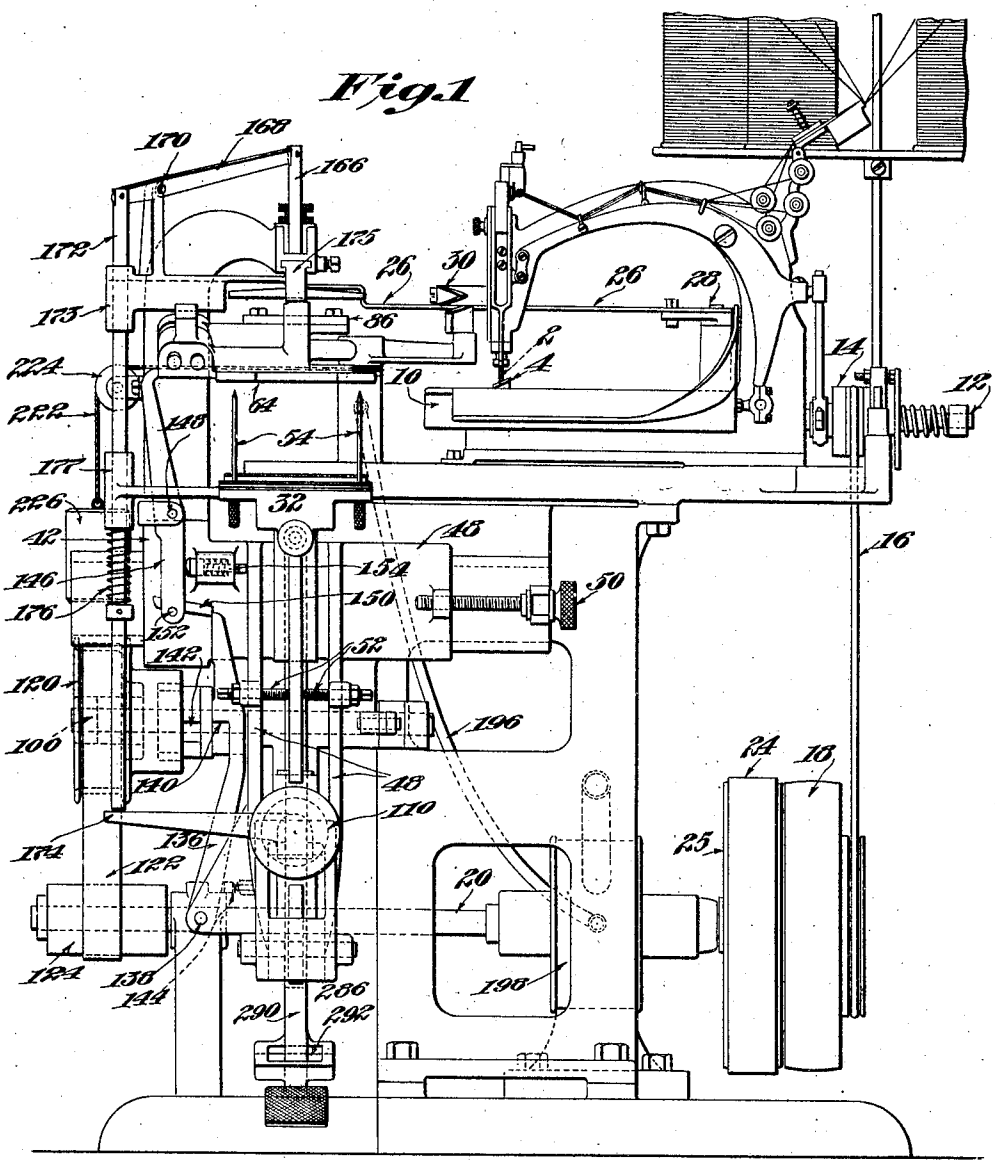
Dec. 18, 1928. 1,695,555

B. F. MAYO

MACHINE FOR OPERATING ON PIECES OF SHEET MATERIAL

Filed Oct. 28, 1920 6 Sheets-Sheet 1

Fig. 1



Inventor
Benjamin F. Mayo,
By C. A. Mason, Attorney

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B. F. MAYO

MACHINE FOR OPERATING ON PIECES OF SHEET MATERIAL

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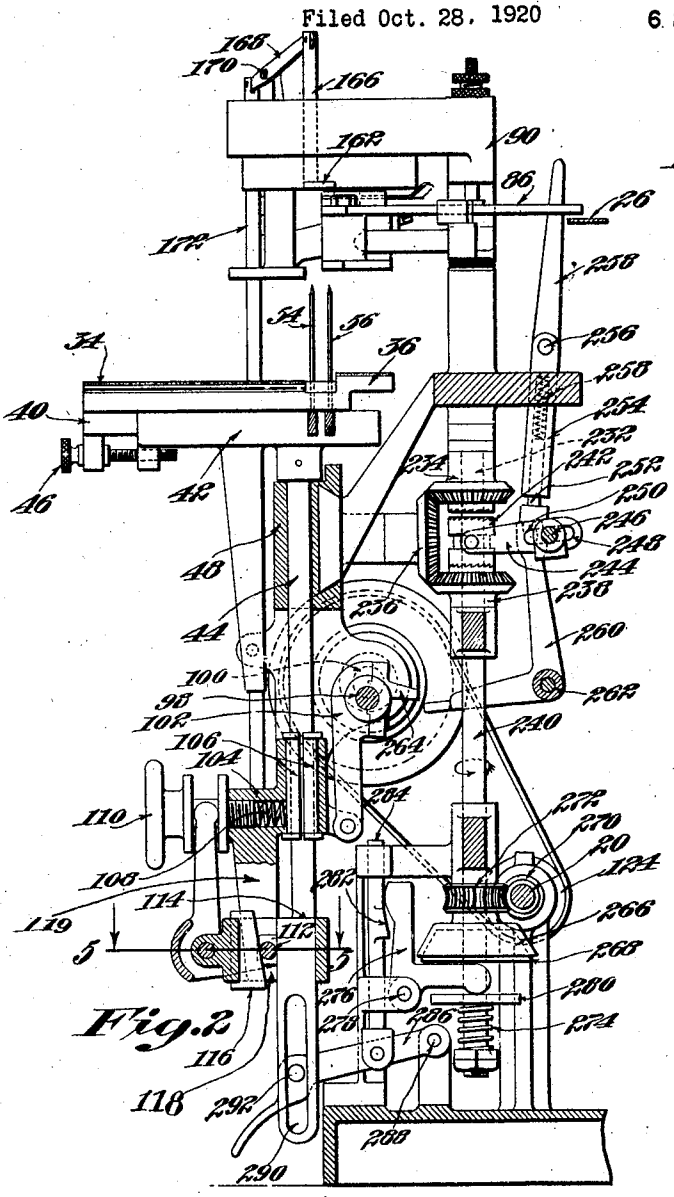


Fig. 2

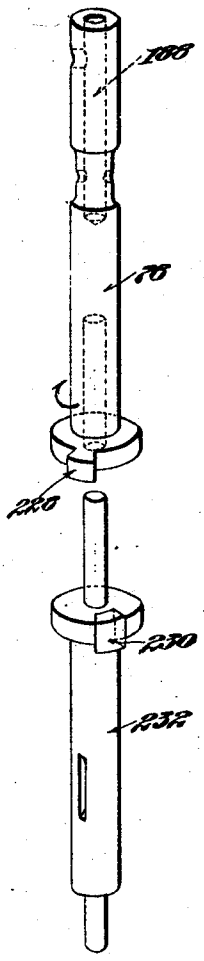


Fig. 3

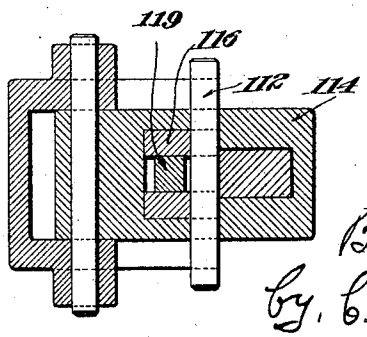


Fig. 5

Inventor
Benjamin F. Mayo
by C. A. Mason, Atty.

