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1,995,303

METHOD AND MACHINE FOR USE IN THE MANUFACTURE OF SHOES AND PRODUCT THEREOF

Filed April 21, 1932

Fig.1.

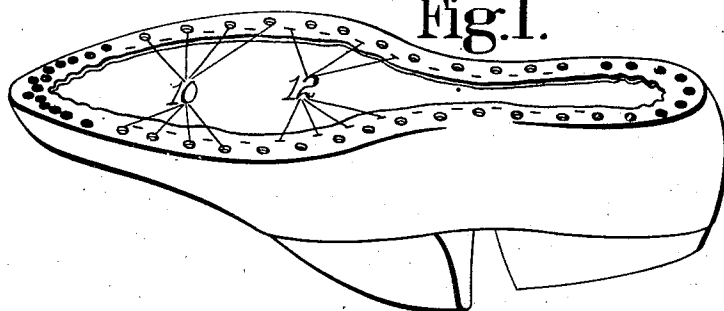


Fig.2.

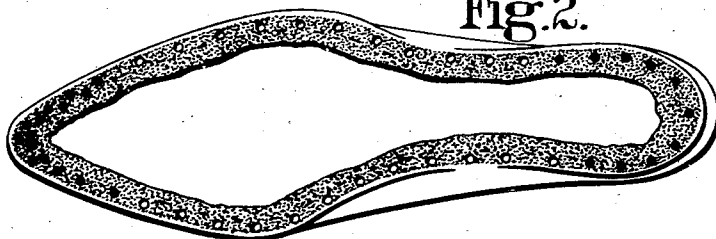


Fig.3.

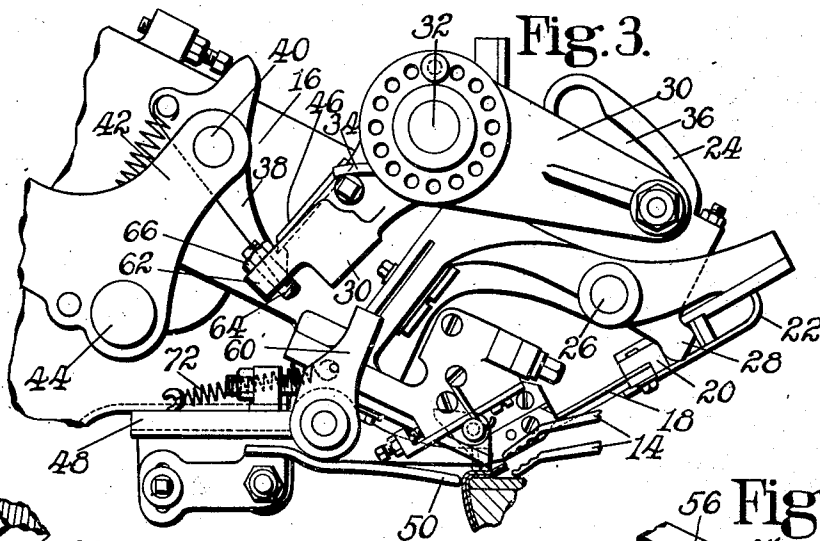


Fig.5.

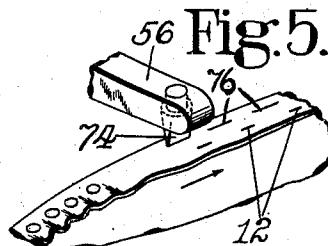
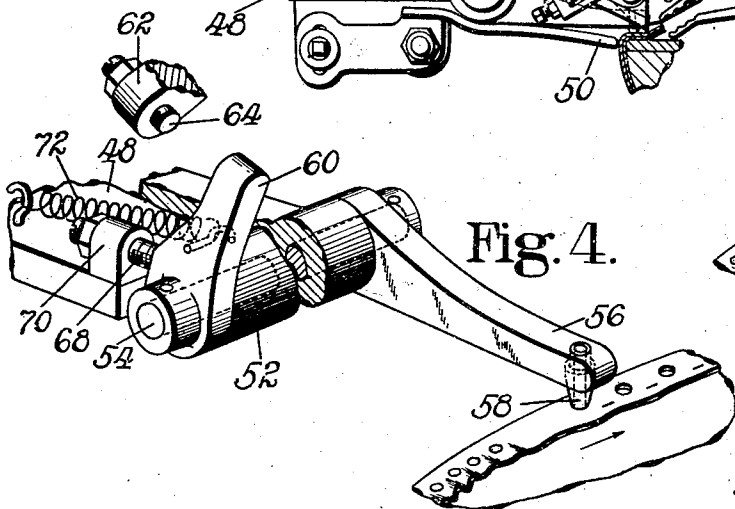


Fig.4.



