May 14, 1968 R. W. WINBERG 3,382,829

NEEDLE POSITIONER FOR A SEWING MACHINE

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FIG. 1.

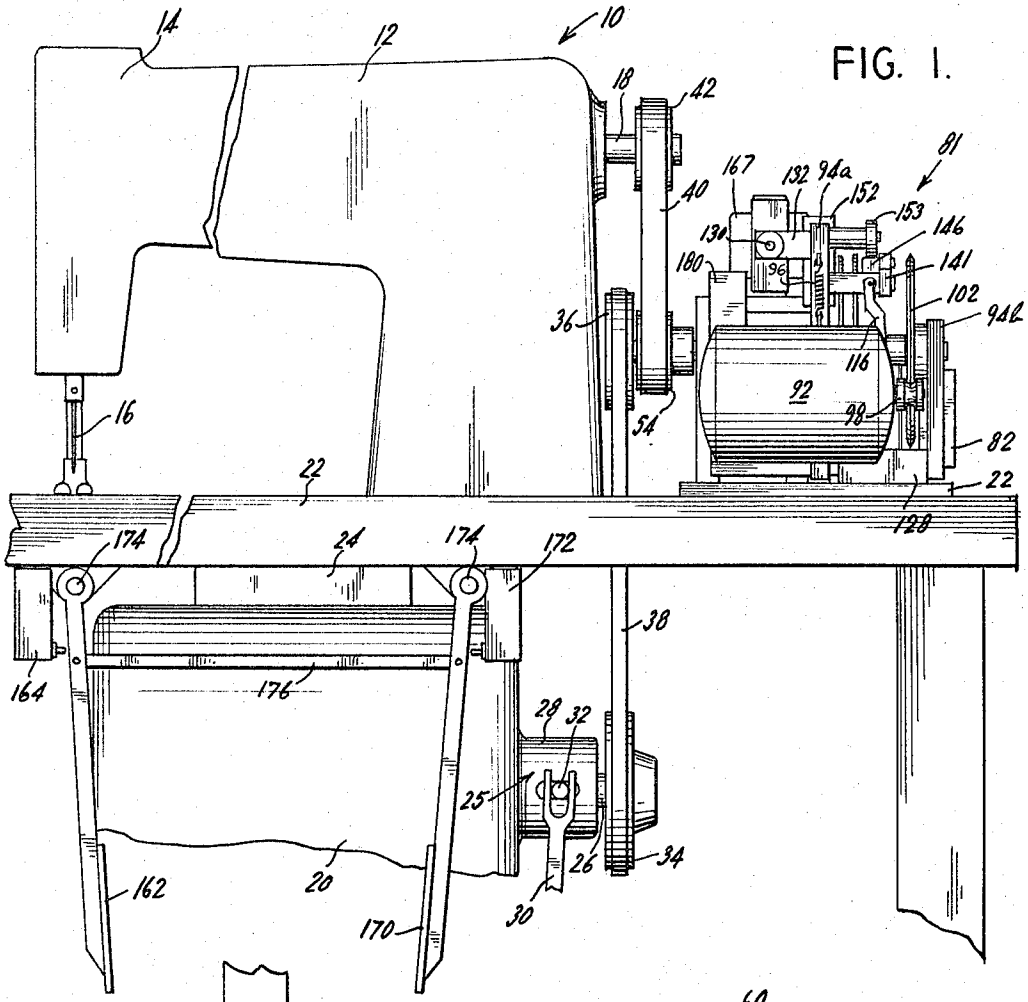
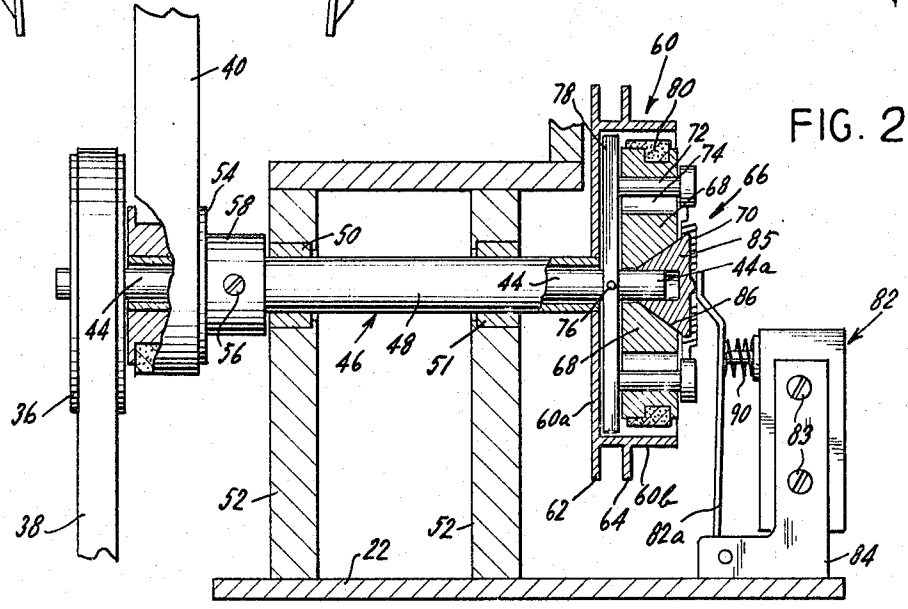


FIG. 2.



