Nov. 18, 1941. B. JORGENSEN 2,262,805

FASTENING INSERTING MACHINE

Filed Dec. 27, 1940 2 Sheets-Sheet 1

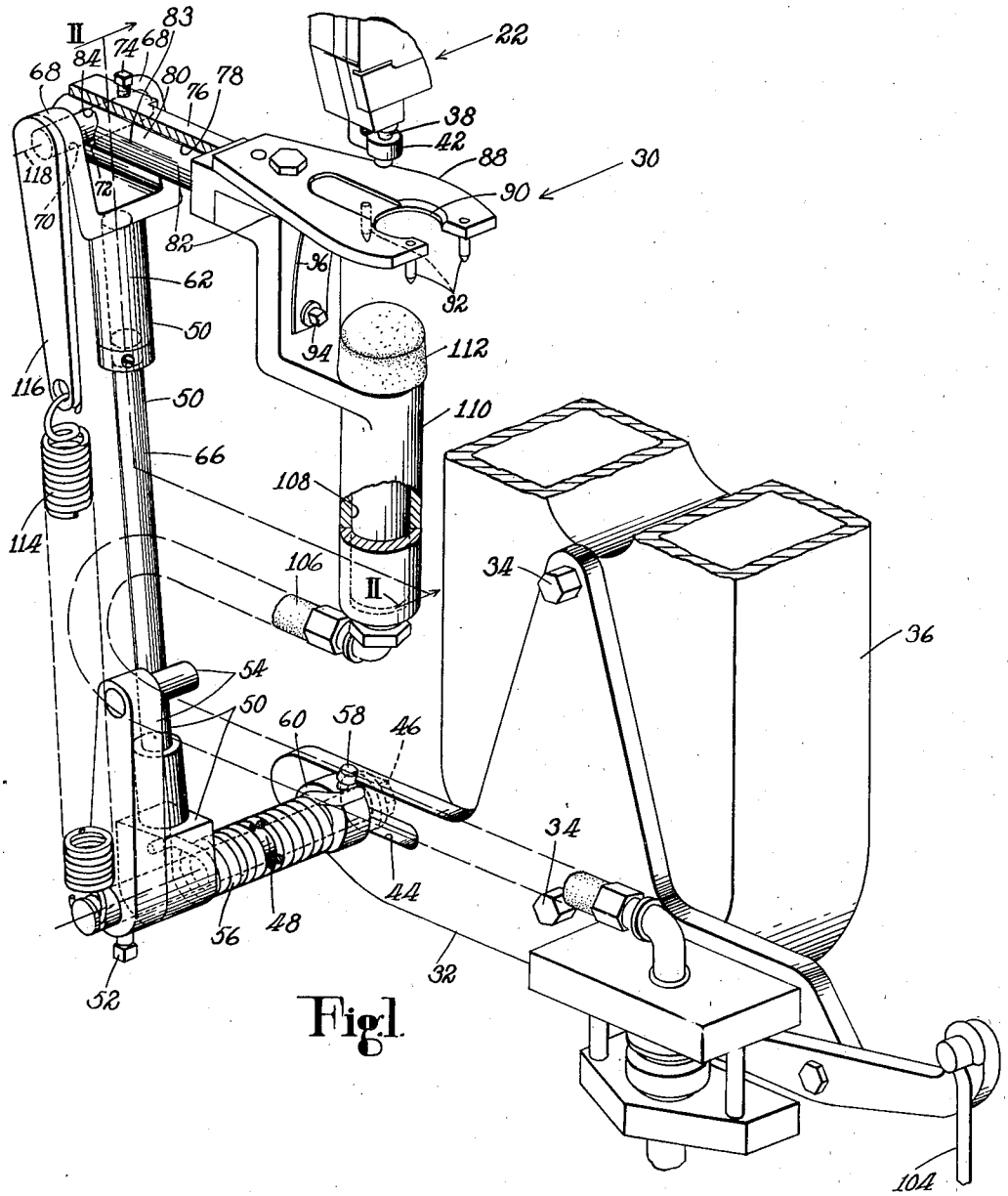


Fig. 1.

