 120 is a roller 121. With such construction a cylindrical work piece or sleeve 122 may be stitched helically. With such construction the transverse screw has one pitch throughout.

In Fig. 9, means is provided to stitch a frustoconical hat brim 125. To this end the work holder 47 is provided, adjacent its outer end with an upstanding support 126. At the upper end of support 126 is a U-shaped hook 127 adapted to engage the work piece. Thus one end of the work piece is down on the work table at the point of stitching, whereas the other end is held up so that the work piece is at an inclination to the work table.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above

set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

A device of the character described comprising a base, a screw mounted thereon for rotation, means to rotate the screw, a guide shaft parallel to said screw, a member slidably mounted on the guide shaft, means on said member to disengageably engage the threads of the screw, a work holder on said member, a handle on said member to facilitate the swinging of said member about the axis of said shaft for disengaging the screw engaging means relative to the screw, the means for rotating the screw being controlled by a reversing switch, a rod slidably mounted on said base, said rod having a pair of arms, one arm being adapted to move the switch from one operating position to neutral, and the other arm being adapted to move the switch from reverse operating position to neutral position, spring means to urge said rod to a position for moving the switch to neutral position, means to retain said rod in retracted position, and means to release said retaining means as said member reaches a predetermined position in one direction, and said means also serving to release said retaining means as said member reaches a predetermined position in an opposite direction.

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