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NEEDLE POSITIONER FOR A SEWING MACHINE

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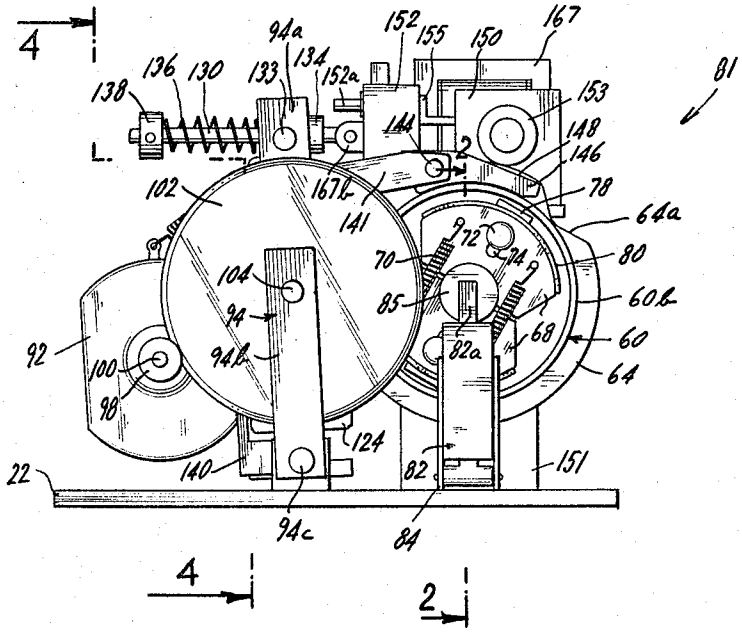
FIG. 3.



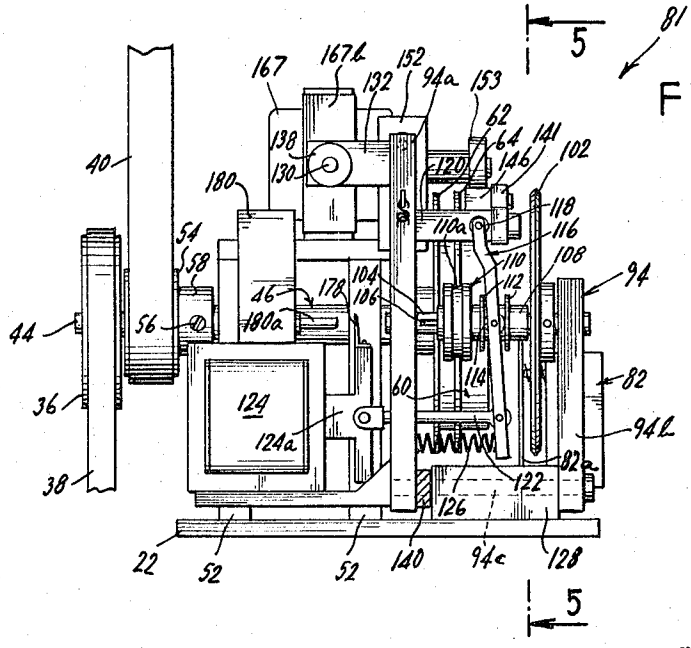


FIG. 4.

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NEEDLE POSITIONER FOR A SEWING MACHINE

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FIG. 5.

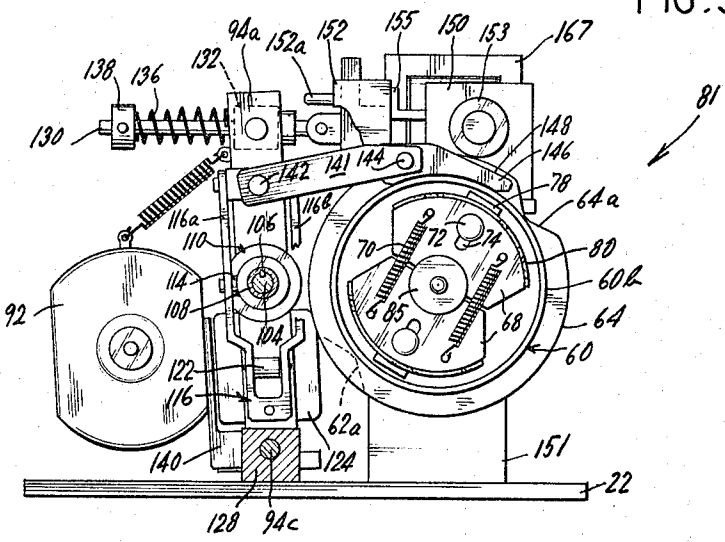
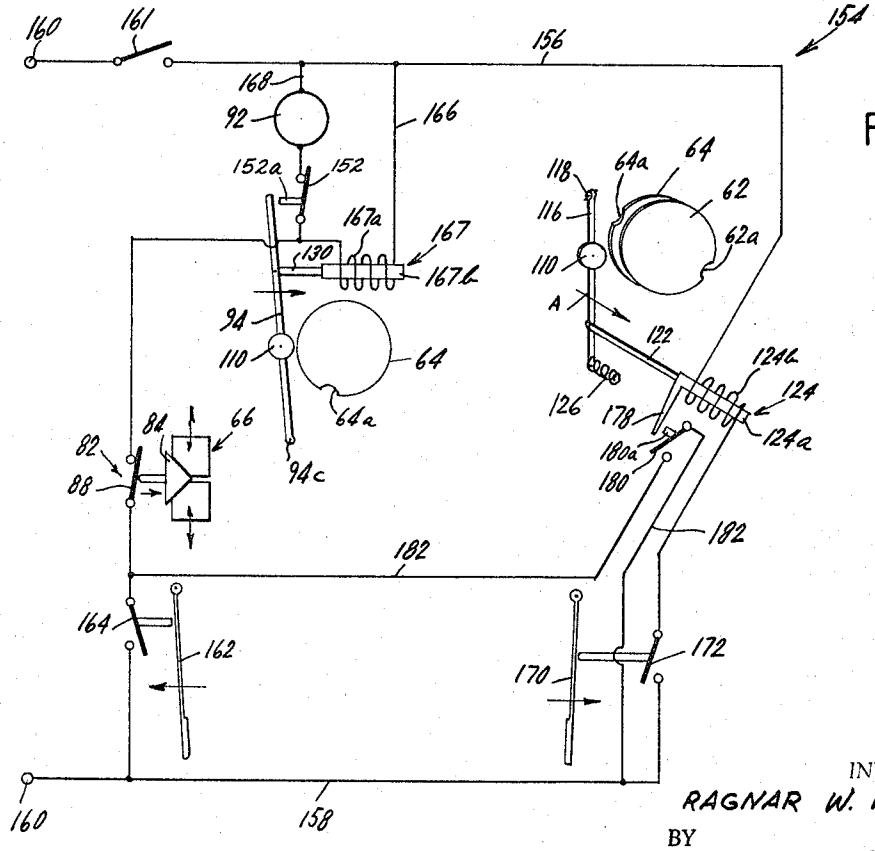


