Feb. 27, 1923.

1,446,473

F. L. MACKENZIE

FASTENING INSERTING MACHINE

Filed Feb. 21, 1922

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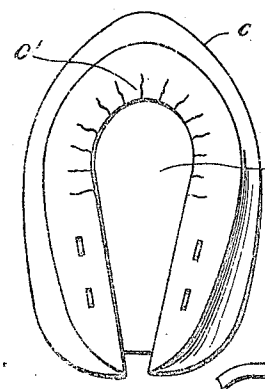


Fig. 4

Fig. 1

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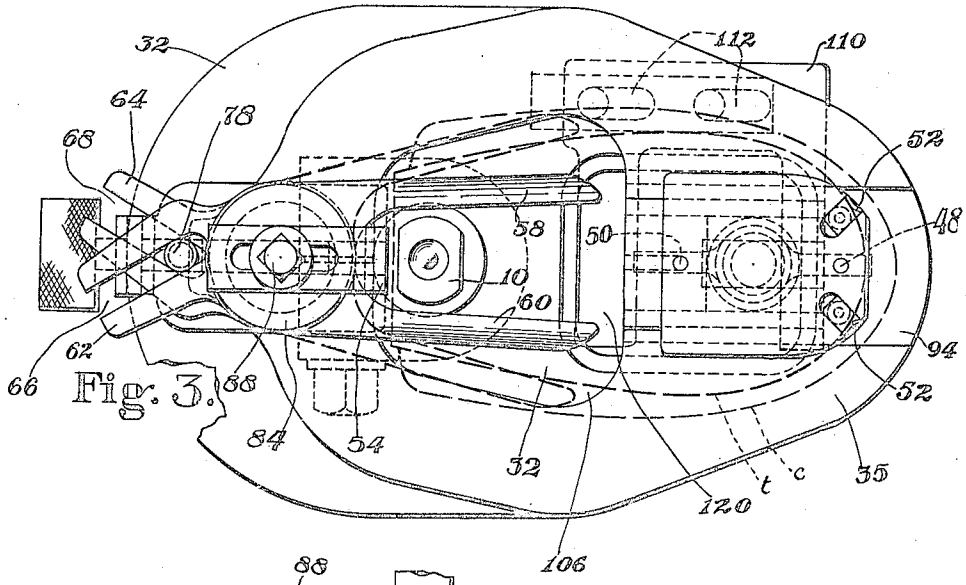


Fig. 3.