INVENTOR
Bernhardt Jorgensen
By his Attorney
Victor Cobb

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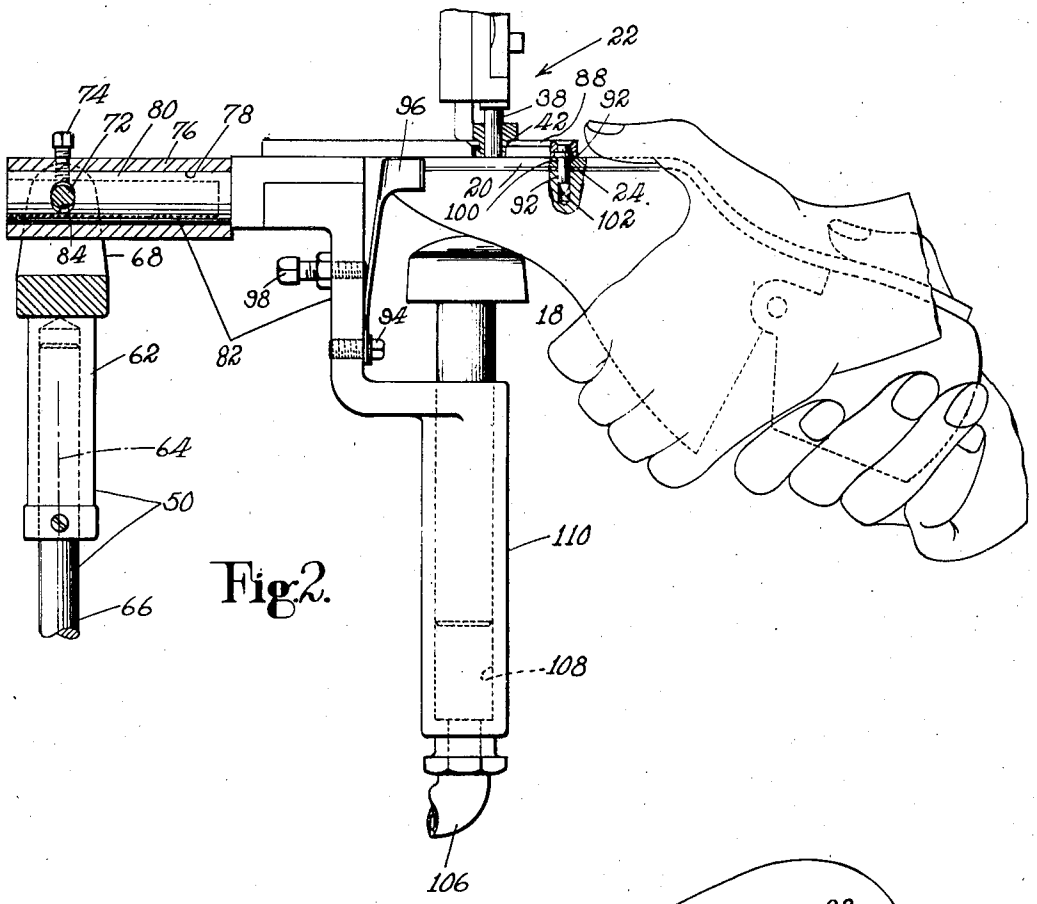
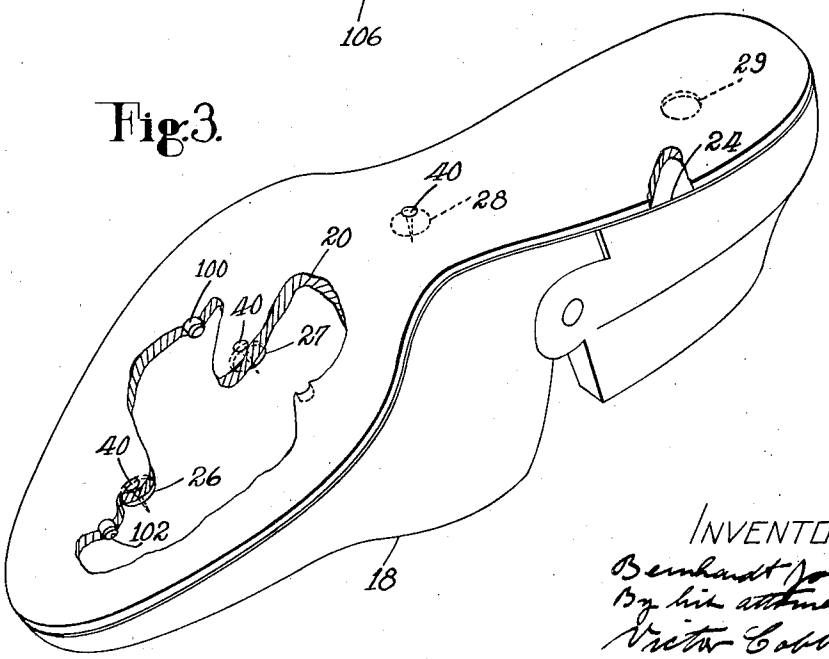