FIG. 6.



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NEEDLE POSITIONER FOR A SEWING MACHINE

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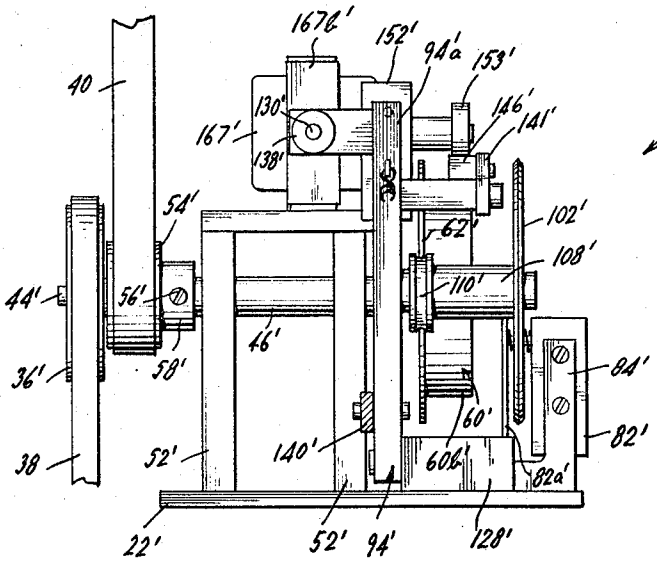
FIG. 7.



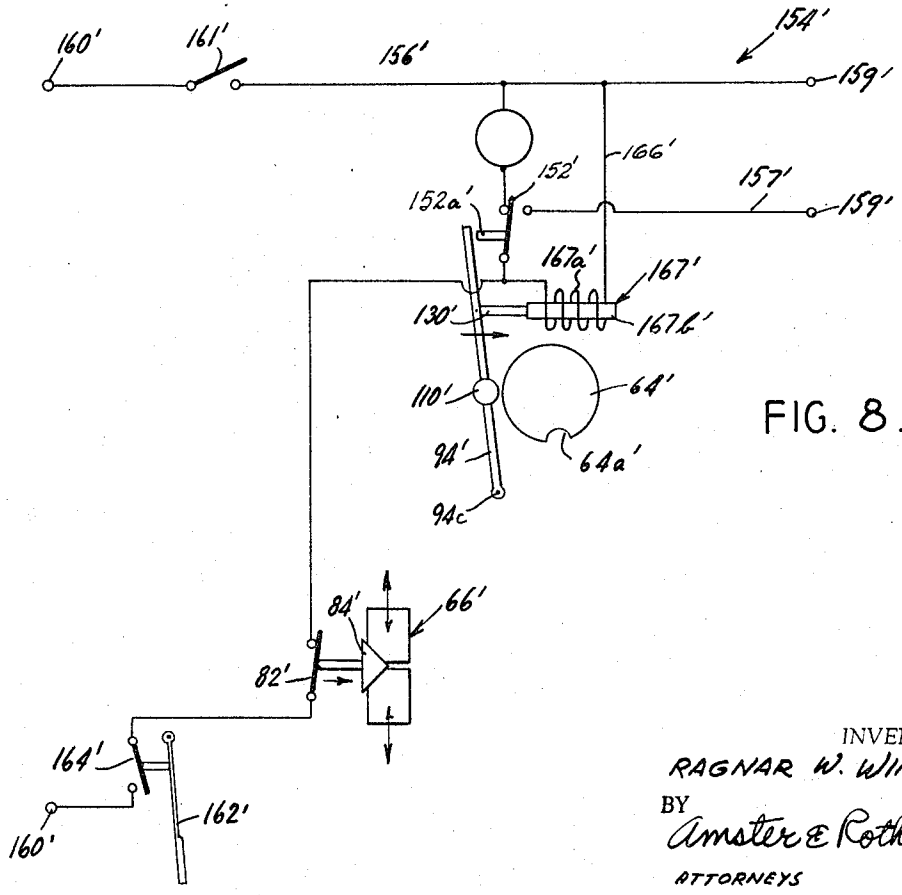


FIG. 8.

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United States Patent Office 3,382,829
Patented May 14, 1968

3,382,829

NEEDLE POSITIONER FOR A SEWING MACHINE

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Filed Dec. 2, 1964, Ser. No. 415,267
6 Claims. (Cl. 112—219)

The present invention relates generally to accessory mechanisms for a sewing machine, and in particular to a needle positioner for use in conjunction with a sewing machine for achieving a desirable known oriented position of the needle relative to the work being sewn during intervals between stitching periods.