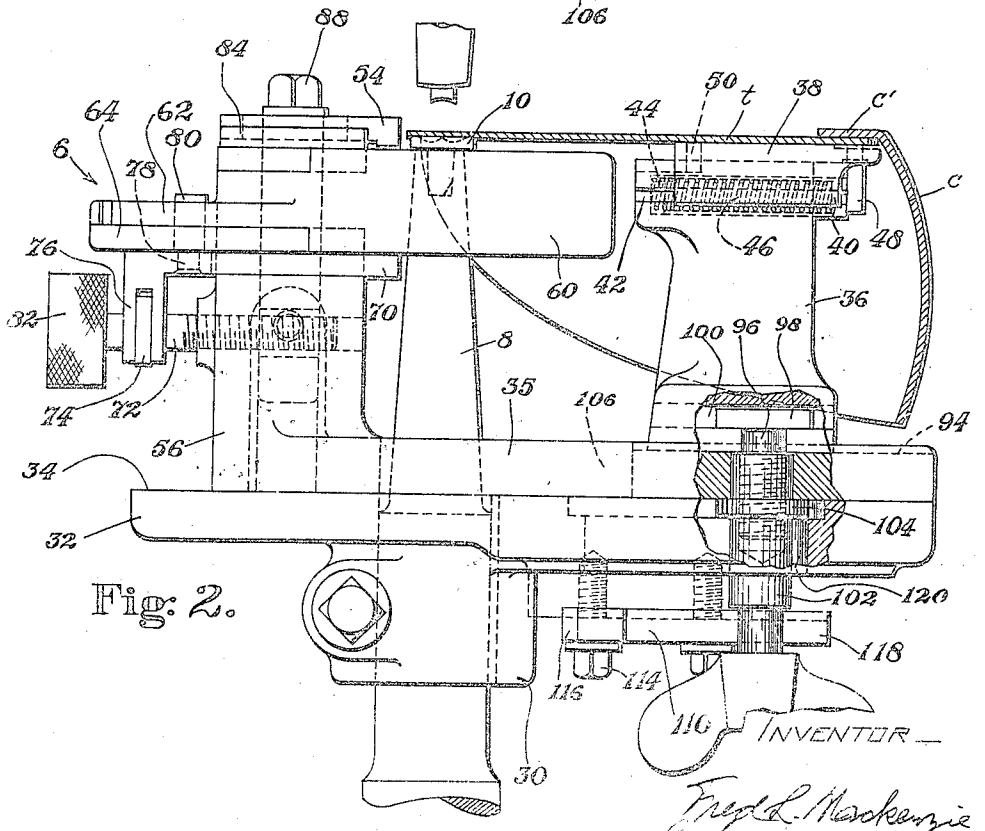


Fig. 2.

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Patented Feb. 27, 1923. 1,446,473

UNITED STATES PATENT OFFICE.

FRED L. MACKENZIE, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

FASTENING-INSERTING MACHINE.

Application filed February 21, 1922. Serial No. 538,326.

To all whom it may concern:

Be it known that I, FRED L. MACKENZIE, a citizen of the United States, residing at Beverly, in the county of Essex and State of Massachusetts, have invented certain Improvements in Fastening-Inserting Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to fastening inserting machines and more particularly to work supports therefor which are operable to position pieces of work relatively to each other and to present the assembled work in position for fastening inserting operations.

In one aspect the invention resides in a fastening inserting mechanism comprising means for clinching the fastenings simultaneously with their insertion into the work and a work support mounted for universal movement in a given plane to present the work over the clinching means for the insertion of fastenings spaced to secure together the portions of the work.

In the illustrative machine the horn of the fastening inserting mechanism carries a work support movable horizontally in all directions to present the work successively in a plurality of fastening inserting positions, means being provided for controlling the movement of the work support relatively to the horn.

The illustrated machine is designed more especially for securing together a counter and a tuck and for positioning these parts relatively to each other as a preliminary to the operation of the fastening inserting means. One of the difficulties heretofore encountered in positioning the tuck in the counter resides in the fact that, if sufficient care were not exercised, the tuck would rise upon the inner convexly curved surface of the counter to such an extent as to be displaced away from the flanges of the counter so that an imperfect article was not infrequently produced as a result of the parts being secured in the described relation. To overcome this difficulty, there is provided on the supporting member for the tuck a member or members for spacing the rear end of the tuck from the adjacent curved surface of the counter, the said member or members serving also, in the illustrative construction, as a gage or gages for locating the tuck along both its longitudinal and transverse axes with respect to the fastening inserting mechanism.

As shown, gages are provided for the front end of the tuck and for the counter, the gages serving among other purposes to position the front end of the counter in a transverse direction with respect to the front end of the tuck. Conveniently the gages for the tuck and counter are mounted on a member which is movable with the supporting member for the tuck and counter. Preferably the counter gages are so mounted as to be simultaneously adjustable to an equal extent in opposite directions, thereby providing for gaging operations on counters of different sizes so that all counters may be accurately positioned in a transverse direction with respect to their associated tucks.

Other important features of the invention, including combinations of parts and details of construction, will be described in the specification and pointed out in the appended claims.

In the drawings:—

Figure 1 is a view in side elevation of a machine showing one embodiment of the invention;

Fig. 2 is an enlarged detail view of the work support;

Fig. 3 is a plan view of the mechanism shown in Fig. 2; and

Fig. 4 is a bottom plan view of the counter with the tuck secured in place.

In the illustrating machine there is provided a fastening inserting mechanism 4 which is operative to insert fastenings into the work presented by the work support 6, the said inserting mechanism being preferably, though not necessarily, a stapling machine of the type shown in Patent No. 1,016,930, granted February 13, 1912, on application of W. H. Borden. As shown, the staple fastening mechanism 4 is provided with a horn 8 having at its upper end a fastening clinching block 10. For operating the horn in proper timed relation to the fastening inserting mechanism, connections are provided between the horn and the cam wheel 12 on the main shaft 14, the said connections comprising a lever 16 pivoted at 18 in the frame of the machine and having an operative connection with the horn 8 as

indicated at 20. Passing through the rear end of the lever 16 is a rod 22 provided with a collar (not shown) between which and the washer 24 is a spring 26, the arrangement being such that during the downward movement of the rod 22 the rear end of the lever 16 is depressed to carry the horn into yielding contact with the work thus allowing for variations in the thickness of the material presented for the insertion of fastenings. It will be understood that the spring 26 is of a strength sufficient to insure proper clinching of the fastenings through the co-operation of the clinching block 10 and the fastening driver at the lower end of the driver bar 28.