Fig. 2.

Fig. 3.



INVENTOR.
Bernhardt Jorgensen
By his attorney
Victor Cobb

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2,262,805

FASTENING INSERTING MACHINE

Bernhardt Jorgensen, Marblehead, Mass., assignor to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

Application December 27, 1940, Serial No. 371,937

17 Claims. (Cl. 12—19.2)

This invention relates to machines for use in the manufacture of shoes and is illustrated as embodied in an improved fastening inserting machine for securing insoles to the bottoms of lasts.

As disclosed in United States Letters Patent No. 1,736,276, granted November 19, 1929, on an application filed in the name of Arthur F. Pym, it has been proposed to position insoles upon the bottoms of lasts by the use of clamping members, each having two projecting pins which fit in pairs of registering holes, respectively, formed in the insole and the last bottom. After the insole has been positioned and clamped to the bottom of the last, as above described, the assembled unit is presented by hand to fastening inserting mechanism to cause tacks or other suitable fastenings to be driven through the insole and into the bottom of the last preparatory to performing various other shoemaking operations, the registering recesses in the insole and bottom of the last later being utilized to position the insole and the last in a lasting machine, as disclosed, for example, in United States Letters Patent No. 1,674,060, granted June 19, 1928, on an application filed in the name of Arthur F. Pym.

Various devices, such, for example, as disclosed in United States Letters Patent No. 1,702,364, granted February 19, 1929, on an application filed in the name of Arthur F. Pym, and in United States Letters Patent No. 2,186,046, granted January 9, 1940, on an application filed in the name of A. R. Schoenky, have been incorporated in fastening inserting machines and are adapted to position insoles upon the bottoms of lasts and to facilitate the presentation of said positioned insoles to mechanism for driving fastenings through the insoles and into the lasts. It has been found that although insoles can be secured more accurately to the bottoms of lasts by the use of clamping members or devices such as above referred to than by the well-known hand positioning and tacking method, such members or devices have not enjoyed substantial commercial success because of the fact that their use increases little, if any, the speed of the above-mentioned operation.

It is an object of the present invention to provide a fastening inserting machine by the use of which insoles may be positioned upon and secured to the bottoms of lasts faster and more accurately than has heretofore been possible.

With the above object in view, and in accordance with a feature of the present invention, there is provided a fastening inserting machine comprising means for positioning an insole upon the bottom of a last, means for clamping together the last and the insole positioned thereon, mechanism for inserting fastenings, said clamping means being mounted for movement to transfer the insole to a predetermined position adjacent to the fastening inserting mechanism, and means for operating said mechanism to drive a fastening through the insole and into the last.