In a wide variety of sewing machines, it is advantageous to make positive provision for the orientation of the movable needle of the stitching mechanisms relative to the work at the end of a stitching period or interval. For example, in the operation of a sewing machine it is important to position the movable needle in a retracted or clearance position relative to the work to facilitate the unloading and reloading of the machine, and preparatory to changing the direction of sewing it is desired to have the needle penetrated through the work for rotation of the work about the axis of the needle. There are various commercially available needle-positioning units which may be built into such sewing machines or attached thereto for orienting the needle in relation to the work. However, such units are comparatively complicated in construction and therefore relatively expensive, both with respect to the initial cost and expenses attendant to installation and servicing. There exists a need for a relatively simple, rugged and comparatively low cost unit which may be readily combined with a conventional sewing machine and which is easily adjusted to establish one or more oriented positions for the needle of the stitching mechanisms relative to the work at the end of successive stitching periods or intervals.

Broadly, it is an object of the present invention to provide a needle positioner which realizes one or more of the aforesaid objectives. Specifically, it is within the contemplation of the present invention to provide an electromechanical needle-positioning unit which may be readily combined with a conventional sewing machine, and which is capable of establishing the required oriented positions of the needle relative to the work under control of the machine operator.

Another object of the present invention is to provide a needle positioner which is operable only during intervals between stitching periods thereby obviating any possibility of malfunction due to inadvertent operation of the needle positioner during the main sewing operation.

In accordance with an illustrative embodiment demonstrating objects and features of the present invention, there is provided a sewing machine which includes stitching mechanisms having a needle which enters and is withdrawn from the work during successive stitching cycles. The machine has a main drive coupled to the stitching mechanisms and includes a driven member as an integral part of its mechanisms for driving the stitching mechanisms. A needle positioner is operatively connected to the stitching mechanisms and the driven member of the main drive is also an integral part of the needle positioner mechanisms for driving the stitching mechanisms. Located at the input to this common driven member of the main drive and of the needle positioner is switching means which permits the operation of the driven member only for the main drive or for the needle positioner, but not both. Thus, malfunction due to simultaneous operation of of the main drive producing sewing and of the needle positioner is obviated.

The needle positioner also includes two auxiliary driven means in the form of tracks on its driven member which corresponds to the number of required oriented positions of the needle relative to the work being sewn. Additionally, the needle positioner is provided with an auxiliary driving member which is movable into a position adjacent to one of said auxiliary driven means and into and out of driving relation to said auxiliary driven means to cooperate therewith to provide an oriented position of said needle relative to said work. One of the auxiliary driven means or tracks is appropriately indexed to provide a raised needle position preparatory to removal of the work from the sewing machine, and the other auxiliary driven means appropriately indexed to provide a down or work-penetrating needle position permitting rotation of the work about the axis of the needle preparatory to changing the direction of sewing.

The above brief description, as well as further objects, features and advantages of the present invention, will be more fully appreciated by reference to the following detailed description of presently preferred, but nonetheless illustrative embodiments in accordance with the present invention, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is an elevational view of a needle positioner demonstrating features of the present invention in combination with a sewing machine, portions of the illustrated parts thereof being broken away;

FIG. 2 is an elevational view, on an enlarged scale, and in section taken on lines 2—2 of FIG. 3, illustrating a portion of the main drive of the sewing machine and a main circuit switch for the electrical control of the needle positioner;

FIG. 3 is an end elevational view projected from FIG. 1, on the same enlarged scale, and illustrating details of construction of the needle positioner;

FIG. 4 is an elevational view similar to FIG. 2, in section taken on lines 4—4 of FIG. 3, illustrating further details of construction of the needle positioner;

FIG. 5 is an end elevational view similar to FIG. 3, in section taken on lines 5—5 of FIG. 4, and illustrating details of construction of the driving and driven members of said needle positioner;

FIG. 6 is a circuit diagram of the electrical control incorporated in the needle positioner hereof, including a diagrammatic showing of the parts thereof directly effecting said control;

FIG. 7 is an elevational view similar to FIGS. 2 and 4, but of another embodiment of a needle positioner; and

FIG. 8 is a circuit diagram similar to FIG. 6, but of the electrical control for the needle positioner of FIG. 7.

Having reference first to FIG. 1, there is shown therein a conventional sewing machine **10** having a casing **12** housing a sewing head **14** on one end thereof which includes mechanisms for reciprocating a sewing needle **16**. As is generally understood, needle reciprocation is produced by a main shaft **18** journalled for rotation in the casing **12** and driven in rotation by a main motor **20**; the machine **10** and motor **20** being advantageously respectively mounted above and below a table **22** and the drive therebetween achieved through a suitable opening in the table **22**.

More particularly, the motor **20** is suspended from a suitable bracket **24** from the underside of the table **22** and, at one end, through a clutch or similar power transfer device **25**, powers a drive shaft **26** journalled for rotation in an end housing **28**. Power transfer is advantageously controlled in response to movements of the usual sewing machine foot treadle (not shown), the movements of which are in turn transmitted through a lever **30** engaging an external extension of a power transfer shaft **32** to selectively operate the shaft **26** in rota-

tion. Mounted on the end of the shaft **26** is a pulley **34** aligned with a shaft-mounted pulley **36** located above the table **22** adjacent the sewing machine **10**. A conventional endless pulley belt **38** is extended through an opening in the table **22** and is trained about the pulleys **34**, **36** to provide rotation of these pulleys in unison. In a manner now to be described, this rotation is transmitted through a second pulley belt **40** to a pulley **42** mounted on an end of the main shaft **18** of the machine **10** to operate this shaft and achieve vertical reciprocation of the sewing needle **16**.