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UNITED STATES PATENT OFFICE

1,995,303

METHOD AND MACHINE FOR USE IN THE
MANUFACTURE OF SHOES AND PRODUCT
THEREOF

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Application April 21, 1932, Serial No. 606,668
In Great Britain May 20, 1931

32 Claims. (Cl. 12-2)

This invention relates to the art of shoemaking and particularly to methods and machines for treating the overlapped margins of shoe uppers to prepare them for the attachment of outsoles by cement and to the product of such methods and machines.

In the manufacture of shoes having cement-attached outsoles, it is usual to remove the surface portion of the overlapped upper leather by a roughing or scouring operation before the sole attaching cement is applied to the shoe bottom. This operation requires skill and care on the part of the operator since it is desirable, in order to obtain a secure attachment of the outsole, that the overlapped surface of the upper be roughened substantially to the edge of the shoe bottom while it must not be carried out far enough to be visible in the finished shoe. Additional difficulties are encountered, moreover, in performing the roughing operation on various types of leather due to the thinness and weakness of the leather in some cases and to the hardness of the leather in others. For example, it is practically impossible to perform an effective roughing operation on some lizard and other reptile skins.

It is an object of the present invention to obviate the difficulties encountered in the performance of this roughing operation, and this, as disclosed herein, is accomplished either by providing properly located indicating marks on the overlapped margin of the upper to guide the operator in the roughing operation, so that less skill and care will be required in performing that operation, or by eliminating the roughing operation altogether.

For example, and as herein disclosed, the area to be roughed may be indicated with marks which are indelible in the sense that they will not be obliterated by the operation of the roughing machine and will remain permanently as an indication of the extent of the area which should be roughed. These marks may take the form of perforations extending through the upper and lining materials or they may be mere indentations or incisions which do not extend through the upper leather. In one aspect of the invention, and as illustrated herein, the perforations or other marks in the overlapped portion of the shoe upper may be made progressively in conjunction with a progressive lasting operation and may be gaged by the same gaging means which is utilized to control the position of the fastenings inserted by the lasting machine. These perforations, moreover, may be utilized in some

instances to the exclusion of a subsequent roughing operation. Under these circumstances the sole attaching cement fills the perforations and is forced from them between the layers of the upper and between the upper and the insole, thus thoroughly bonding the outsole to the shoe bottom.

In the practice of our invention, as herein illustrated, an insole, which may have a coat of dry cement on its margin, is applied to a last and an upper is assembled on the last and pulled over. Next, successive portions of the upper, at the sides at least of the shoe, are tensioned and worked over the insole, for example, by means of a gripper, each portion being secured in lasted position by suitable securing means, for example staples. In conjunction with this progressive lasting operation, indicating marks are made upon the upper in predetermined relation to the edge of the shoe bottom so as to indicate to the roughing machine operator how far the roughing should extend outwardly of the shoe bottom. These marks may, as illustrated, be made by a punch operating in conjunction with the operation of inserting metallic fastenings such, for example, as staples, to hold the upper in lasted relation to the insole. As illustrated, the punch may be hollow and may be driven through the upper and lining so that at each operation a small portion of the upper material is removed, thus exposing the cemented surface of the insole so that cement applied to the overlapped margin of the upper may pass through the openings in the upper and reach the insole or the cement thereon. Also, as illustrated, the indicating marks may be made by an incising or indenting tool operating a predetermined distance from the edge of the shoe bottom to form depressions in the upper which indicate the outer limit to which the roughing operation should be carried.

The illustrated machine comprises a gripper for seizing and tensioning heightwise of the last and over the last successive portions of the upper, a stapling nozzle including a staple driving mechanism movable over a shoe bottom to work the tensioned portion of the upper into lasted position, a gage for the edge of the shoe bottom by which a staple driven through the nozzle is located a predetermined distance from the edge of the shoe bottom, and a marking device which may, as illustrated, be in the form of a tubular punch which is operated to perforate each overlapped portion of the upper at a predetermined distance from the edge of the shoe bottom as de-

terminated by the gage. As illustrated, the punch is operated by the staple driving mechanism. Also, as illustrated, the marking device may take the form of an incising or indenting tool which does not necessarily perforate the upper but makes marks thereon which will not be obliterated by a subsequent roughing operation while serving like the perforations to indicate the extent to which the roughing operation should be carried outwardly of the shoe bottom.