The foreparts of insoles and the bottoms of the lasts are each provided with three cylindrical holes which are of equal diameter and are arranged in triangular relation, the arrangement being such that when corresponding holes formed in the last and the insole which is to be attached to the last are in registration, the insole is positioned accurately upon the last. In order to position the insole upon the bottom of the last, the illustrative machine is provided with a work carrier an abutment of which has three pins shaped and arranged to register in corresponding holes respectively, in the insole and the bottom of the last, a gage being secured to the carrier to assist the operator in alining the corresponding holes in the insole and the last with the pins of the carrier, thereby facilitating the proper assembling of the insole and the last upon the pins.

In order that the last and the insole positioned thereon as above described shall be clamped securely together and shall be held against movement in the work carrier preparatory to and during the attachment of the insole to the last, the carrier is provided with a fluid-operated presser member which forces the forepart of the last against the forepart of the insole and the insole against said abutment. The carrier is normally held yieldingly in an idle or loading position away from the fastening inserting mechanism by suitable spring-operated mechanism, the construction and arrangement of the carrier and its supporting mechanism being such that the operator, by gripping the work, may quickly and effectively present different portions of the insole positioned upon and clamped against the last successively to the fastening inserting mechanism preparatory to driving tacks or other fastenings through the insole and into the last. By the use of the above machine insoles may be secured to the bottoms of lasts quicker and more effectively than has heretofore been possible.

Various other features of the invention will be understood and appreciated from the following

detailed description read in connection with the accompanying drawings, in which

Fig. 1 is a perspective view, partly broken away and partly in section, showing a portion of the fastening inserting head of the illustrative machine, and a support for assembling an insole and a last and presenting the same to said head;

Fig. 2 is a side elevation viewed along line II—II of Fig. 1, showing the machine in the process of driving the foremost tack through an insole and into the bottom of a last upon which the insole is positioned and clamped; and

Fig. 3 is a perspective view, partly broken away, of the last and the insole shown in Fig. 2 after the insole has been tacked to the last by the use of the above machine.

The illustrative machine is described with reference to positioning upon and clamping against the bottom of a last 18 (Figs. 2 and 3) an insole 20, and thereafter tacking the insole to the last by the use of well-known fastening inserting mechanism 22 (Figs. 1 and 2), such, for example, is disclosed in United States Letters Patents Nos. 1,106,393 and 1,312,557, granted August 11, 1914 and August 12, 1919, respectively, on applications filed in the name of Fred L. MacKenzie.

The last 18, which is of the type commonly used in the manufacture of McKay shoes, for example, has secured to its bottom a steel plate 24 (Fig. 3) provided with holes 26, 27, 28 and 29, respectively, arranged along the median portion of the bottom of the last. The hole 26 is spaced the same distance from the toe or toe end of the last regardless of the size or shape of the last, and the holes 27 and 28, respectively, are located at the ball portion and at the break line of the last.

In order quickly and accurately to position the insole 20 upon and to clamp it securely against the last 18 preparatory to tacking the insole to the last, there is provided a work assembling and supporting unit 30 (Fig. 1) which is mounted upon a bracket 32 secured by one or more screws 34 to a standard 36 of the machine. The fastening inserting mechanism 22 comprises a nozzle 38 (Figs. 1 and 2) through which tacks 40 are driven by suitable mechanism (not shown) actuated upon depression of a treadle (not shown) or by pressure of the insole 20 clamped in the unit 30, as will appear later, against a trip lever 42 operatively connected to a one-revolution clutch (not shown).

Passing through an elongated slot 44 (Fig. 1) in the bracket 32 and secured to the bracket, through the provision of a nut 46, is a bearing rod 48 upon which is pivoted a support 50. Secured by a lock screw 52 to a reduced portion of the rod 48 is a stop 54 against which the support 50 is held, when the machine is idle, by a coil spring 56 one end of which embraces the support and the other end of which embraces a stud 58 on a collar 60 secured to the rod.