Referring to FIG. 2, it will be seen that the shaft mounting pulley **36**, designated **44**, is horizontally disposed through a driven member **46** formed as an integral part of the sewing machine main drive and is mounted on the table **22** to the right of the sewing machine **10** (see FIG. 1). More particularly, driven member **46** receives the shaft **44** through a sleeve section **48** thereof which is rotatably mounted in spaced bearings **50**, **51** in an upright support **52** of the table **22**. Adjacent pulley **36** is another pulley **54** about which the belt **40** is trained for driving pulley **42** and thus the sewing machine **10**; pulley **54** being mounted and secured on the sleeve **48** by radial locking screws **56** through a hub **58** of the pulley. Disposed on the end of the sleeve **48** and rotatable therewith is a drum **60** including a radial wall **60***a*, a rim **60***b*, and a pair of spaced rim extensions or tracks **62**, **64**. The pulley shaft **44** extends beyond the drum wall **60***a* and has mounted on its extending end a clutch **66** for making a driving connection between the shaft **44** and drum **60**, and thus completing the power transmission from the main motor **20** through the belts **38** and **40** to the sewing machine **10**.

By a comparison of FIGS. 2 and 5, it is best seen that the clutch **66** includes a pair of clutch blocks **68** which under the urgency of springs **70** are normally in the position depicted in FIG. 2 closed about the shaft end **44***a*. Upon rotation at an appropriate speed of the shaft **44**, however, the blocks **68** slidably mounted by pins **72** disposed through slots **74** therein are rotated on a rod **78** fixed at **76** to the shaft **44** and thus the blocks **68** move outwardly under the urgency of centrifugal force on the rod **78** to make a driving connection between a friction-surfaced material **80** on the periphery of each block **68** and the underside of the drum rim **60***b*. This is effective to cause rotation in unison of the pulleys **36**, **54** during usual operation of the sewing machine **10**. However, when sewing is discontinued, as for example by movement of the usual foot treadle control and its lever **30** disengaging the pulley **34** from its driving connection to the motor **20**, the resulting FIG. 2 position of the clutch **66** will naturally result in disruption of power transmission to the sewing machine **10** and stoppage of the needle **16**, either in a position through the work being sewn or a position removed therefrom, whichever by chance is the position of the needle **16** at the time that sewing is discontinued.

To achieve a known position of the needle **16** relative to the work, which may require further operation of the sewing machine **10** and movement of the needle **16**, is the function of the needle positioner herein generally designated **81**. To insure that it functions only after the discontinuation of sewing, the needle positioner **81** includes in its electrical circuit a main circuit switch **82** mounted by bolts **83** in a bracket **84** on the table **22** and operated by the clutch **66** when it assumes its FIG. 2 position. More particularly, there is interposed between the clutch blocks **68** a sliding block **85** which is cammed by the inclined cam surfaces **86** of each off of the pulley shaft end **44***a* to actuate the switch arm **82***a* of the switch **82**. When the blocks **68** open during rotation of the shaft **44** at an appropriate speed, however, the side block **85**, aided somewhat by the switch spring **90**, closes on the shaft end **44***a* and the switch **82** opens to render the needle positioner **81** inoperative during this period of usual operation of the sewing machine **10**.

Returning again to the assumed condition of discontinuance of sewing and the required operation at this time of the needle positioner **81**, as best seen in FIGS. 1, 3 and 5 there is mounted on the table **22** in front of the main sewing machine drive arrangement of FIG. 2 an auxiliary motor **92** and means for independently driving the driven member **60** in rotation in order to move the needle **16** into a known oriented position relative to the work being sewn. A U-shaped bracket **94** mounts the motor **92** and, under the urgency of springs **96** a friction drive is established between a disc **98** on the motor shaft **100** and a disc **102** fixed on a shaft **104** rotatably mounted between the two vertical legs **94***a*, **94***b* of the bracket **94**. As best shown in FIG. 4, keyed as at **106** for rotation with the shaft **104** is a slidable member **108** having a driving member **110** adapted to selectively engage in a peripheral groove **110***a*, one or the other of the two tracks **62**, **64** of the needle positioner driven member **60**. Formed on the member **108** adjacent the driving member **110** are spaced radial extensions **112** straddling a roller **114** on a lever **116** pivotally connected, as at **118**, at one end to a horizontal extension **120** on the large vertical leg **94***a*. At its opposite end, the lever **116** is connected to a plunger rod **122** of a solenoid switch **124** and also to a biasing spring **126** which is effective to normally maintain the FIG. 4 position of the lever **116** and thus the position of the driving member **110** adjacent the track **64**. However, upon operation of the solenoid switch **124** the plunger **124***a* thereof is withdrawn within the body of the switch and through the rod **122** the driving member **110** is moved axially along the shaft **104** opposite the other track **62**, all as is subsequently set forth in greater detail herein.

Referring specifically to FIG. 5, it will be better seen that the horizontal leg **94***c* of the bracket **94** is pivotally mounted in a block **128** on the table **22** and that the driving member **110** is normally clear of the driven member **60**. This is to permit unimpeded alignment of the member **110** adjacent one or the other of the two tracks **62**, **64** on the member **60**. Following this, the drive between the members **110**, **60** is established by pivotal movement of the bracket **94** about the axis of the leg **94***c* thereof. To this end, the leg **94***a* of the bracket **94** has another solenoid switch plunger rod **130** disposed through another horizontal extension **132** (see FIG. 4) pivotally mounted at one end as at **133** to it and retained against a stop **134** by a spring **136** seated at its other end against a stop **138**. The bracket leg **94***c* also mounts an L-shaped bracket **140** which actually holds the auxiliary motor **92**.