These and other aspects of the invention will be better understood from the following detailed description when read in connection with the accompanying drawing which indicate, in an illustrative manner merely, how the invention may be practiced, and will be pointed out in the appended claims.

In the drawing,

Fig. 1 is a perspective view of a lasted shoe which has been operated upon in accordance with the invention;

Fig. 2 is a plan view of the bottom of the shoe shown in Fig. 1 after a roughing operation has been performed thereon;

Fig. 3 is a side elevation of certain parts of a staple lasting machine equipped with a marking device;

Fig. 4 is a detail in perspective of parts shown in Fig. 3; and

Fig. 5 is a detail in perspective of a modified marking tool.

A shoe having the overlapped margin of its upper provided with indicating marks to show the roughing machine operator how far outwardly of the shoe the roughing operation should extend is illustrated in Fig. 1, such marks being indicated by the numeral 10 and consisting, as illustrated, of a line of perforations made through the upper and lining at a predetermined distance from the edge of the shoe bottom. In this figure also are indicated at 12 metallic fastenings by which the upper is secured in lasted position to the insole.

A machine for thus preparing the upper of a shoe for the roughing operation is illustrated in Fig. 3, which shows the operating instrumentalities of a staple side lasting machine of the type disclosed in Letters Patent of the United States No. 1,815,297, granted July 21, 1931, on the application of George Goddu. As described in said patent, the machine is provided with a gripper 14 for tensioning successive portions of an upper over the bottom of a last and with staple forming and inserting mechanism which is movable bodily toward and from the shoe in directions inclined to the bottom face of the insole and serves, in its movement toward the shoe, to work the margin of the upper over the insole into position to be fastened. The staple forming and inserting mechanism is carried by a movable slide 16 which derives its movement from a cam on the main shaft of the machine. A staple driver 18 is secured to a driver slide 20 which is movable in a guideway formed in a bracket 22 attached to a forward extension of the slide 16. The driver slide 20 is operated by a lever 24 which is pivoted on a stud 26 on a forward extension of the slide 16 and is provided with a block 28 which enters a recess in the driver slide 20. The lever 24 is actuated by a bell-crank lever 30 pivoted on a stud 32. A strong torsion spring 34 surrounds the stud 32 which, after being tensioned, can impart driving motion to the driver 18 through the levers 24 and 30, a roll on the bell-crank lever 30 entering a slot 36 in the lever 24 to form a connection

between the two levers. As the slide 16 moves toward the shoe during the operation of the machine, a latch 38 pivotally mounted at 40 on a lever 42 which is pivoted at 44 to the frame of the machine remains in engagement with a plate 46 fast on the bell-crank lever 30, the bell-crank lever 30 being therefore turned in a direction to tension the spring 34. Driving of the staple is effected when the engagement between the latch 38 and the plate 46 is broken, this taking place at the proper time through a cam controlling movement of the lever 42. A complete description of the construction and operation of the parts above mentioned will be found in the patent already referred to.

To adapt the machine for preparing the overlapped portion of a shoe upper for a roughing operation, as illustrated in Fig. 1, mechanism for perforating the upper at a predetermined distance from the edge of the insole is provided. A plate 48, which is secured to the head frame of the machine and carries an edge gage 50, is provided with a forwardly projecting lug 52 in which a rock-shaft 54 is journaled. Secured to the rock-shaft 54 is a punch-carrying member 56 on the forward end of which a small tubular punch 58 is mounted. Also secured to the rock-shaft 54 is an upstanding arm 60. Formed on or rigidly attached to the bell-crank lever 30 is a lug 62 through which a screw 64 is threaded and is held in adjusted position by means of a lock nut 66. Counterclockwise movement of the arm 60 is limited by contact of the arm 60 with an adjusting stop screw 68 threaded through a lug 70 on the plate 48, and the arm is held normally contacting with the screw 68 by means of a spring 72 connected between the plate 48 and the arm 60. When, in the operation of the machine, the latch 38 is released and the bell-crank lever 30 is swung under the action of the torsion spring 34 to actuate the staple driver 18, the screw 64 strikes against the rear face of the arm 60, thus causing the rock-shaft 54 to be turned clockwise and the punch 58 carried by the member 56 to be driven through the upper and lining materials of the shoe upper, thus forming a perforation therein. The punch 58 is preferably located at one side of the staple nozzle and as close as practicable thereto. As illustrated in Fig. 3, the punch is behind the nozzle; that is, viewing the machine from the front, the punch is at the right-hand side of the nozzle.