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B. F. MAYO

MACHINE FOR OPERATING ON PIECES OF SHEET MATERIAL

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Fig. 6

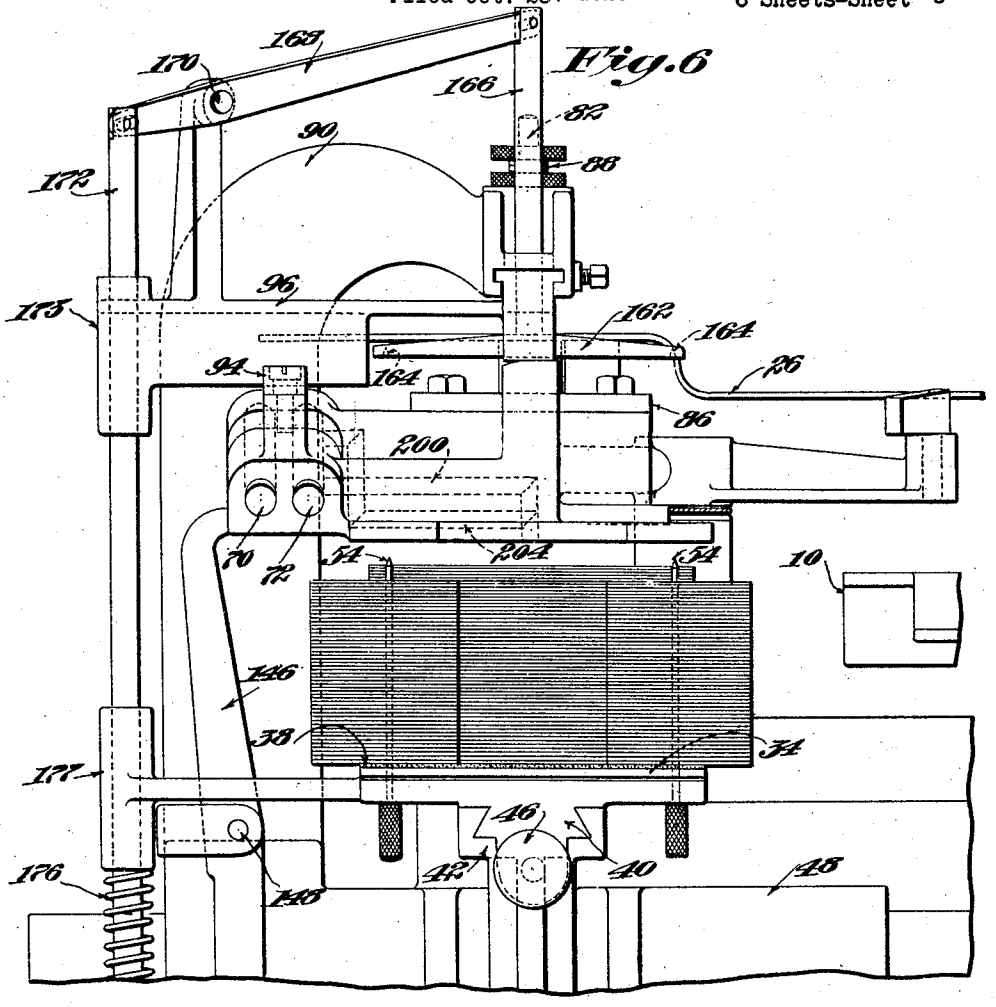
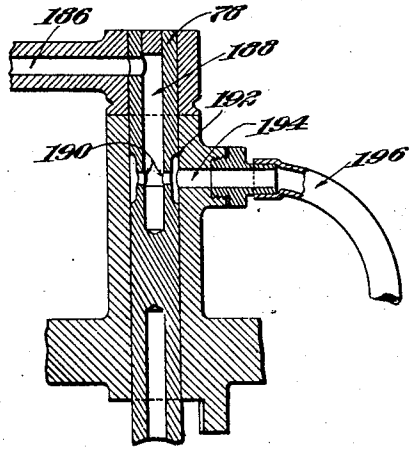


Fig. 9



Inventor
Benjamin F. Mayo.
by C. A. Mason, Attorney.

Dec. 18, 1928. 1,695,555

B. F. MAYO

MACHINE FOR OPERATING ON PIECES OF SHEET MATERIAL

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Fig. 7

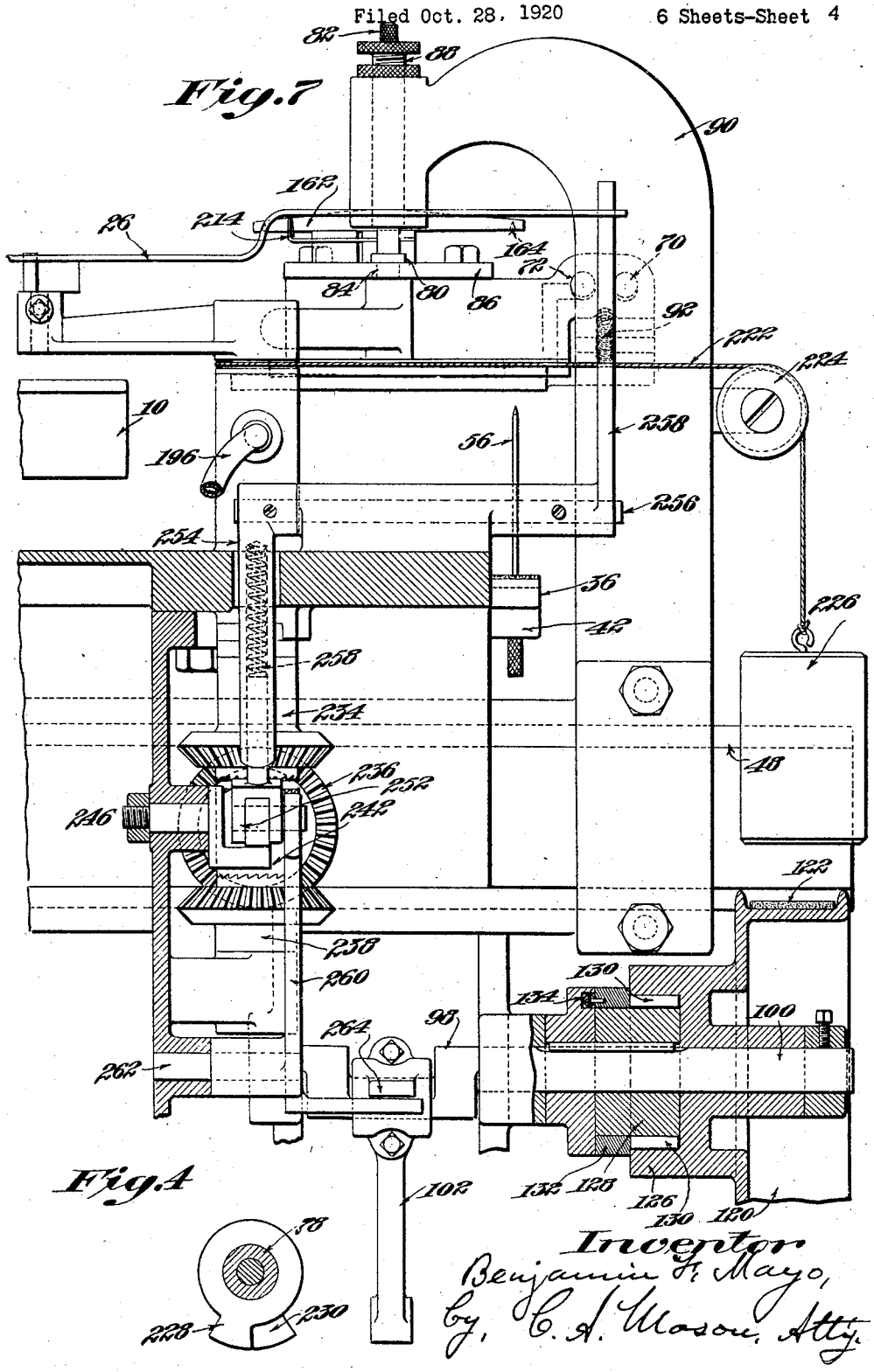


Fig. 4

Inventor
Benjamin F. Mayo,
by C. A. Mason, Atty.