Still referring to FIG. 5, it will be seen that the lever **116** is actually a U-shaped configuration and that the solenoid plunger rod **122** is pinned between the lower portions of its two arms **116***a*, **116***b*, and that the extension **120** is similarly pinned between the upper portions of these arms. Additionally, a link **141** is pivoted, at **142**, to the extension **120** and at its other end, at **144**, to a brake shoe **146**. On full pivotal movement of the bracket **94** the brake shoe **146** is cammed by a cam surface **148** of a frame block **150** of the positioner **81** against the drum rim or wall **60***b* to stop rotation of the driven member **60**. At the same time that the brake shoe **146** is applied, the switch arm **152***a* of still another switch **152** is adapted to be actuated by contact with the uppermost end of the large vertical bracket leg **94***b* to deenergize or open the electrical circuit of the auxiliary motor **92**. As best illustrated in FIGS. 3 and 5, standing upright on the table **22** behind the drum **60** is a support post **151** for supporting the frame block **150** and also the switch **152**; the block **150** being pivotally mounted on a cylindrical bar **153** on the post **151** and the switch **152** being supported on an L-shaped bracket **155** connected to the block **150**.

It will be particularly noted that to establish driving contact between the driving member **110** and the periphery of either one of the tracks **62**, **64** of the driven member drum **60** involves only a partial pivotal movement of the bracket **94**, and that a full movement or traverse of the

bracket occurs only when a cut-out **62***a*, **64***a* in these respective tracks is encountered. More particularly, the cut-out **64***a* in the track **64** is provided at a location therein to provide a raised position in the needle **16** relative to the work, and the cut-out **62***a* in the track **62** in a diametrically opposite position to provide a needle position through the work. As is generally understood, a raised position of the needle **16** is desired preparatory to removing the work from the sewing machine **10**, and a down needle position through the work is desired for rotating the work about the axis of the needle preparatory to changing the direction of sewing.

Operation of the needle positioner **81** is best explained in connection with the circuit diagram of FIG. 6 to which reference is now made. Let it be assumed that the main sewing operation is discontinued and that it is desired to remove the work being sewn from the sewing machine **10** requiring a raised needle position. Let it further be assumed that the needle **16** is in a position of penetration through the work preventing removal of the work. As shown in FIG. 6, the electrical circuit generally designated **154** includes main power lines **156**, **158** respectively connected, as at **160**, across an appropriate power source. Line **156** advantageously includes a hand-operated switch **161** which is shown open in FIG. 6, but which will now be assumed to be closed. To move the needle **16** to its raised position the operator actuates the left knee-press **162** to in turn actuate the switch **164** associated with this knee-press and which is mounted on the underside of table **22** in the path of movement of the knee-press **162** (see FIG. 1). In the electrical circuit **154** the switch **164** is incorporated in a line **166** connected across the main power lines **156**, **158** and including the series connected switch **82** and the coil winding **167***a* of the solenoid switch **167**. Since under the assumed conditions, the main sewing operation is discontinued, it follows that the sliding block **85** is cammed into a position actuating the switch arm **88** into a position closing the switch **82** and that the coil **167***a* is energized to withdraw the plunger **167***b*. Thus, rod **130** connected to the plunger **167***b* is moved in a direction pivoting the bracket **94** toward the driven member **60** and more particularly brings the driving member **110** againt the track **64** of the driven member **60**. Connected in parallel to the line **166** is a line **168** having the auxiliary motor **92** and the normally closed switch **152** connected in series so that at this time the auxiliary motor **92** is energized and is driving the member **110** in rotation. The driving relationship established by the contact of the driving member **110** against the track **64** results in rotation of the driven member **60** until the cut-out **64***a* in the track **64** is encountered, which as previously mentioned is indexed or located along the periphery of the track **64** to provide a raised oriented position of the needle **16** relative to the work. Upon encountering the cut-out **64***a* the driving member **110** enters said cut-out, and the bracket **94** then attains its full pivotal position in which the brake shoe **146** is cammed against the drum wall **60***b* to stop rotation of the driven member **60** and also the upper end of the large vertical leg **94***a* of the bracket **94** contacts the switch arm **152***a* of the switch **152** to open the motor circuit line **168** and cease operation of the motor.

Still referring to FIG. 6, and again assuming discontinuation of the main sewing operation, let it be assumed that it is now desired to change the direction of sewing which requires a work-penetrating or down needle position, and that the needle **16** is in a raised position. In this instance, the operator actuates the right knee-press **170** which in turn actuates the switch **172** mounted in the path of movement thereof and also on the underside of the table **22**. As shown in FIG. 1, both the left and right knee-presses **162**, **170** are respectively pivotally mounted, as at **174** to the table **22** and to prevent inadvertent simultaneous actuation of the switches **164**, **172** these knee-presses are provided with a cross bar **176** which prevents simultaneous outward movement of the knee-presses **162**, **170**. Actuation of the right knee-press **170** closes the switch **172** in the line **158** completing this circuit (again assuming the switch **161** is closed) and energizing the coil **124***a* of the solenoid switch **124** incorporated in this circuit. This is effective to withdraw the solenoid plunger **124***b* within the body of the solenoid switch **124** and cause pivotal movement of the lever **116** in a direction causing axial movement of the slidable member **108** in the direction (designated A in FIG. 6) along the shaft **104** to position the driving member **110** adjacent the track **62** of the driven member **60**. As best seen in FIG. 4, during the terminal portion of travel of this axial movement an extension **178** bolted on the solenoid plunger **124***b* contacts an actuating arm **180***a* of a switch **180** mounted on the solenoid **124** and closes the switch **180**. This completes the circuit of the line **166** through a line **182** which by-passes the open left knee-press switch **164** and through the closed switch **180** is connected directly to the main power line **158**. Thereafter the operation of the needle positioner **81** as effected by its electrical control **154** proceeds in the step-by-step sequence already described in connection with achieving the raised oriented position of the needle **16**. That is, solenoid switch **167** is effective to pivot the driving member **110** in driving engagement against the driven member **60**, but this time against the track **62** thereof, and simultaneously the auxiliary motor **92** is energized to drive the driving member **110** in rotation. Rotation of the driven member **60** will occur until the cut-out **62***a* is encountered in the track **62**, which is designed to occur at a point of rotation of the driven member **60** and thus of the main shaft **18** of the sewing machine **10**, to produce a down or work-penetrating position of the needle **16**. As this point the driving member **110** will enter the cut-out **62***a* causing the application of the brake shoe **146** against drum wall **60***b* of the drum of the driven member **60** and also the opening of the switch **152** breaking the motor circuit **168** both of which is effective to stop rotation of the driven member **60**.