An upper portion 62 of the support 50, which is mounted for pivotal movement about an axis 64 (Fig. 2) with relation to a lower portion 66 of the support, has at its upper end bifurcations 68 in alined openings 70 (Fig. 1) of which a pin 72 is rotatably mounted. Fitting between the bifurcations 68 and secured to the pin 72 by a pair of lock screws 74 is a supporting sleeve 76 in a bore 78 of which fits a shank portion 80 of a work carrier 82. The shank portion 80 has an opening 84 through which extends the pin 72, the arrangement being such that the work carrier 82 may be rotated slightly in the bore 78 of the supporting sleeve 76 about an axis 83 of the shank portion, within limits determined by the opening 84. The carrier 82 comprises a plate or abutment 88 provided with a U-shaped opening 90 (Fig. 1) and having secured to it three depending pins 92, and secured to the carrier by a screw 94 is a bifurcated gage 96 which is initially positioned upon the carrier through the provision of an adjusting screw 98 (Fig. 2).

In the use of the machine, the operator usually grasps the insole 20 to be operated upon with his left hand and, after forcing the toe end of the insole against the gage 96 and the bottom (the top in Figs. 2 and 3) face of the insole against pointed ends of the pins, swings the insole widthwise about its toe end until three holes 100 (Fig. 3) formed in the insole are brought into registration with the corresponding pins 92, the insole then being forced onto the pins. Simultaneously therewith the operator grasps the last 18 with his right hand and, by following the same general procedure above outlined in connection with the insole, causes the holes 102 formed in the bottom of the last to register with the pins 92. A treadle rod 104 is then depressed to actuate a valve (not shown) which admits a suitable fluid, such, for example, as air or oil, to a hose 106 connected to a cylindrical chamber 108 of a housing 110 forming part of the carrier, thereby raising a presser member or clamp 112 in the chamber and thus forcing the forepart of the last 18 against the forepart of the insole 20 and the insole against the bottom of the plate 88, the insole and the last thus being secured against movement in the carrier. As above stated, the holes 100, 102 in the insole 20 and the last 18, respectively, are so constructed and arranged that when corresponding holes in the insole and the last are in registration, as they are when mounted upon the pins 92, as illustrated in Fig. 2, the insole is accurately positioned upon the last.

When the machine is idle, as illustrated in Fig. 1, the carrier 82 is held yieldingly in a horizontal position in which the plate 88 is arranged well below the tack nozzle 38, through the provision of a spring 114 the upper end of which engages an arm 116 welded to the pin 72. The machine may thus be described as comprising yieldable means for maintaining the carrier 82 upon the support 50 in a predetermined idle position away from the fastening inserting mechanism 22.

After the work has been positioned and clamped in the machine, the operator grasps the last 18, in the manner illustrated in Fig. 2, and swings the carrier, together with the work clamped therein, upwardly about the axis 118 of the pin 72 (the support 50 at this time remaining stationary) until the insole 20 engages the trip lever 42 and then the nozzle 38, thereby actuating tack driving mechanism (not shown) to cause the first tack 40 (that is, the forwardmost tack shown in Fig. 3) to be driven through the insole and then through the opening 26 in the steel plate 24 and into the last 18. The opening 26 in the steel plate and the various holes 100, 102 in the insole 20 and the last 18, respectively, are arranged in constant positions with relation to the toe end of the insole and the last irrespective of the size of the insole and the last, the gage 96 being so positioned that the insole and the last may be quickly assembled upon the carrier, as above described, with the opening 26 arranged opposite the central portion of the U-shaped opening 90 formed in the plate 88. It will be noted that in presenting the insole 20 to the nozzle 38 to drive the first tack 40, the support 50 is not moved

about the pin 48 since said support is so positioned by the stop 54 that when the carrier 82 is swung upwardly about the axis 118 of the pin 72, the nozzle enters the U-shaped opening 90 and is arranged opposite the opening 26 in the steel plate 24 so that the tack can be driven through the insole and into the last 18.