The work is preferably prepared for the operation of the described machine as follows: An insole, the margin of which has been coated with cement and allowed to dry, is secured to the bottom of a last and an upper assembled upon the last and pulled over. A shoe thus prepared is presented to the machine with its edge against the edge gage 50, and in the operation of the machine successive portions of the upper along the side of the shoe are seized by the gripper 14, tensioned heightwise of the shoe, and carried over the shoe bottom. The slide 16 advances, causing the nozzle of the stapling mechanism to press the tensioned portion of the upper into lasted position against the bottom of the insole. Then the latch 38 is released and a staple driven through the upper and into, but not through, the insole to secure the upper in lasted position. Simultaneously with the driving of the staple, the screw 64 strikes the arm 60 and actuates the punch 58 to perforate the upper at a predetermined distance from the edge of the shoe, since the shoe is held against the edge gage 50, and at

a predetermined point with respect to the driven staple. Since the punch 58 is tubular, it will, in making the perforations, remove small disks of upper material so that the underlying face of the insole is exposed in the perforation. Preferably the lasting of the toe and heel portions of the shoe is performed subsequently to the side lasting operation described and upon machines of a different type, the toe portion being frequently lasted by use of a machine of the bed type and the heel portion being lasted either on that machine or on a heel-seat lasting machine. In either case, the overlapped upper at the end portions of the shoe may be secured in lasted position by means of tacks, as indicated in Figs. 1 and 2.

In Fig. 5 is illustrated another kind of marking tool 74 which may be used in place of the tubular punch 58. The tool 74 is provided with an edge extending substantially parallel to the edge of the shoe bottom at the operating point and located in predetermined relation to the edge of the shoe to locate the outer limit to which the roughing operation should be carried. In operation, the edge of the tool 74 will, if blunt, make a linear indentation 76 in the leather or, if sharp, may cut at least through the grain of the leather, in either case indelibly marking the leather for the purpose above described.

As above indicated, the roughing operation has hitherto called for a considerable amount of care and judgment upon the part of the operator and has consequently been rather slow since it is necessary to carry the roughing operation near enough to the edge of the shoe bottom to secure proper subsequent adhesion but must not be carried beyond the area of subsequent union of the shoe and outsole, since, in that case, a roughed portion of the upper would be visible in the completed shoe. The edge of the shoe bottom is generally sufficiently well defined at the toe portion to enable the operator to rough the overlapped upper at this portion to the required extent without much difficulty, and the heel portion is not usually roughed, but at the sides, particularly in the shanks of many shoes, the shape of the last is such that the edge of the shoe bottom (that is, the boundary of the subsequent area of contact between the shoe bottom and the outsole) is not well defined. Thus, in roughing the shank the operator has hitherto had to work very carefully, and, when judging by the eye alone to what extent to rough the upper or at best when obtaining some indication of such extent from the edge of the insole underneath the upper, such edge usually being far from easily determinable under the overlapped margin of the upper, it has often been the case that the roughing was carried too far or not far enough. By the practice of the method of the present invention, however, a line of perforations is made along the sides of the shoe bottom in predetermined position close to the edge of the shoe bottom and the roughing machine operator is given a definite indication of the outer limit to which the roughing should be carried. As indicated in Fig. 2, the roughing at the sides of the shoe is confined just within a boundary clearly defined by the outside extremities of the perforations, which boundary accurately defines the proper area for roughing, the perforations being sufficiently close together to enable the operator to follow such boundary quite readily. It will be realized that a line of perforations is particularly suitable for indicating the extent to which the roughing operation should