Fixedly secured to the horn 8 is a bracket 30 (Fig. 2) having integrally formed therewith or fixedly secured thereto a plate 32 having a smooth supporting surface 34 over which the work support 6 is freely movable. As shown, the work support comprises a base plate 35 and a post 36 designed to support the rear end portions of the tuck *t* and counter *c*. Preferably and as shown, the actual work supporting surface is provided by a plate 38 having flanges, one of which is shown at 40, receivable in guide slots 42 in the upper end of the post 36 so that the plate 38 is slidably mounted on the post. Positioned in a socket 44 in the upper end of the post 36 is a spring 46 having its outer end connected to a pin 48 rigid with the plate 38, the arrangement being such that the plate 38 is held yieldingly in the position shown in Fig. 3 of the drawings, a pin 50 being provided to move in a slot in the upper end of the post 36 and to contact with an end wall of the slot to limit the movement of the plate 38 under the pressure of the spring 46. Carried at the rear end of the plate 38 in fixed relation thereto are two lugs 52 which extend upwardly from the upper surface of the plate 38 a distance corresponding substantially to the thickness of the tucks ordinarily provided for work of this kind. These lugs 52 serve to engage the rear edge of the tuck and, in co-operation with the gage 54, to position the tuck and to center it with respect to the supporting plate 38. For this reason the two lugs 52 are located at a considerable distance each side of the median line of the supporting plate 38 along which the tuck is disposed. Furthermore, these lugs serve to space the counter the proper distance from the rear edge of the tuck, an important feature as will hereinafter be more clearly explained.

At the other end of the base plate 35 is a post 56 which may be integrally formed with the base plate or a separate member fixedly attached thereto. Rotatably supported on the post 56 is a pair of gage members 58 and 60 adapted to enter the forward end of the counter to position the counter in a transverse direction with respect to the forward end of the tuck. In the illustrated construction, the member 60 has a forked extension 62 which is located on the other side of the supporting post 56. Similarly the member 58 has a forked extension 64 located below the first mentioned forked extension, the slots 66 and 68, respectively in each forked extension, extending at a considerable angle to each other and with respect to the longitudinal axis of its respective gage member for a purpose that will be made clear as the description proceeds. Located below the gage members on the post 56 is a slide 70 which straddles the post and is adjustable thereon, the adjustment being secured through the rotation of the adjusting member 72 which is screw-threaded into the post 56. Carried fixedly by the adjusting member 72 is a collar 74 which is located within a slotted extension 76 of the slide 70. Extending upwardly from the upper surface of the slide 70 is a pin or stud 78 which carries an anti-friction roll 80. As shown, the stud 78 with its roller extends into both of the slots 66 and 68, respectively, of the extensions 62 and 64 on the gage members 60 and 58. Upon turning the knurled handle 82 of the adjusting member 72, in a counter-clockwise direction in Fig. 2, the stud 78 is moved away from the post 56 and toward the outer end of both of the slots 66 and 68, thereby moving the gage members 58 and 60 simultaneously away from each other. Since the gage members 58 and 60 are moved to an equal extent in opposite directions they will co-operate in maintaining the counter in proper position with respect to the tuck irrespective of the amount of adjustment to accommodate all of the various sizes of counters which may be presented for fastening inserting operations. Secured to the upper end of the post 56 is a block 84 having in its upper surface a slot or groove in which is slidably mounted the gage member 54 mentioned in the early part of this description. Preferably the gage 54 is provided with an elongated slot so that it may be adjusted in a direction toward and from the clinching block 10 at the upper end of the horn 8, adjustment being made by first loosening the bolt 88 and then tightening it again when the gage has been adjusted. As shown, the front end of the gage 54 presents a vertical surface in one plane against which the front end of the tuck is adapted to be placed in positioning the tuck beneath the fastening inserting mechanism. It will be clear from an inspection of the figures of the drawings that the tuck and counter are supported by the clinching block 10 as well as by the post 36 and that the second post 56 is utilized, in the illustrative

construction, solely for the purpose of providing gage members for both the tuck and the counter.