Preparatory to driving the second and third tacks 40 through the insole 20 and through the holes 27, 28, respectively, and into the last, the operator swings the carrier 82 about the axis 118 of the pin 72 and the support 50 about pin 48, the portion of the insole through which the tacks are to be driven being estimated by eye. It has been found that the operator soon becomes proficient in driving the second and third tacks and, if desirable, a fourth tack, through the holes 27, 28 and 29, respectively, in the plate 24 without mechanically guiding the carrier as in locating the position at which the first tack is driven. It will be noted that the holes 26 to 29, inclusive, formed in the last plate 24 are not exactly in alinement and that the operator, in carrying out the above operations, usually turns the upper portion 62 of the support, together with the carrier 82, slightly about the axis 64 (Fig. 2) with respect to the lower portion 66 of the support. Moreover, since the shank portion of the insole 20 in engagement with the bottom of the last is usually slightly convexed widthwise and it is desirable to drive the tack normal to the insole, the carrier 82, preparatory to driving the third tack into the insole, is sometimes tilted widthwise to a slight degree about the axis 83 of the shank portion 80 of the carrier.

The carrier 82, which is pivoted to the upper portion 62 of the support 50 about the axis 118 extending transversely of the last 18 and arranged in front of said last and approximately in the general plane of the forepart of the insole 20, may be described as mounted for swinging movement lengthwise, heightwise and widthwise of the last to move different portions of the insole successively to a position adjacent to the nozzle 38. It will be noted that the axis 64 (Fig. 2) is arranged at approximately right angles to the axes of the rod 48 and the pin 72, respectively, which are horizontally arranged and are parallel to each other, and that the axis 83 of the shank portion 80 of the carrier 82 is arranged at approximately right angles to a plane defined by the axes of said rod and pin.

After the tacks 40 have been driven through the insole 20 and into the bottom of the last 18, the treadle rod 104 is lowered, thereby causing the presser member 112 to be lowered in the cylinder 108. The last 18 and the insole 20 tacked thereto are then removed from the machine and the carrier 82 is moved back to its idle or starting position, the spring 56 causing the lower portion 66 of the support 50 to be moved against the stop 54 and the spring 114 causing the carrier 82 to be moved to its horizontal position and also causing it to swing about the axes 64 and 83 to the neutral position shown in Fig. 1.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A fastening inserting machine having, in combination, means for positioning an insole upon the bottom of a last, means for clamping together the last and the insole positioned thereon, mechanism for inserting fastenings, said clamping means being mounted for movement to transfer said insole to a predetermined position adjacent to said mechanism, and means for operating said mechanism to drive a fastening through the insole and into the last.

2. In a machine for inserting fastenings, a carrier constructed and arranged to position an insole upon the bottom of a last and to clamp the positioned insole securely against the last, means for inserting fastenings, said carrier being so mounted for movement that different portions of the insole clamped in the carrier may be successively moved to a predetermined position adjacent to said means preparatory to driving fastenings through the insole and into the bottom of the last, and means for actuating the fastening inserting means.

3. A fastening inserting machine having, in combination, means for positioning an insole upon the bottom of a last, means for clamping the positioned insole against said last bottom, mechanism for driving fastenings, said insole positioning and clamping means being mounted for movement to transfer the insole to a position adjacent to said fastening inserting mechanism, and means responsive to movement of the insole for initiating movement of said mechanism to drive a fastening through the insole and into the bottom of the last.

4. A fastening inserting machine having, in combination, a carrier comprising means for positioning an insole upon the bottom of a last and means for clamping together the last and the insole positioned thereon, mechanism for inserting fastenings, said carrier being mounted for pivotal movement and forming together with the clamped last an elongated lever which may be readily swung by the operator to transfer the insole to a predetermined position adjacent to said fastening inserting mechanism, and means for operating said mechanism to drive a fastening through the insole and into the last.