Reference is now made to FIGS. 7, 8 in which there is shown another embodiment of a needle positioner demonstrating features of the present invention and which is particularly intended for use with a blind stitch sewing machine. As is generally understood, in the operation of a blind stitch sewing machine the sewing needle thereof is laterally reciprocated into and out of engagement with the work being sewn, and there is only one oriented position of the needle that is required relative to the work. This oriented position is that in which the needle is withdrawn from the work preparatory to removal of the work from the sewing machine. This needle positioner embodiment and also its electrical control function in all major aspects similar to the embodiment previously described, and thus the corresponding parts of each are designated by the same but primed reference numerals. Referring first to FIG. 7, it will be seen that the needle positioner **81′** shown therein is similar in all major respects to the previously described needle positioner **81** except that consistent with providing only a single oriented position of the sewing needle, the driven member **60′** of the needle positioner **81′** has only a single track **64′**. Also the driving member **110′** is permanently located adjacent the track **64′**, and pivotal movement of the U-shaped bracket **94′** mounting the driving member **110′** is effective to establish a driving relationship between the driving and driven members **110′**, **60′**. The circuit diagram of the electrical control **154′** of the needle positioner **81′** as is clearly shown in FIG. 8 is similar in all major respects to that previously described and includes, in particular, a line **166′** including the coil winding **167***a′* of the solenoid switch **167′**, the switch **82′** under the control of the sliding block **84′** of the clutch **66′**, and the single knee-press **162′** and its associated normally opened switch **164′**. Assuming that the main sewing operation is not in progress and that the switch **82′** is therefore closed, actuation of the knee-press **162** and the closing of its associated switch **164′** completes the electrical circuit through the circuit line **166′** and is effective to cause withdrawal of the

solenoid plunger **167***b'* to establish the driving relationship between the driving member **110'** and the driven member **60'**. In the manner previously described, rotation of the driven member **60'** provides the oriented position of the needle **16** in a position removed from the work being sewn.

Advantageously incorporated in the modified circuit **154'** of this embodiment is a parallel tap-off line **157'** which is energized when the motor switch **152'** is opened at the end of the operation of the needle positioner **81'** and at a time when the removal of the needle from the work is completed. Although not shown, a thread cutter or other similar mechanism which should be operative at this time may advantageously be connected across the the tap-off line **157'** and the main circuit line **156'** at the terminals **159'** thereof.

From the foregoing, it will be appreciated that each of the embodiments of the needle positioner hereof is of an exceptionally basic construction and does not involve the utilization of commutators, brush pick-ups separate low voltage circuits and the like, with the attendant difficulties usually encountered with such more sophisticated circuitry as exemplified by the prior art devices. Rather, the present invention employs electrical and mechanical components which are relatively simple and rugged thereby enabling the construction of a needle positioning unit of comparatively low unit cost and suitable for mass production manufacture and use over long periods of time, with minimum expense for servicing, replacement of worn parts and the like. Moreover, a noteworthy constructional feature of the needle positioner is the incorporation of a driven member both in the main drive of the sewing machine and also in the drive of the needle positioner which in conjunction with switching means eliminates the possibility of any malfunction due to inadvertent actuation of the needle positioner during sewing operation of the sewing machine.

A latitude of modification, change and substitution is intended in the foregoing disclosure and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What is claimed is:

1. In a sewing machine, stitching mechanisms having a needle which enters and is withdrawn from work during successive stitching cycles, a main drive operatively connected to normally power said stitching mechanisms including a driving means and a driven member selectively coupled in driving relation to each other only during operation of said driving means above a predetermined low rotational speed, a manually operated control, and a needle positioner operatively connected to alternatively drive said driven member to power said stitching mechanisms during said low speed of rotation of said driving means of said main drive for moving said needle into a predetermined number of oriented needle positions relative to said work, said needle positioner including plural auxiliary driven means on said driven member of said main drive in a number corresponding to said predetermined number of oriented needle positions, an auxiliary drive including an auxiliary driving member movable into a position adjacent to one of said auxiliary driven means and into and out of driving relation to said auxiliary driven means, said auxiliary driving member and said auxiliary driven means cooperating in one position relative to each other to establish an oriented needle position for said needle, and means responsive to said predetermined low speed of rotation of said driving means of said main drive and to actuation of said manually operated control for moving said auxiliary driving member into a position adjacent one of said auxiliary driven means and into driving relation therewith.

2. In a sewing machine, stitching mechanisms having a needle which enters and is withdrawn from work during successive stitching cycles, a main drive operatively connected to normally power said stitching mechanisms including a driving means and a drive member selectively coupled in driving relation to each other only during operation of said driving means above a predetermined low rotational speed, a movable control, a needle positioner operatively connected to alternatively drive said driven member to power said stitching mechanisms during said low speed of rotation of said driving means of said main drive for moving said needle into a predetermined number of oriented needle positions relative to said work, said needle positioner including plural auxiliary driven means on said driven member of said main drive in a number corresponding to said predetermined number of oriented needle positions, an auxiliary drive including an auxiliary driving member movable into a position adjacent to one of said auxiliary driven means and into and out of driving relation to said auxiliary driven means, said auxiliary driving member and said auxiliary driven means cooperating in one position relative to each other to establish an oriented needle position for said needle, and means responsive to said predetermined low speed of rotation of said driving means of said main drive and to movement of said movable control for moving said auxiliary driving member into a position adjacent one of said auxiliary driven means and into driving relation therewith.