Dec. 18, 1928. 1,695,555

B. F. MAYO

MACHINE FOR OPERATING ON PIECES OF SHEET MATERIAL

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Fig. 8

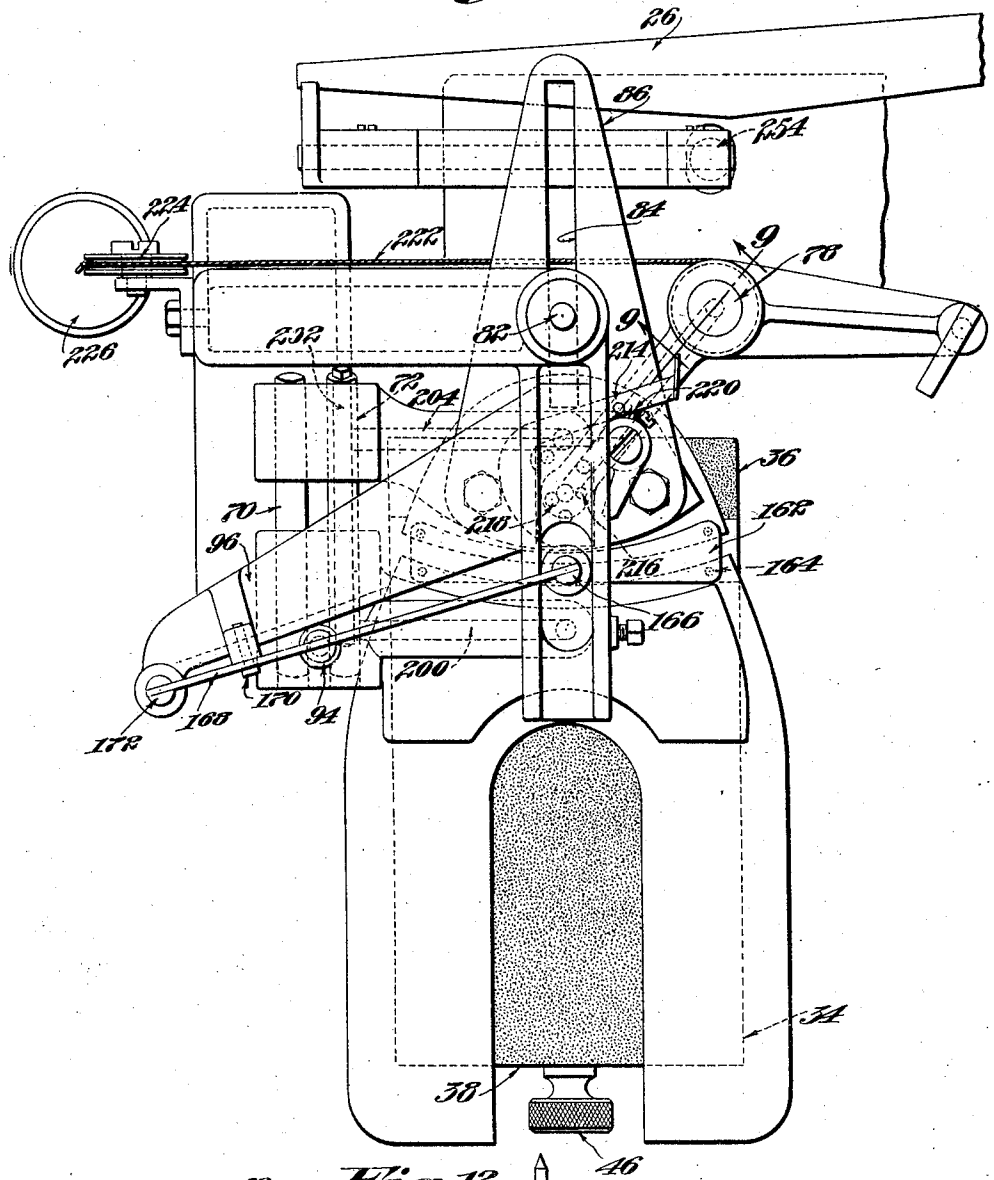
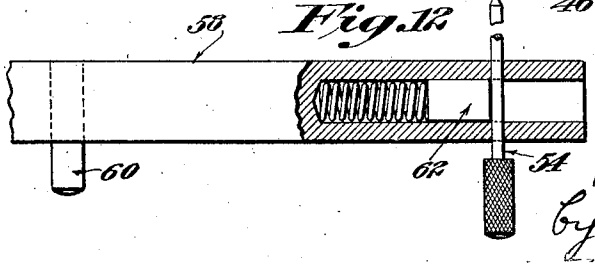


Fig. 12



Inventor
Benjamin F. Mayo,
by C. A. Mason, Atty.

Dec. 18, 1928. 1,695,555

B. F. MAYO

MACHINE FOR OPERATING ON PIECES OF SHEET MATERIAL

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Fig. 11

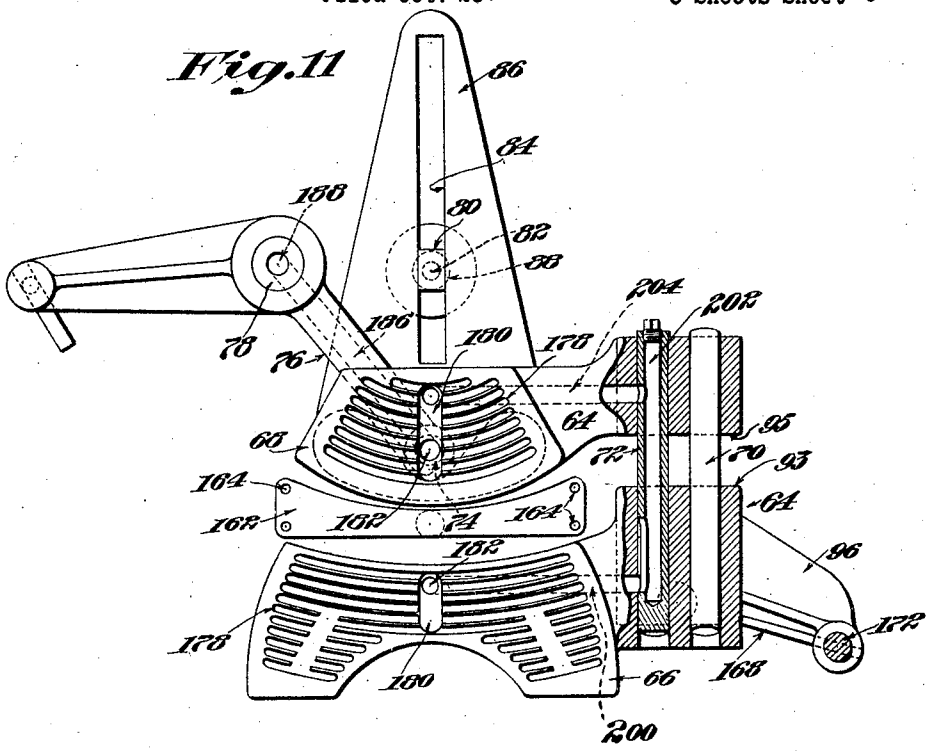
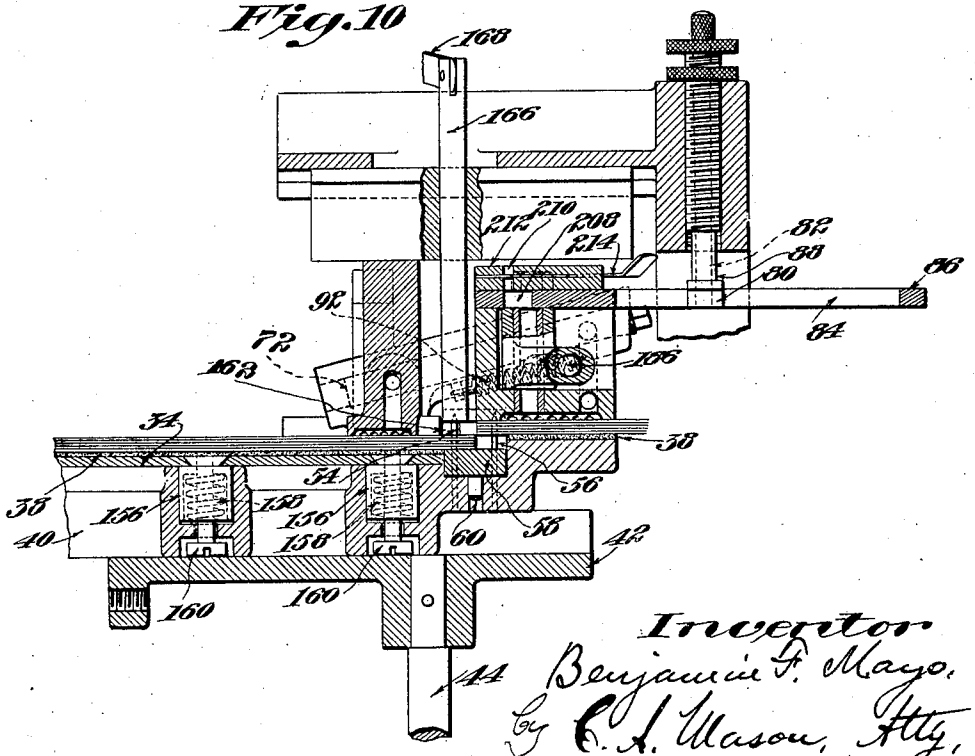