In order that the work support may accommodate tucks and counters of various sizes, the post 36 is made adjustable upon the base plate 35. As illustrated the base plate is provided with a slot 94 preferably dove-tailed to receive the lower end of the post and to assist in retaining the post in its position on the base plate, it being understood that the post is slidable along the slot to various positions of adjustment. For securing the post in adjusted position there is provided a bolt 96 (Fig. 2) having a head 98 receivable in a T-shaped slot 100 in the lower face of the post 36. As shown the shank of the bolt 96 is screw-threaded exteriorly to fit into a screw-threaded socket in the bolt or adjusting member 102 which is provided with a collar 104 adapted to engage the under surface of the base plate 35. It will be obvious that when the bolt 102 is rotated in the proper direction it will draw the bolt 96 downwardly, thus firmly clamping the post 36 upon the base plate 35 through the co-operation of the head 98 on the bolt 96 with the collar 104 on the adjusting member 102.

In order that the work support 6 may freely move with respect to the horn 8, the base plate 35 is provided with a relatively large opening 106 in its middle portion surrounding the post 8. By reason of this construction, the plate 35 may move in slidable engagement with the surface 34 a considerable distance from right to left in Fig. 2 and also in a direction transversely of the longitudinal axis of the base plate. For the purpose of determining the extent of movement along the longitudinal axis of the base plate there is provided a controlling or limiting member 110 secured to the lower surface of the supporting plate 32. As shown, the member 110 is provided with slots 112 (Fig. 3) for the reception of screws 114 (Fig. 2) by which the plate may be secured adjustably in fixed position. Preferably the plate 110 comprises two arms 116 and 118 spaced from each other and extending practically across an opening 120 in the plate 32. When the work support 6 is moved from right to left or in reversed direction in Fig. 2, the bolt 102 will eventually come into contact with one of the arms 116, 118 and thus the bolt 102 in co-operation with the arms 116, 118 on the plate 110 serves as a limiting means for controlling the extent of movement of the work support in the directions referred to. The bolt 102 also serves to limit the movement of the work support in a direction at right angles to that described by reason of its engagement with the walls of the opening 120 in the plate 32.

In the operations of securing a counter to a tuck with the aid of the work support shown in the illustrated machine, a tuck is first placed in position with its front end in engagement with the gage 54 and resting upon the clinching plate 10, the rear end of the tuck being supported upon the plate 38. The operator is expected to exercise reasonable care in positioning the tuck so that it will extend substantially along each side of a longitudinal line passing through the center of the plate 38 and through the center of the clinching plate 10. He will be assisted in this operation by reason of the presence of the two lugs 52 which are located near but not in contact with the rear curved edge of the tuck. In other words, the post 36 with the supporting plate 38 are so adjusted when a tuck of a given size is to be operated upon, that the lugs 52 will be spaced from the gage 54 a distance slightly greater than the length of the tuck. Hence when the counter c is placed over the tuck t with its inturned flanges c' resting on the tuck and the whole moved to the left in Fig. 2, the lugs 52 engage with the convexly rounded end of the tuck and help to center it properly on its support. Furthermore, the lugs 52 will serve to space the counter, and especially its inner curved surface, away from the adjacent edge of the tuck. Because of the fact that the inner surface of the counter c just below the flanges c' is curved abruptly away from the flange or flanges c' there is a tendency to fit the tuck too closely to the curved wall of the counter causing it to ride up on the curved surface and hence the lugs 52 serve a useful purpose in spacing the counter properly with respect to the tuck.

After the counter and tuck have been placed upon the work support and shoved over toward the left in Fig. 2, during which operation the plate 38 is moved against its spring 46 to enable the lugs 52 to contact with the rear convex edge of the tuck, the whole support 6 is positioned (Fig. 2) for the first fastening to be inserted. Subsequently the support is shoved to the left in Figs. 2 and 3 a distance corresponding to the space between the arms 116 and 118 on the limiting plate 110 and into position for the insertion of the second fastening on the same side or flange portion of the counter. Subsequently the work support is shifted in a direction transverse to the longitudinal axis of the base plate 35 so as to insert the first staple in the opposite flange then the work support is shifted toward the right bringing the bolt 102 up against the arm 118 in which position the fourth and last staple is inserted. Preferably the work support is then shifted transversely of the slot or opening 120 to bring it to initial position, the work is removed and fresh work substituted and then the operations above described repeated to secure another tuck and counter in their de-

sired relation. It will be understood, however, that the order of insertion of the staple fastenings may be varied and that the operator may make the transverse and longitudinal shifts of the work support in such sequence as seems best to him.

Having described my invention what is claimed as new and desired to be secured by Letters Patent of the United States is:—

1. In a support for a counter and a tuck to be secured thereto, means for supporting and locating a tuck in combination with means for positioning the counter in proper relation to the tuck.