5. A fastening inserting machine having, in combination, an abutment provided with pins constructed and arranged to register in corresponding holes formed in an insole and in the bottom of a last to position the insole upon the last, a presser member constructed and arranged to be forced against the last thereby causing said last to be forced securely against said insole and the insole to be forced securely against the abutment, fastening inserting mechanism comprising a nozzle through which fastenings are driven, said abutment and said presser member being mounted for bodily movement to cause the positioned and clamped insole to be transferred to a position adjacent to the nozzle, and means for actuating said mechanism to drive a fastening through the insole and into the last to secure the insole to the last.

6. A fastening inserting machine having, in combination, a carrier having a plurality of pins shaped and arranged to co-operate with corresponding holes formed in an insole and the bottom of a last to position said insole in a predetermined position upon the bottom of the last, a clamp for securing the last and the positioned insole to the carrier, means for driving fastenings, said carrier being mounted for bodily movement lengthwise and heightwise of the last clamped thereto to transfer different portions of the insole successively to a position adjacent to said fastening driving means, and mechanism for actuating said means to drive fastenings through the insole and into the bottom of the last.

7. A fastening inserting machine having, in

combination, a carrier provided with a plurality of pins constructed and arranged to co-operate with corresponding holes formed in an insole and the bottom of a last to position the insole upon the last bottom, a clamp mounted for movement in the carrier, means for operating the clamp, said clamp being constructed and arranged to force the positioned insole securely against the bottom of the last and to secure the insole and the last against movement in the carrier, means for driving fastenings, said carrier being mounted for movement to present different portions of the insole successively to said fastening driving means, and mechanism for actuating the fastening driving means to drive fastenings through the insole and into the bottom of the last.

8. A fastening inserting machine having, in combination, an abutment provided with two or more pins arranged to co-operate with corresponding holes formed in an insole and the bottom of a last to locate the insole upon the last bottom, fastening inserting means comprising a nozzle through which fastenings are driven, a gage constructed and arranged to be engaged by the toe of the insole and the toe of the last to facilitate positioning the insole and the last with relation to said abutment, a presser member for forcing the last against the insole and the insole against the abutment, said abutment and said presser member being mounted for swinging movement lengthwise and heightwise of the last to force different portions of the insole successively to a position adjacent to the nozzle, and means for actuating said fastening driving means to drive fastenings through the different portions respectively of the insole and into the last.

9. A fastening inserting machine having, in combination, a carrier provided with a plurality of pins shaped and arranged to be received in corresponding holes formed in an insole and the bottom of a last to position the insole upon the last bottom, a presser member mounted for movement in the carrier, fluid pressure means for operating the presser member, said presser member being constructed and arranged to force the insole against the bottom of the last and to secure the insole and last against movement in the carrier, means for driving fastenings, said carrier being mounted for swinging movement lengthwise, heightwise and widthwise of the last secured to the carrier to present successively different portions of the insole to the fastening driving means, and mechanism for operating said fastening driving means to drive fastenings through the insole and into the last.

10. A fastening inserting machine having, in combination, a carrier provided with a plurality of pins constructed and arranged to register in corresponding holes formed in an insole and the bottom of a last to position the insole on said last bottom, a clamp for securing the last and the insole positioned thereon to the carrier, mechanism for driving fastenings, said carrier and clamp being mounted for bodily movement as a unit lengthwise, heightwise and widthwise of the last as well as being mounted for tilting movement laterally of the last to facilitate moving the insole positioned on the last and secured to the carrier to a predetermined position adjacent to said fastening driving mechanism, and means operative in response to pressure of the insole for actuating the fastening driving mechanism to cause a fastening to be forced through the insole and into the bottom of the last.