Fig. 10



Inventor
Benjamin F. Mayo.
By C. A. Mason, Atty.

Patented Dec. 18, 1928. 1,695,555

UNITED STATES PATENT OFFICE.

BENJAMIN F. MAYO, OF SALEM, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR OPERATING ON PIECES OF SHEET MATERIAL.

Application filed October 28, 1920. Serial No. 420,182.

This invention relates to machines for operating on sections of sheet material.

The invention is particularly designed to be embodied in machines for use in assembling and stitching together parts of a shoe upper. The assembling and stitching together of the parts of a shoe upper, in which operation the parts are first located in predetermined relative positions and then while held in such relations are guided in a predetermined path with relation to the sewing mechanism, in commercial work, have been hand operations, have taken a great deal of care and have required the services of a skilled operator. In applicant's pending application Serial No. 277,083, filed February 14, 1919, is illustrated a machine in which the parts of a shoe upper are first located in predetermined relative positions on an assembling table and are taken from the table by a movable carrier and presented to the sewing mechanism. This machine, while it greatly reduces the labor and time previously required in the operation and enables the operation to be successfully performed by an unskilled operator, requires the constant attention of the operator while in operation.

Certain important objects of the present invention are to improve the construction and mode of operation and to increase the output of machines for use in sewing together the parts of shoe uppers and to render such machines to a great degree automatic so that very little time and attention are required of the operator in operating the machines.

With this and other objects in view, the invention comprises the novel and improved features, constructions and combination of parts hereinafter described and particularly pointed out in the claims the advantages of which will be readily understood and appreciated by those skilled in the art.

While the invention is particularly designed to be embodied in machines for assembling and stitching together the parts of shoe uppers, certain features of the invention may be embodied with advantage in machines for stitching or otherwise securing together the parts of other articles. Certain features of the invention also may be employed in machines for performing certain operations on a single section of sheet material. It is to be understood, therefore, that except as defined in the claims the invention is not limited to any particular machine or class of machines.

The invention will be readily understood from the accompanying drawings illustrating the invention in its preferred form and the following detailed description of the constructions therein shown.

In the drawings, Figure 1 is a view in front elevation of a machine embodying the invention; Fig. 2 is a sectional view of the machine taken in planes substantially perpendicular to the main driving shaft and looking toward the left, Fig.1; Fig. 3 is a detail dissembled view in perspective of certain of the parts illustrated in Fig. 2; Fig. 4 is a detail view in horizontal section illustrating certain of the parts shown in Fig. 3; Fig. 5 is a detail sectional view taken substantially on the line 5—5 of Fig. 2; Fig. 6 is a view in front elevation of a portion of the machine; Fig. 7 is a view of a portion of the machine partly in rear elevation and partly in section; Fig. 8 is a detail plan view illustrating the supporting table, the carrier and certain associated parts; Fig. 9 is a detail sectional view taken substantially on the line 9—9 of Fig. 8; Fig. 10 is a view partly in side elevation and partly in section of certain of the parts shown in Fig. 8 looking toward the left; Fig. 11 is a detail underside plan view partly in section illustrating the carrier; and Fig. 12 is a view partly in front elevation and partly in section illustrating certain devices associated with the supporting table.

In the present machine two stacks of shoe upper parts to be assembled and stitched together are placed on a supporting table in predetermined relative positions, each stack containing parts of the same kind or contour. After the stacks of parts have been applied to the table the machine is started the parts are taken successively in sets, two parts at a time from the stacks by a movable carrier, are assembled in predetermined relative positions with their margins only overlapping and are then presented to the sewing mechanism. After the sewing operation is completed, the parts are discharged from the carrier and the carrier returns

to position to receive another set of parts from the stacks on the table. This cycle of operations is repeated until all of the parts are exhausted from the stacks and the machine is then stopped automatically.

The machine illustrated in the drawings is especially designed to be employed in stitching together a toe-cap or tip and a vamp. The machine has the same general construction and organization of parts as the machine illustrated and described in applicant's pending application Serial No. 277,083, refered to above.

The sewing mechanism of the machine illustrated in the drawing has the same construction as the sewing mechanism in the machine illustrated in the above application, and comprises one or more straight eyed needles 2, a presser-foot 4, and feeding devices (not shown) arranged to engage the parts of the work while it is being sewn. The machine is also provided with the usual work table 10. All of the operating parts of the sewing mechanism are actuated from a main shaft 12. The main shaft 12 is driven by means of a pulley 14 loosely mounted on the shaft and a belt 16 passing about the pulley 14 and about a grooved flange formed on a pulley 18 secured to a driving shaft 20 mounted in bearings in the base of the machine. The shaft 20 is driven from a suitable power shaft by a belt 24 which is shown in Fig. 1 as passing about a loose pulley 25 mounted on the shaft.

To enable the main shaft 12 to be started and stopped at suitable times, a friction clutch is provided for connecting the pulley 14 with the shaft which is controlled through suitable connections from an arm 26 pivoted at 28 on the frame. Before the parts of an upper are presented to the sewing mechanism, the arm 26 is swung rearwardly to engage the clutch and is latched in its rearward position by the engagement of a pivoted latch 30 with said arm. After the completion of the sewing operation, the latch 30 is lifted to release the arm 26, and the arm is then swung forwardly to cause the disengagement of the clutch by the action of a suitable spring.

As far as described, the present machine has the same construction, arrangement and mode of operation of parts as the machine illustrated and described in applicant's above application.