2. In a support for a counter and a tuck to be secured thereto, two members relatively movable with respect to each other and operable to support and position a tuck, and means on one of the members for positioning the counter properly with respect to the tuck.

3. In a support for a counter and a tuck to be secured thereto, means for supporting a tuck, and means adapted to enter a counter at both the front and rear portions thereof to position the counter properly with respect to the tuck.

4. In a support for a counter and a tuck to be secured together, means for supporting a tuck and a counter, and means for spacing the rear end of the tuck from the adjacent convexly curved surface of the counter.

5. In a support for a counter and a tuck to be secured together, relatively movable members for supporting a tuck and counter, and gaging means for locating the tuck with respect to both its longitudinal and transverse axes.

6. In a machine for securing a tuck to a counter, fastening inserting mechanism comprising a clinching anvil, a member cooperating with the anvil to support a tuck, said member being movable toward the anvil and operative to position the tuck along both its transverse and longitudinal axes, and means for spacing the counter from the rear edge of the tuck.

7. In a support for a counter and a tuck to be secured thereto, relatively movable members for supporting and positioning a tuck, one of said members having means to space the rear end of the tuck from adjacent surfaces on the counter, and members for entering the forward end of the counter to position the latter properly in a transverse direction with respect to the forward end of the tuck.

8. In a machine for securing a tuck to a counter, fastening inserting mechanism comprising a clinching anvil, a member cooperating with the anvil to support a tuck, said member being movable toward the anvil and operative to position the tuck along both its transverse and longitudinal axes, means for spacing the counter from the rear edge of the tuck, and means for entering the front end of the counter to position the latter transversely with respect to the front end of the tuck.

9. In a machine for securing a tuck to a counter, fastening inserting mechanism comprising a clinching anvil, and a member surrounding the anvil and movable horizontally in all directions with respect thereto for positioning a counter and tuck for the reception of a plurality of fastenings driven by said inserting mechanism.

10. In a machine for securing a tuck to a counter, fastening inserting mechanism comprising a clinching anvil, and a support for a counter and a tuck movable universally in a horizontal plane for presenting the counter and tuck for the insertion of fastenings, said support being provided with means comprising two members for entering the forward end of the counter to position the latter in a transverse direction with respect to the tuck.

11. In a machine for securing a tuck to a counter, fastening inserting mechanism including a clinching anvil, a support for a counter and tuck movable universally in a horizontal plane with respect to the anvil to present the work for the insertion of a plurality of fastenings, said support comprising a member for supporting and gaging the rear end of the tuck and another member for entering the forward end of the counter to position the same transversely with respect to the forward end of the tuck, and means for adjusting the last mentioned positioning member so as to accommodate counters of various sizes.

12. In a machine for securing a tuck to a counter, fastening inserting mechanism comprising a clinching anvil, a work support for the counter and tuck comprising a member for supporting and gaging the rear end of the tuck while the anvil supports the forward end thereof, and positioning means for the forward end of the counter comprising two members movable equally in opposite directions for adjustment to various sizes of counters.

13. In a machine for securing a tuck to a counter, fastening inserting mechanism comprising a clinching anvil, a support for a counter and tuck movable universally in a horizontal plane to position the counter and tuck for the insertion of a plurality of fastenings, and means for controlling the movement of the support so as to determine the spacing of the fastenings.

14. In a machine for securing a tuck to a counter, fastening inserting mechanism comprising a clinching anvil, a support for the tuck and counter movable relatively to the inserting mechanism to provide for the insertion of a plurality of fastenings at different portions of the tuck, and means mov-

able with the support to position the forward end of the counter with respect to the tuck.

15. In a machine for securing a tuck to a counter, fastening inserting mechanism comprising a clinching anvil, a support for the tuck and counter movable relatively to the inserting mechanism to provide for the insertion of a plurality of fastenings at different portions of the tuck, and members for positioning the forward end of the counter with respect to the tuck, said members being simultaneously adjustable to an equal degree and in opposite directions to engage the inner surface of the counter whereby counters of different sizes may be properly positioned with respect to the forward end of the tuck.

16. In a support for a counter and a tuck to be secured together, a base plate, a member carried on the plate and adapted to support a tuck, a second member on the base plate carrying a gage for the forward end of the tuck and also members to engage within the forward end of the counter to position the latter with relation to the forward end of the tuck.