be carried since they provide indelible marks that cannot be destroyed or obscured by the roughing operation. Also, since these perforations definitely depart out of the general plane of adjacent portions of the shoe bottom surface, they are much better adapted for the purpose of providing indicating marks for this purpose than mere superficial indications such as pencil marks or even a raised line which would be quickly obscured by dust or effaced by the action of the roughing tool. A further advantage of the perforations lies in the fact that it sometimes happens that surface fibers of material are torn up in such manner that the tearing tends to extend somewhat beyond the actual locality of contact between the tool and the upper, an effect which obviously increases the difficulty of obtaining an accurately defined boundary on the roughened area. When perforations are made in the upper, it will be evident that tearing of the surface material begun in the proximity of the perforations will not continue outwardly beyond such perforations, so that the perforations to some extent reduce the tendency of such undesirable surface tearing to occur. Still further to meet such conditions, it is, of course, possible to make the indicating marks closer together, to alter their shape, or, particularly if they do not extend entirely through the upper, to increase their dimensions in the direction of the shoe edge, as illustrated in Fig. 5, so that their effect will be more nearly that of a continuous cut or incision in the surface of the upper.

After roughing, the shoe bottom presents the appearance indicated in Fig. 2 and is ready to have adhesive, such for example as pyroxylin cement, applied to the roughened surface of the upper and an outsole attached thereto by cement in the usual manner, the plugs of dried cement which form in the perforations cooperating with the roughing to effect secure attachment of the sole. It will be understood that if, as suggested, the surface of the insole has been coated with adhesive, the cement introduced into or entering the perforations will, at the bottom of those perforations, find in the adhesively coated face of the insole a surface apt for forming a bond therewith, while some of the said adhesive may flow or be forced between the lining and insole or between the upper and lining so that, as a result, there may be formed what are in effect elements of a seam which consist of a rivet of dry adhesive having, it may be, not only direct adhesive attachment to the insole at one end and to the outsole at the other end, but also flanges or heads of dried adhesive extending at more than one place along the length of the rivet between the layers of the shoe parts lying over the insole and not only securing such layers to each other but securing the rivet element in the shoe. These elements strengthen the attachment between the upper and outsole effected by the adhesion of the roughed upper to the outsole.

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

1. That improvement in methods of making shoe which consists in progressively working successive portions of an upper over the bottom of an insole, securing the upper in lasted position, and simultaneously cutting a series of perforations in the upper, the material being removed from the perforations to expose the insole through the perforations.

2. That improvement in methods of making

shoes which consists in progressively working successive portions of an upper over the bottom of an insole, inserting fastenings to secure the upper in lasted position, and simultaneously im-

5 pressing a series of indications in the upper at a predetermined distance from the edge of the shoe, to serve as means for determining the extent of a subsequent operation.

3. The method of making shoes which consists in progressively lasting an upper over an insole and simultaneously marking the upper along a line to indicate the outer boundary of the surface to be treated by a roughing operation, and then roughing the upper to the extent indicated by

15 said boundary.
4. That improvement in methods of making shoes which consists in lasting an upper and simultaneously removing disks of material from the upper to expose the insole and prepare the upper for the attachment of an outsole to the upper and insole by cement.

5. That improvement in methods of making shoes which consists in lasting an upper and, in conjunction with said lasting operation, removing material from the upper to prepare the upper for the attachment thereto of an outsole by cement.

6. That improvement in methods of making shoes which consists in progressively working an upper into lasted position with respect to an insole, securing each portion of the upper in lasted relation to the insole, and simultaneously removing material from the upper to prepare the upper for the attachment thereto of an outsole by cement.

7. That improvement in methods of making shoes which consists in working an upper over an insole and simultaneously cutting out portions of the upper to expose the insole to enhance the adhesive union between the upper and an outsole attached thereto by adhesive and to provide a cement connection between the insole and outsole.

8. That improvement in methods of making shoes which consists in working an upper over an insole and simultaneously cutting perforations through the upper to enhance the adhesive union between the upper and an outsole attached thereto by adhesive, filling the perforations with pyroxylin adhesive, and applying the outsole.

9. That improvement in methods of making shoes which consists in working an upper over an insole and simultaneously cutting perforations through the upper to expose the insole and to provide adhesive union between the insole and an outsole attached to the upper by adhesive, applying pyroxylin adhesive to the perforated upper, and then applying the outsole.

10. As a step product, a lasted shoe comprising an insole, and an upper lasted over upon the insole and having a line of perforations from which upper material has been removed at a predetermined distance from the edge of the insole to provide a guide for roughing the overlapped margin of the upper.