The machine is provided with a work supporting table indicated as a whole at 32, upon which stacks of the respective shoe upper parts to be assembled and attached together are placed. The table comprises a forward or outer section 34 for the reception of a stack of vamps and an inner or rear section 36 for the reception of a stack of tips, each section being provided with a covering of felt or other suitable fabric as indicated at 38. The table is mounted for forward and rearward and lateral adjustment and also for adjustment angularly to adjust the position in which the parts of an upper are applied to the carrier. The carrier, when in position to receive the parts of an upper, is located above the table and the table is mounted for vertical movement to transfer the parts to the carrier. The table is carried by a forwardly and rearwardly movable slide 40, mounted on a support 42 fixed to the upper end of a shaft 44, and is adjusted by means of an adjusting screw 46. The shaft 44 is mounted to slide vertically in bearings in a lateral movable slide 48 which is adjusted by means of an adjusting screw 50. The adjustment of the slide 40 adjusts the table forwardly and rearwardly relatively to the carrier. The support 42 is adjusted about the axis of the shaft 44 by means of adjusting screws 52, threaded into spaced arms on the slide 48 and arranged to engage the opposite sides of a depending arm on the support as shown in Figs. 1 and 2.

The carrier when in position to receive a set of upper parts from the table occupies a predetermined position with relation to the table. In order that the upper parts may be located in predetermined relation to each other, and may occupy predetermined positions on the carrier when applied to the carrier, the stacks of upper parts are placed in predetermined positions on the supporting table. To enable the stacks of parts to be located in this manner on the table the table is provided with a pair of gage pins 54 for insertion in holes made at predetermined points in the vamps and with a second pair of gage pins 56 for insertion in holes made at predetermined points in the tips. The gage pins 54 and 56 are mounted in a cross bar 58 engaging in a groove in the table and having a depending pin 60 engaged in a bore in the table. The pins 54 and 56 are slidable vertically in the cross bar 58 and are held frictionally in position by means of spring pressed plungers 62. The above manner of mounting the cross bar 58 enables the same to be removed from the table for the purpose of applying a series of vamps and tips respectively to the gage pins 54 and 56. When the vamps and tips have been stacked upon the gage pins the cross bar may be replaced in position on the table, the bar being located properly laterally of the table by the engagement of the pin 60 in the bore in the table. The gage pins 54 and 56 are relatively located so that when the vamps and tips have been applied thereto the forward edges of the vamps and the rear edges of the tips will be spaced a slight distance from each other as shown clearly in Fig. 8.

The carrier for carrying the parts of an

upper past the stitch forming mechanism and for guiding the same during the stitching of the parts together is indicated as a whole at 64. The carrier comprises an outer portion 66 for carrying a vamp, and an inner portion 68 for carrying a tip spaced from the outer portion and connected therewith by means of bars 70 and 72.

The carrier is pivotally mounted at 74 upon a supporting arm or link 76 fixed to the upper end of a shaft 78 mounted to turn in a bearing in the frame. The carrier is guided during its swinging movement by means of a block 80 pivoted on the lower end of a stud 82 and engaging in a slot 84 in a plate 86 secured to the body of the carrier. The stud 82 thus forms a variable or shifting fulcrum for the carrier, and the position of the carrier relative to said fulcrum is controlled by the supporting arm 76. The stud 82 is mounted in a sleeve 88 threaded into an overhanging arm 90 formed on the slide 48. The pivot of the supporting arm 76 is located between the stud 82 and the stitch forming mechanism, and the axis of the stud and the axis about which the supporting arm swings are preferably arranged so that a horizontal line intersecting these axes will pass through the stitch forming mechanism. With this construction as the carrier is swung past the stitch forming mechanism, this mechanism will describe an approximately circular arc on the parts of the upper supported on the carrier. The radius of this arc may be adjusted by adjusting the shaft 78 toward and from the stud 82. The parts are constructed and arranged so that the horizontal line intersecting the axis of the shaft 78 and that of the stud 82 is substantially parallel with the direction of movement of the slide 48. The stud 82 can be adjusted toward and from the shaft 78 by adjusting the slide 48.

The carrier 64 is arranged to be swung into a position over the supporting table 32 to receive a set of upper parts from the stacks on the table as shown in Fig. 8, a suitable stop determining the position of the carrier relative to the table. The parts are arranged so that as the carrier is swung over the table, it is located somewhat above the topmost vamp and tip on the stacks on the table and the table is then elevated to engage the topmost vamp and tip with the carrier. The vamp and tip thus brought into contact with the carrier are then held in engagement with the carrier by suction mechanism associated therewith and the supporting table is lowered to its original position.

The vamp carrying portion 66 of the carrier and the tip carrying portion 68 are relatively arranged so that when the carrier is swung into receiving position over the supporting table the lower face of the portion 66 lies considerably below the lower face of the portion 68. Thus when the table descends the tip held by the portion 68 will be located above the vamp held by the portion 66. As the carrier starts to swing toward the sewing mechanism, the part 66 of the carrier is moved toward the part 68 to place the forward margin of the vamp and the rear margin of the tip in overlapping relations with the vamp beneath the tip. To provide for this relative movement of the two parts of the carrier, the part 66 thereof is mounted to slide longitudinally of the bars 70 and 72 and is acted upon by a coiled spring 92 which tends to maintain the same in a position adjacent to part 68, the movement of the part 66 under the influence of the spring being limited by the engagement of a face 93 on the part 66 with a face 95 on the part 68.

When the carrier is swung into receiving position over the table, the part 66 is moved forwardly away from the part 68 by the engagement of a roll 94 mounted on the part 66 with the inclined forward face of an arm 96 on the slide 48. As the carrier starts to swing toward the sewing mechanism, the part 66 is carried toward the part 68 by the action of the spring 92. In order that the movement of the part 66 may bring the forward margin of the vamp into contact or substantially into contact with the rear margin of the tip, the bars 70 and 72 are inclined as shown in Fig. 10 so that the part 66 is moved upwardly as it is carried toward the part 68.

The supporting table is raised and lowered in the manner described by the vertical movement of the shaft 44 in its bearings in the slide 48. To compensate for the decrease in the heights of the topmost vamp and tip with relation to the table, as the parts are taken successively from the stacks on the table, the table is given a step-by-step upward movement. To insure the engagement of the topmost parts on each stack with the carrier during each vertical movement of the table, the table is given an upward movement somewhat in excess of that required to engage the parts with the carrier. The mechanism for moving the shaft vertically to raise and lower the table comprises a crank 98 formed on an intermittently rotating shaft 100, and a pitman 102 connecting the crank with a block 104 having an opening through which the shaft 44 passes. Surrounding the shaft within the opening in the block 104 are a pair of friction shoes 106 which are held yieldingly in engagement with the shaft by a coiled spring 108 interposed between the outer shoe and a screw 110 threaded into the block. The screw 110 is adjusted so that the friction between the shoes 106 and the shaft 44 is slightly more than sufficient to lift the shaft as the block 104 is moved up-

wardly. During the first half revolution of the shaft 100 from the position shown in Fig. 2, the shaft 44 will be elevated until the topmost vamp and tip are engaged with the carrier, thus limiting the upward movement of the table and shaft 44. The block 104 will then slide upwardly along the shaft 44 until the shaft 100 completes a half revolution. During the second half revolution of the shaft 100, the shaft 44 and the supporting table descend with the block 104. Before the shaft has completed a revolution, however, the downward movement of the shaft 44 is stopped with the table in a position above its former initial position a distance substantially equal to the thickness of the tip and vamp taken from the stacks.

The mechanism for thus arresting the downward movement of the shaft 44 comprises a clutch roll 112 mounted in an opening in a projection 114 on the slide 48 and engaging between a squared enlargement on the lower end of the shaft 44 and a wedged shaped block 116 secured in the projection 114. As the block 104 is elevated to lift the shaft 44 and the table, the clutch roll 112 is lifted by the engagement of a projection 118 on an arm 119 extending downward from said block with the roll. As the block 104 descends the roll 112 is engaged with the enlargement on the lower end of the shaft 44 and with the inclined face of the wedge 116 at a predetermined point in the downward movement of the block 104 thereby locking the shaft 44 from further downward movement, the block 104 continuing its downward movement independently of said shaft. The shaft 44 is thus moved downwardly a uniform distance from its uppermost position during each cycle. The uppermost positions of the shaft and table increase in height during each succeeding cycle by a distance equal to the thickness of the upper parts taken by the carrier during the preceding cycle so that a step-by-step upward movement is imparted to the shaft.