17. In a support for a counter and a tuck to be secured together, a base plate, a member carried on the plate and adapted to support a tuck, a second member on the base plate carrying a gage for the forward end of the tuck and also members to engage within the forward end of the counter to position the latter with relation to the forward end of the tuck in a transverse direction, and means for simultaneously adjusting the positioning members equally in opposite directions to engage the inner surfaces of the forward end of the counter whereby counters of various sizes may be accurately positioned with respect to the tuck.

18. In a machine of the class described, fastening inserting mechanism for securing a tuck to the counter comprising an anvil for clinching the fastenings, a support for the counter and tuck movable freely with respect to the anvil so as to position the assembled counter and tuck for the insertion of a plurality of fastenings spaced along each side of the tuck, and a member fixedly secured relatively to the anvil and arranged to limit the movement of said support relatively to the anvil.

19. In a machine for securing a tuck to a counter, fastening inserting mechanism including a clinching anvil, and a work support for the counter and tuck comprising a member for supporting the rear end of the tuck while the anvil supports the forward end thereof, said member having means for spacing the rear end of the tuck from the adjacent curved surface of the counter.

20. In a machine for securing a tuck to a counter, fastening inserting mechanism comprising a clinching anvil, a support for a counter and tuck movable universally in a horizontal plane to position the counter and tuck for the insertion of a plurality of fastenings, and adjustable means for controlling the movement of the support so as to determine the spacing of the fastenings.

21. In a machine for securing a tuck to a counter, fastening inserting mechanism comprising a clinching anvil, a support for the tuck and counter movable relatively to the inserting mechanism to provide for the insertion of a plurality of fastenings at different portions of the tuck, and means movable with the support to position the rear end of the counter with respect to the tuck.

22. In a machine for securing a tuck to a counter, fastening inserting mechanism including a clinching anvil, and a support for a counter and a tuck movable universally in a horizontal plane for presenting the counter and tuck for the insertion of fastenings in rows along each side of the tuck.

23. In a machine for securing a tuck to a counter, fastening inserting mechanism including a clinching anvil, and a support for a counter and tuck movable universally in a horizontal plane with respect to the anvil to present the work for the insertion of a plurality of fastenings, said support comprising a member for supporting and gaging the rear end of the tuck and another member for entering the forward end of the counter to position the same transversely with respect to the forward end of the tuck.

24. In a machine for securing a tuck to a counter, fastening inserting mechanism including a clinching anvil, a support for the tuck and counter movable relatively to the inserting mechanism to provide for the insertion of a plurality of fastenings at different portions of the tuck, and members on the support for positioning the forward end of the counter with respect to the tuck in a transverse direction and for spacing the tuck at the convex end thereof from the adjacent curved surface of the counter.

25. In a support for a counter and a tuck to be secured together, a base plate, a member carried on the plate and adapted to support a tuck and having lugs to space the rear end of the tuck from the adjacent curved surface of the counter, and a second member on the base plate carrying a gage for the forward end of the tuck.

26. In a machine for securing shoe parts together, fastening inserting mechanism including a clinching anvil, a member co-operating with the anvil to support a shoe bottom part, said member being movable relatively to the anvil and operative to position the shoe bottom part along both its transverse and longitudinal axes, means for spac-

ing another shoe part from the rear edge of the shoe bottom part, and means for entering the front end of the second shoe part to position the latter transversely with respect to the front end of the shoe bottom part.

27. In a machine for securing shoe parts together, fastening inserting mechanism including a clinching anvil, and a member movable horizontally in all directions with respect thereto for positioning the shoe parts for the reception of a plurality of spaced fastenings driven by said inserting mechanism.

28. In a support for two pieces of work to be operated upon, a base plate, a member on the plate adapted to support a piece of the work, a second member on the base plate carrying a gage for the forward end of the piece of work and also members to engage a second piece of work to position the latter with relation to the first piece of work, and means for simultaneously adjusting the positioning members equally in opposite directions to engage surfaces of the second piece of work, whereby pieces of work of various sizes may be accurately positioned with respect to each other.

29. In a machine of the class described, fastening inserting mechanism for attaching shoe parts comprising an anvil for clinching the fastenings, a support for the shoe parts movable in a given plane universally with respect to the anvil so as to position the shoe parts for the insertion of a plurality of spaced fastenings, and means for controlling the movement of the work support relatively to the anvil.

30. In a machine of the class described, fastening inserting mechanism comprising a horn provided with a clinching surface, a work support carried by the horn for movement in all directions in a horizontal plane to present the work in a plurality of fastening inserting positions, and means for controlling the movement of the work support relatively to the horn.

In testimony whereof I have signed my name to this specification.

FRED L. MACKENZIE.