11. A fastening inserting machine having, in combination, a carrier provided with pins constructed and arranged to be received in corresponding holes formed in an insole and the bottom of a last to position the insole upon the last bottom, a presser member supported by and mounted for movement in the carrier, said presser member being constructed and arranged to clamp the positioned insole and the last securely to the carrier, a movable support to which said carrier is pivoted, a stop for initially locating the support in a predetermined position, spring-operated means for initially locating the carrier in a predetermined position with relation to the support, spring-operated means for initially forcing the support against the stop, and means for driving fastenings, said carrier being mounted for bodily movement together with and also with relation to the support against the action of said spring-operated means to move the insole clamped in the carrier adjacent to the fastening driving means preparatory to operating said means to drive a fastening through the insole and into the bottom of the last.

12. A fastening inserting machine having, in combination, a carrier provided with a plurality of pins constructed and arranged in co-operation with corresponding holes formed in an insole and the bottom of a last to position the insole upon the last bottom, a presser member for securing the last and the insole positioned thereon to the carrier, means for driving a fastening, a support, said carrier being pivoted to the upper end of the support about an axis which extends transversely of said last and is arranged in front of the last and in the general plane of the forepart of said insole, said upper end of the support being mounted for movement lengthwise of the last, yieldable means for maintaining the carrier upon the support in a predetermined idle position away from the fastening driving means, yieldable means for maintaining the support in a predetermined upright idle position, and mechanism for actuating the fastening driving means to drive fastenings through the insole and into the bottom of the last when the insole has been moved to a position adjacent to said fastening driving means.

13. A fastening inserting machine having, in combination, a carrier provided with a plurality of pins constructed and arranged to be received in corresponding holes formed in an insole and the bottom of a last to locate the last upon the carrier and the insole in a predetermined position upon the bottom of said last, mechanism for driving fastenings, a vertical support pivoted at its lower end, a carrier pivoted to the upper end of said support, said carrier being tiltable laterally of the last secured thereto with relation to the support, spring-operated means for maintaining the support and the carrier in approximately vertical and horizontal positions respectively when the machine is idle, and means operative when engaged by the insole positioned and clamped in the carrier to actuate said fastening driving mechanism thereby causing a fastening to be driven through the insole and into the last.

14. In a machine for inserting fastenings, a carrier comprising means for positioning an insole upon the bottom of a last and a fluid-operated presser member for clamping the insole against the last and for securely holding the insole and last in the carrier, means for inserting

fastenings, said carrier being so mounted for movement that different portions of the insole clamped in the carrier may be successively moved to a predetermined position adjacent to said means preparatory to driving fastenings through the insole and into the bottom of the last, and mechanism for actuating the fastening inserting means.

15. In a machine for inserting fastenings, a carrier comprising means constructed and arranged to position an insole on the bottom of a last and to clamp the positioned insole and last together against movement in the carrier, a gage constructed and arranged to be engaged by the toe ends of the insole and the last respectively to facilitate the positioning of the insole and the last in said carrier, mechanism for inserting fastenings, said carrier being so mounted for movement that different portions of the insole clamped in the carrier may be moved successively to a predetermined position adjacent to said mechanism preparatory to driving fastenings through the insole and into the bottom of the last, and means for actuating the fastening inserting mechanism.

16. In a fastening inserting machine, a carrier having a horizontal abutment provided with pins constructed and arranged to register in corresponding holes formed in an insole and the bottom of a last to position the insole upon the last, and a clamp mounted for movement in the carrier to force the last against the insole and the insole against the abutment, said carrier being movable about two spaced horizontal axes and also being movable about a vertical axis.

17. In a fastening inserting machine, a carrier having a horizontal abutment provided with pins constructed and arranged to register in corresponding holes formed in an insole and the bottom of a last to position the insole upon the last, a clamp mounted for movement in the carrier to force the last against the insole and the insole against the abutment, said carrier being movable about two spaced parallel axes and also being tiltable about an axis which intersects the last and is arranged at approximately right angles to a plane defined by said first-named axes.

BERNHARDT JORGENSEN.