The shaft 100 is driven by means of a pulley 120 loosely mounted on the shaft and continuously driven by means of a belt 122 from a pulley 124 mounted on the driving shaft 20. The pulley 120 is normally disconnected from the shaft 100 and the shaft is held stationary by suitable friction devices. When the carrier, however, is swung into receiving position over the supporting table, the shaft 100 is clutched to the pulley 120 by means of a roll or Horton clutch and is driven from the pulley through a single revolution to elevate and depress the supporting table. When the shaft has described a single revolution the clutch is thrown out and the shaft again comes to rest. The clutch for connecting the pulley 120 with the shaft 100 is of well-known construction and comprises a driving member 126 carried by the pulley, a driven member 128 fixed to the shaft, a series of clutch rolls 130, a clutch controlling member 132 and a clutch engaging spring 134. The engagement and disengagement of the clutch is controlled by means of a controlling lever 136 pivoted at 138 on the slide 48 and provided with an abutment 140 arranged to engage a projection 142 on the clutch controlling member 132 to hold the clutch out of engagement. The controlling lever 136 is normally held in position to maintain the clutch out of action by means of a spring pressed plunger 144.

The controlling lever 136 is swung to the right, Fig. 1, to disengage the abutment 140 from the projection 142 thereby throwing the clutch into action by means of a tripping lever 146 pivoted at 148 on an arm on the support 42, the upper end of which lever is arranged to be engaged by the carrier 64 as shown clearly in Fig. 1. A dog 150 for engagement with the upper end of the controlling lever 136 is pivoted at 152 on the tripping lever and is normally held by gravity with its right hand end in position to engage the controlling lever, the downward movement of the right hand end of the dog being limited by a suitable stop on the tripping lever. As the carrier is swung into receiving position over the supporting table, the upper end of the tripping lever is engaged by the carrier and the lever is actuated to swing the lower end thereof to the right. The controlling lever 136 is thus swung to the right to throw the roll clutch into operation.

When the supporting table is elevated the upward movement of the tripping lever 146 carries the dog 150 above the upward end of the controlling lever 136, allowing the latter lever to be swung back to its initial position by the spring pressed plunger 144 so that the roll clutch will be thrown out of operation when the shaft 100 has executed a single revolution. As the supporting table is depressed, the right hand end of the dog 150 engages the upper end of the controlling lever and is swung upwardly. When the carrier 64 starts to swing toward the stitch forming mechanism, the tripping lever is restored to its initial position by a spring pressed plunger 154 and the right hand end of the dog 150 then drops down into active position.

In order to insure that the topmost tip and vamp will both be brought firmly into contact with the carrier by the upward movement of the supporting table, the vamp supporting section 34 of the table is arranged somewhat closer to the portion 66 of the carrier than the tip carrying section 36 of the table is to the portion 68 of the carrier and the section 34 is yieldingly mounted. The section 34 of the table is mounted upon

hollow guide studs 156 engaging in guides in the slide 40, and is yieldingly supported by coiled springs 158, the upward movement of the section 34 relatively to the slide being limited by stop screws 160.

The gage pins 54 and 56 are liable to be deflected out of their proper positions especially when the stacks or vamps and tips are applied thereto. This will cause the parts to be improperly located with relation to each other and to the carrier when applied to the carrier with the result that relative positions of the parts when attached together will not be correct and the seam will be improperly located. In order that the vamps and tips may be readily taken in succession from the gage pins, it is desirable that the gage pins should project as little as possible above the topmost vamp and tip. The present machine is provided with a device which engages the upper ends of the gage pins as the supporting table is elevated, locates the pins in their proper positions with relation to the carrier before the vamp and tip are engaged with the carrier and also acts to depress the gage pins relatively to the table to compensate for the diminution in the heights of the stacks of parts as the parts are taken from the table by the carrier. This device is indicated in the drawings at 162 and consists of a plate provided with a series of tapered recesses 164 arranged to receive the tapered upper ends of the gage pins. Before the elevation of the table to apply the parts to the carrier, the plate 162 occupies the position shown in Fig. 2. When the supporting table is elevated the plate 162 is depressed into the position shown in Fig. 10. During this relative movement of the table and plate, the upper ends of the gage pins 54 and 56 are engaged in the recesses 164, are located in the proper positions and are depressed through the cross bar 58 to the positions shown in Fig. 10 with relation to the topmost vamp and tip. In order that the plate 162 may not interfere with the movement of the carrier as the carrier swings toward the sewing mechanism, the plate is lifted out of the way of the carrier to the position shown in Fig. 2 as the supporting table descends. The plate is secured to the lower end of a rod 166 mounted to slide vertically in an arm on the slide 48, to the upper end of which rod is pivotally connected one arm of a lever 168 pivoted at 170 on said slide. The other arm of the lever 168 is pivotally connected with the upper end of a rod 172 mounted for vertical movements in guides in the slide 48, the lower end of which is arranged to be engaged by an arm 174 on the block 104. Through the engagement of the arm 174 with the rod 172 as the block 104 is raised to elevate the supporting table, the plate 162 will be depressed into the position shown in Fig. 10. As the block 104 is depressed the plate 162 is lifted by the action of a coiled spring 176. The topmost shoe upper parts applied to the carrier by the upward movement of the table are held on the carrier as the table descends by the action of suction mechanism. To enable the shoe upper parts engaged with the lower surfaces of the parts 66 and 68 of the carrier to be held by suction thereon, these parts of the carrier are formed with a series of parallel grooves 178, with a traverse groove 180 intersecting the parallel grooves and with a bore or passageway 182 communicating with the latter groove as shown in Fig. 11. The bore 182 connected with the groove 180 in the part 68 of the carrier is formed in the stud 74 and communicates by means of a passageway 186 in the arm 76 with a bore 188 in the shaft 78. The shaft 78 is formed with a series of radial openings 190 leading from the central bore in the shaft to a shallow groove 192 in the periphery of the shaft. The groove 192 communicates through a passageway 194 in the frame with one end of a flexible pipe 196 the other end of which is connected with a suction fan 198 driven from the driving shaft 20. The bore 182 in the part 66 of the carrier communicates with the groove 180 in the part 68 by means of a passageway 200 in the part 66 of the carrier, a bore 202 in the bar 72 and a passageway 204 in the part 68. The bore 182 in the stud 74 is extended through the upper end of the stud and communicates by means of an opening 208 in the plate 86 with an opening 210 in a block 212 secured to said plate. The opening 210 is normally closed by means of a lever 214 pivoted at 216 in a slot in the block 212.

The lever 214 controls the suction mechanism during the operation of the machine. The lever is formed with an opening 218 adapted to be brought into registration with the opening 210. The lever is normally held in position to close the opening 210 by a coiled spring 220. As the carrier swings past the sewing mechanism the up-turned end of the lever 214 engages with the arm 26 just after the completion of a seam and the lever is swung into position to bring the opening 218 into registration with the opening 210 thereby relieving the suction by which the upper parts are held on the carrier and allowing these parts to fall from the carrier. As the carrier swings back into work receiving position, the lever 214 is actuated by the spring 220 to close the opening 210 and thereby restore the suction mechanism to operation.