3. In a sewing machine, stitching mechanisms having a needle which enters and is withdrawn from work during successive stitching cycles, a main drive operatively connected to normally power said stitching mechanisms including a driving means and a driven member selectively coupled in driving relation to each other only during operation of said driving means above a predetermined low rotational speed, a movable control, a needle positioner operatively connected to alternatively drive said driven member to power said stitching mechanisms during said low speed of rotation of said driving means of said main drive for moving said needle into a predetermined number of oriented needle positions relative to said work, said needle positioner including an auxiliary motor, an electrical circuit for said auxiliary motor including normally open switching means therein which in response to said predetermined low speed of rotation of said driving means of said main drive closes to partially complete said electrical circuit preparatory to energizing said auxiliary motor, plural auxiliary driven means on said driven member of said main drive in a number corresponding to said predetermined number of oriented needle positions, an auxiliary driving member operatively connected to be driven by said auxiliary motor and movable into a position adjacent to one of said auxiliary driven means and into and out of driving relation to said auxiliary driven means, said auxiliary driving member and said auxiliary driven means cooperating in one position relative to each other to establish an oriented needle position for said needle, and means responsive to movement of said movable control completing said electrical circuit of said auxiliary motor and causing movement of said auxiliary driving member into a position adjacent one of said auxiliary driven means and into driving relation therewith.

4. In a sewing machine, stitching mechanisms having a needle which enters and is withdrawn from work during successive stitching cycles, a main drive operatively connected to normally power said stitching mechanisms including a driving means and a driven member selectively coupled in driving relation to each other only during operation of said driving means above a predetermined low rotational speed, a manually operated control, and a needle positioner operatively connected to alternatively drive said driven member to power said stitching mechanisms during said low speed of rotation of said driving means of said main drive for moving said needle into a predetermined number of oriented needle positions rela-

tive to said work, said needle positioner including plural auxiliary driven means on said driven member of said main drive in a number corresponding to said predetermined number of oriented needle positions, an auxiliary drive including an auxiliary driving member movable into a position adjacent to one of said auxiliary driven means and into and out of driving relation to said auxiliary driven means, said auxiliary driving member and said auxiliary driven means cooperating in one position relative to each other to estabilsh an oriented needle position for said needle, means responsive to said predetermined low speed of rotation of said driving means of said main drive and to actuation of said manually operated control for moving said auxiliary driving member into a position adjacent one of said auxiliary driven means and into driving relation therewith, a brake, means mounting said brake for movement into and out of braking position relative to said driven member of said main drive, and means responsive to movement of said auxiliary driving member and said auxiliary driven means into said one position relative to each other to move said brake into said braking position.

5. In a sewing machine, stitching mechanisms having a needle which enters and is withdrawn from work during successive stitching cycles, a main drive operatively connected to normally power said stitching mechanisms including a driving means and a driven member selectively coupled in driving relation to each other only during operation of said driving means above a predetermined low rotational speed, a movable control, a needle positioner operatively connected to alternatively drive said member to power said stitching mechanisms during said low speed of rotation of said driving means of said main drive for moving said needle to an oriented needle position relative to said work, said needle positioner including an auxiliary motor operable in response to said predetermined low speed of rotation of said driving means of said main drive and to movement of said movable control, an auxiliary driven means on said driven member of said main drive, an auxiliary driving member operatively connected to be driven by said auxiliary motor and movable into and out of driving relation to said auxiliary driven means, said auxiliary driving member and said auxiliary driven means cooperating in one position relative to each other to establish an oriented needle position for said needle, means responsive to movement of said movable control for moving said auxiliary driving member into driving relation to said auxiliary driven means, a brake, means mounting said brake for movement into and out of braking position relative to said driven member of said main drive, and means responsive to movement of said auxiliary driving member and said auxiliary driven means into said one position relative to each other to move said brake into said braking position.

6. In a sewing machine, stitching mechanisms having a needle which enters and is withdrawn from work during successive stitching cycles, a main drive operatively connected to normally power said stitching mechanisms including a driving means and a driven member selectively coupled in driving relation to each other only during operation of said driving means above a predetermined low rotational speed, a movable control, a needle positioner operatively connected to alternatively drive said driven member to power said stitching mechanisms during said low speed of rotation of said driving means of said main drive for moving said needle into a predetermined number of oriented needle positions relative to said work, said needle positioner including an auxiliary motor, an electrical circuit for said auxiliary motor including normally open switching means therein which in response to said predetermined low speed of rotation of said driving means of said main drive closes to partially complete said electrical circuit preparatory to energizing said auxiliary motor, plural auxiliary driven means on said driven member of said main drive in a number corresponding to said predetermined number of oriented needle positions, an auxiliary driving member operatively connected to be driven by said auxiliary motor and movable into a position adjacent to one of said auxiliary driven means and into and out of driving relation to said auxiliary driven means, said auxiliary driving member and said auxiliary driven means cooperating in one position relative to each other to establish an oriented needle position for said needle, means responsive to movement of said movable control completing said electrical circuit of said auxiliary motor and causing movement of said auxiliary driving member into a position adjacent one of said auxiliary driven means and into driving relation therewith, a brake, means mounting said brake for movement into and out of braking position relative to said driven member of said main drive, and means responsive to movement of said auxiliary driving member and said auxiliary driven means into said one position relative to each other to move said brake into said braking position.

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