The carrier 64 is swung back and forth successively from work receiving position over the supporting table past the sewing mechanism to work discharging position and then back to work receiving position by auto-

matically acting mechanism. The carrier is swung from work receiving position over the supporting table past the sewing mechanism to work discharging position by means of a cable 222 secured at one end to the central portion or hub of the arm 76 and extending therefrom over a pulley 224 and by a weight 226 secured to the other end of the cable. This mechanism for swinging the carrier allows the movement of the work and carrier to be controlled by the work engaging feeding devices during the sewing operation. The carrier is swung in the opposite direction from work discharging position to work receiving position by imparting rotary movement to the shaft 78. To the lower end of the shaft 78 is secured a disk having a radial projection 228 arranged to be engaged by the upper end of a similar projection 230 formed on a disk secured to a shaft 232. A bevel gear 234 is mounted to turn loosely on the shaft 232 and is connected by means of a bevel gear 236 with a bevel gear 238 secured to a shaft 240. The shaft 240 is constantly rotated in the direction of the arrow, Fig. 2, during the operation of the machine, and the gears 234 and 238 are thus driven in opposite directions. A clutch member 242 is keyed to the shaft 232 but is movable longitudinally of the shaft and is formed upon its upper and lower ends with clutch teeth respectively for engagement with clutch teeth on the gear 234 and with clutch teeth on the gear 236. The clutch member 242 is shifted longitudinally of the shaft 232 by means of a lever 244 pivoted at 246 on the frame and having a slot 248 in which is engaged a pin 250 carried at the lower end of a rod 252. The rod 252 is mounted for longitudinal movement in an arm 254 secured to a rock shaft 256 and the rod is acted upon by a coiled spring 258 which tends to force the rod downwardly in the arm. When the work is applied to the carrier the pin 250 is located in the forward or left hand end of the slot 248 as shown in Fig. 2 and the shaft 232 is clutched to the gear 238. The shaft 232 is thus driven by the gear in the direction of the arrow. The shaft 78 however is not driven by the shaft 232 in this direction but its rotation is merely controlled by the engagement of the projection 228 with the projection 230. When the seam has been completed and the parts released from the carrier, the arm 254 is swung rearwardly as the arm 26 is released by the latch 30 by the engagement of the arm 26 with an arm 258 secured to the rock shaft 256. This movement of the arm 254 carries the pin 250 into the rear end of the slot 248 and the lever 244 is actuated to shift the clutch member 242 into engagement with the clutch teeth on the gear 234. The direction of rotation of the shaft 232 is thus reversed and the shaft 78 is driven from the shaft 232 through the engagement of the projection 230 with the projection 228 in the direction of the arrow in Fig. 3 to restore the carrier to work receiving position. When the carrier reaches work receiving position the pin 250 is shifted back to the forward end of the slot 248 thereby again reversing the direction of rotation of the shaft 232.

The shifting of the pin to the forward end of the slot in this manner is produced by the movement of a bell crank lever 260 pivoted at 262 and having a slot at the end of its vertical arm in which the pin 250 engages. The horizontal arm of the lever 260 is arranged to be engaged by a projection 264 on the pitman 102 and the bell crank lever is thereby actuated to shift the pin 250 into the forward end of the slot 248.

The shaft 240 is driven from the shaft 20 through a friction clutch which comprises a driving clutch member 266 loosely mounted on the shaft 240 and a driven clutch member 268 fixed to rotate with the shaft 240 but movable longitudinally of the shaft into and out of engagement with the driving clutch member. The driving clutch member 266 is continuously driven from the shaft 20 through a worm 270 and worm wheel 272. The driven clutch member is normally held in engagement with the driving clutch member by means of a coiled spring 274. The engagement of the driven clutch member with the driving clutch member is controlled by means of a bell crank lever 276 pivoted at 278, the horizontal arm of which is arranged to engage a flange 280 on the driven clutch member. The vertical arm of the bell crank lever 276 is arranged to be engaged by an inclined projection 282 on a vertically movable rod 284, the lower end of which is pivotally connected with a treadle lever 286 pivoted at 288. When the treadle lever is depressed the projection 282 is disengaged from the bell crank lever 276 and the driven clutch member 268 is held by the spring 274 in engagement with the driving clutch member 266 so that the shaft 240 is continuously rotated. When the treadle lever is elevated the projection 282 is engaged with the vertical arm of the bell crank lever 276 and the bell crank lever is thus held in position to maintain the clutch member 268 out of engagement with the clutch member 266. When the machine is at rest the treadle lever is elevated and the clutch members are held out of engagement. With parts in this condition after a stack of vamps and a stack of tips have been applied to the supporting table the treadle lever is depressed by the operator to start the machine. When the last vamp and tip are taken from the stacks on the supporting table, the treadle lever is lifted to engage the projection 282 with the bell crank lever and thereby disengage the

clutch member 268 from the clutch member 266. The enlargement on the lower end of the shaft 44 is formed with a slot 290 in which engages a pin 292 carried by the treadle lever and the lever is lifted at this point in the operation of the machine by the upward movement of the shaft 44 as the parts are exhausted from the stacks on the table. After other stacks of parts have been placed on the table the machine is started by the depression of the treadle lever 286.

What is claimed is:

1. A machine for operating on sections of sheet material, having, in combination, means for operating on such material, a carrier for sections of such material movable from work receiving position to present the work to the operating means, movable to guide the work in its movement during the operation thereon and movable to restore the carrier to work receiving position after the completion of an operation and automatically actuated and controlled mechanism for imparting a complete cycle of movements to the carrier.

2. A machine for operating on sections of sheet material, having, in combination, means for operating on such material, a carrier for sections of such material movable from work receiving position to present the work to the operating means, movable to guide the work in its movement during the operation thereon and movable to restore the carrier to work receiving position after the completion of an operation and automatically actuated and controlled mechanism for imparting repeated cycles of movements to the carrier.

3. A machine for operating on sections of sheet material having, in combination, means for progressively operating along such material, a carrier for holding sections of such material during the operation thereon movable from work receiving position to present the work to the operating means and back to work receiving position after the completion of an operation, and automatically actuated and controlled mechanism for imparting a complete cycle of movements to the carrier.

4. A machine for operating on sections of sheet material, having in combination, means for operating on such material, means for supporting a group of sections of such material to be operated upon, and means operating to take said sections in succession from the supporting means and present the same to the operating means arranged to control each section during the progressive operation thereon of the operating means.

5. A machine for operating on sections of sheet material, having, in combination, means for operating on such material, means for supporting a group of sections of such material to be operated upon and means operating to take said sections in succession from the supporting means and present the same to the operating means arranged to guide each section with relation to the operating means as the point of operation is transferred along the section during the operation.

6. A machine for operating on sections of sheet material, having, in combination, means for operating on such material, means for supporting a group of sections of such material to be operated upon and a movable carrier operating to take said sections in succession from the supporting means and present the same to the operating means arranged to control each section during the progressive operation thereon of the operating means.

7. A machine for operating on sections of sheet material, having, in combination, means for operating on such material, a support for a group of sections of such material, a movable carrier for taking the sections in succession from the support and presenting the same to the operating means arranged to control each section during the progressive operation thereon of the operating means and automatically actuated and controlled mechanism for causing the transfer of the sections from the support to the carrier and automatically actuated and controlled mechanism for operating the carrier.

8. A machine for operating on sections of sheet material, having, in combination, means for operating on such material, means for supporting a group of sections of such material to be operated upon, mechanism for taking the sections in succession from the supporting means and presenting the same to the operating means arranged to control each section during the progressive operation thereon of the operating means and to discharge said sections after the completion of the operation and automatically actuated and controlled mechanism for producing repeated cycles of operation of said mechanism.

9. A machine for operating on sections of sheet material, having, in combination, a table for holding a stack of sections of such material, a movable carrier arranged to receive the sections in succession from the stack on the table and movable to present the work to the operating means, movable to guide the work in its movement during the operation thereon and to discharge the work after the completion of an operation, means acting to cause the transfer of the sections from the table to the carrier, and mechanism for actuating the carrier.

10. A machine for operating on sections of sheet material, having, in combination, a table for holding a stack of sections of such material, a movable carrier arranged to receive the sections in succession from the stack on the table and movable to present the work to the operating means, movable to

guide the work in its movement during the operation thereon and to discharge the work after the completion of an operation and mechanism acting to relatively move the table and carrier to apply the topmost section in the stack to the carrier.

11. A machine for operating on sections of sheet material, having, in combination, a table for holding a stack of sections of such material, a movable carrier arranged to receive the sections in succession from the stack on the table and movable to present the work to the operating means, to guide the work during the operation thereon and to discharge the work after the completion of an operation, suction mechanism for holding the sections in position on the carrier, and mechanism for actuating the carrier and controlling the suction mechanism.

12. A machine for operating on sections of sheet material having, in combination, means for operating on such material, assembling means acting to relatively move two sections of such material to position them with their margins overlapping, and mechanism for actuating the assembling means to present the overlapping margins progressively to the operating means.

13. A machine for securing together two sections of sheet material, having, in combination, fastener inserting mechanism and a movable carrier arranged to assemble two sections of such material in predetermined relative positions with their margins only overlapping and present the overlapping margins of said sections to the fastener inserting mechanism.

14. A machine for securing together two sections of sheet material, having, in combination, fastener inserting mechanism, a support for sections to be assembled and secured together and a movable carrier arranged to take two sections from said support, assemble the two sections in predetermined relative positions with their margins only overlapping and present the overlapping margins of said sections to the fastener inserting mechanism.

15. A machine for securing together two sections of sheet material, having, in combination, fastener inserting mechanism, a work support, means for locating two sections of such material in predetermined relative non-overlapping positions on said support, means for taking the two sections from the support and assembling the same in predetermined relative positions with their margins only overlapping and presenting the overlapping margins of said sections to the fastener inserting mechanism.

16. A machine for securing together two sections of sheet material, having, in combination, fastener inserting mechanism, a work support, means for locating two sections of such material in predetermined relative non-overlapping positions on the support and a movable carrier arranged to take two sections from the support, assemble the same in predetermined relative positions with their margins only overlapping and present the overlapping margins of said sections to the fastener inserting mechanism.

17. A machine for securing together sections of sheet material, having, in combination, fastener inserting mechanism, a support for one or more groups of sections of such material, means operating successively to take two sections from the support, assemble the same in predetermined relative positions with their margins only overlapping and present the overlapping margins thereof to the fastener inserting mechanism.

18. A machine for operating on the parts of shoe uppers, having, in combination, operating means, a magazine, and means arranged to take the parts in succession from the magazine, carry the same in a predetermined path from the magazine past the operating means so that the operating means follows a line substantially parallel with an edge of each of the parts and to discharge the parts after the completion of an operation.

19. A machine for operating on the parts of shoe uppers, having, in combination, operating means, a magazine, means arranged to take the parts in succession from the magazine, carry the same in a predetermined path past the operating means so that the operating means follows a line substantially parallel with an edge of each of the parts and to discharge the parts after the completion of an operation, and automatically actuated and controlled mechanism for actuating said taking and carrying means.

20. A machine for stitching together the parts of shoe uppers, having, in combination, sewing mechanism, a magazine, and means operating to take two parts from the magazine, to assemble the same in predetermined relative positions, to carry the same in a predetermined path past the sewing mechanism so that a seam is formed on a line substantially parallel with an edge of each of the parts and to discharge the parts after the completion of the sewing operation.

21. A machine for stitching together the parts of shoe uppers, having, in combination, sewing mechanism, a magazine, means operating to take two parts from the magazine, to assemble the same in predetermined relative positions, to carry the same in a predetermined path past the sewing mechanism

so that a seam is formed on a line substantially parallel with an edge of each of the parts and to discharge the parts after the completion of the sewing operation, and automatically actuated and controlled mechanism for actuating said means.

22. A machine for sewing together the parts of shoe uppers, having, in combination, sewing mechanism, a magazine, means operating to take the parts from the magazine, to assemble the same in predetermined relative positions with their margins only overlapping, to carry the same in a predetermined path past the sewing mechanism so that a seam is formed through the overlapping margins thereof on a line substantially parallel with an edge of one of the parts and to discharge the parts after the completion of the sewing operation.

23. A machine for sewing together parts of shoe uppers, having, in combination, sewing mechanism, a support for holding two parts of an upper, and means arranged to take the parts from said support, to assemble the same in predetermined relative positions, and to carry the same past the sewing mechanism so that a seam will be formed on a line parallel with an edge of one of the parts.

24. A machine for sewing together parts of shoe uppers, having, in combination, sewing mechanism, a magazine for holding stacks of vamps and tips, gaging devices for locating the stacks in predetermined relative positions, and means arranged to take a vamp and a tip from the stacks in the magazine, to assemble the same in proper overlapping relation, to carry the same in a predetermined path past the sewing mechanism so that a seam will be formed through the overlapping margins of the parts on a line parallel with an edge of one of said margins and to discharge the same after the completion of the sewing operation.

25. A machine for sewing together the parts of shoe uppers, having, in combination, sewing mechanism, means for supporting a vamp and a tip in predetermined relative positions, means arranged to take the vamp and tip from the supporting means, to assemble the same in proper overlapping relation, and to carry the same in a predetermined path past the sewing mechanism so that a seam will be formed through the overlapping margins on a line substantially parallel with an edge of one of said margins.

26. A machine for operating on sections of sheet material, having, in combination, means for operating on such material, a table for holding a stack of sections of such material, a carrier movable over the table and means for imparting a step-by-step upward movement to the table in successive cycles of operations to apply the topmost section on the stack to the carrier in each cycle.

27. A machine for operating on sections of sheet material, having, in combination, means for operating on such material, a reciprocatory swinging carrier for presenting sections of such material to the operating means, a shaft for controlling the movement of the carrier, and automatically acting mechanism for rotating the shaft alternately in reverse directions.

28. A machine for operating on sections of sheet material, having, in combination, means for operating on such material, a table for supporting a stack of sections of such material, gage pins for insertion in gaging holes in the sections removably mounted on the table and means for taking the sections in succession from the stack and presenting the same to the operating means.

29. A machine for operating on sections of sheet material having, in combination, means for operating on such material, a carrier provided with devices for supporting a plurality of sections of such material, relatively moving them edgewise into overlapping relation and retaining them in such relation during the operation of the operating means thereon.

30. A machine for sewing together parts of shoe uppers having, in combination, sewing mechanism, means for supporting two parts of an upper, and means arranged and operated to take the parts, move them edgewise with relation to each other into overlapping relation, and retain them in this relation during the operation thereon of the sewing mechanism.

31. A machine for sewing together parts of shoe uppers having, in combination, sewing mechanism, means for supporting a vamp and a toe tip and a carrier provided with devices operating to take the vamp and toe tip, assemble them in proper overlapping relation and retain them in this relation during the operation of the sewing mechanism thereon.

32. A machine for sewing together parts of shoe uppers having, in combination, sewing mechanism, a carrier provided with devices for holding a vamp and a toe tip, relatively moving them edgewise into overlapping relation, and retaining them in this relation during the operation of the sewing mechanism thereon.

33. A machine for sewing together parts of shoe uppers having, in combination, sewing mechanism, magazines for holding the stacks of vamps and toe tips, a carrier provided with devices for taking a vamp and a toe tip from the magazines relatively movable to assemble said pieces, mechanism for actuating the carrier to take and assemble the vamp and toe tip and to present them

to the sewing mechanism while retaining them in assembled relation.

34. A machine for operating on sections of sheet material having, in combination, means for operating on the material, a two-part carrier having each of its parts arranged to support a different section of such material, means for relatively moving the parts of the carrier to assemble the sections, and means for relatively moving the carrier and operating means to determine the line of travel of the operating means along the assembled sections.

BENJAMIN F. MAYO.