11. That improvement in methods of making shoes which consists in assembling an insole and an upper upon a last, lasting the upper, forming perforations through the upper to expose the insole at a predetermined distance from the edge of the insole, applying pyroxylin cement to the upper to fill the perforations and cause the cement to reach the surface of the insole, and attaching an outsole to the upper by means of pyroxylin cement.

12. That improvement in methods of making shoes which consists in assembling an insole and

an upper upon a last, lasting the upper, forming perforations through the upper to expose the insole, applying pyroxylin cement to the upper to fill the perforations and cause the cement to reach the insole, and attaching an outsole to the upper by means of pyroxylin cement.

13. That improvement in methods of making shoes which consists in coating the margin of an insole with pyroxylin cement and allowing it to dry, assembling an insole and an upper upon a last, lasting the upper, forming perforations through the upper to expose the layer of cement on the insole, applying pyroxylin cement to the upper to fill the perforations and cause the cement to reach the layer of cement on the insole, and attaching an outsole to the upper by means of pyroxylin cement.

14. That improvement in methods of making shoes which consists in assembling an insole and an upper upon a last, lasting the upper progressively by working successive portions of the upper over the shoe bottom, forming perforations through each successive portion of the upper after it is worked into lasted position to expose the insole, applying pyroxylin cement to the upper to fill the perforations and cause the cement to reach the insole, and attaching an outsole to the upper by means of pyroxylin cement.

15. That improvement in methods of making shoes which consists in assembling the insole and an upper upon a last, lasting the upper progressively by working successive portions of the upper over the shoe bottom, forming perforations through each successive portion of the upper after it is worked into lasted position at a predetermined distance from the edge of the insole, applying pyroxylin cement to the upper to fill the perforations and cause the cement to reach the insole, and attaching an outsole to the upper by means of pyroxylin cement.

16. That improvement in methods of making shoes which consists in coating the margin of an insole with pyroxylin cement and allowing it to dry, assembling the insole and an upper upon a last, lasting the upper progressively by working successive portions of the upper over the shoe bottom, forming perforations through each successive portion of the upper after it is worked into lasted position to expose the layer of cement on the insole, applying pyroxylin cement to the upper to fill the perforations and cause the cement to reach the layer of cement on the insole, and attaching an outsole to the upper by means of pyroxylin adhesive.

17. In a shoe machine, the combination of means for working successive portions of an upper over the bottom of a last, means for forming openings through the upper, and means for inserting fastenings to hold each overworked portion in overworked position.

18. In a shoe machine, the combination of means for working successive portions of an upper over the bottom of a last, means for inserting fastenings to hold the upper in lasted position, and means for forming an indentation in each overlapped portion of the upper at a predetermined distance from the edge of the last bottom.

19. In a shoe machine, the combination of shoe locating means, means for working successive portions of an upper over the bottom of a shoe, means for inserting fastenings to hold the upper in lasted relation to the shoe bottom, and means for forming incisions in the upper at a predetermined distance from the edge of the shoe bottom.

20. In a shoe machine, the combination of an edge gage, means for working successive portions of an upper over the bottom of an insole on a last, means for inserting fastenings to hold the upper in lasted relation to the insole, and means for making indicating marks on the upper at a predetermined distance from the edge of the insole.
21. In a shoe machine, the combination of means for working an upper in lasted position, means for inserting fastenings to hold the upper in lasted position, and means for perforating the upper after it has been secured.
22. In a shoe machine, the combination of a gripper for working successive portions of an upper over an insole progressively, means for inserting a fastening to hold each portion of the upper in lasted relation to the insole, and means for forming holes in the upper.
23. In a shoe machine, the combination of an edge gage against which a shoe is held by the operator, a gripper for working successive portions of an upper over an insole progressively, means for inserting fastenings to hold the upper in lasted relation to the insole, a punch in predetermined relation to the edge gage, and means operated by the fastening inserting means for actuating the punch.
24. In a shoe machine, the combination of means for tensioning successive portions of upper materials over a last, means for inserting metallic fastenings to hold the upper materials in lasted relation to an insole, and means for perforating the upper materials.
25. In a shoe machine, the combination of means for tensioning successive portions of upper materials over a last, means for inserting metallic fastenings to hold the upper materials in lasted relation to an insole, and means for forming openings in the upper materials.
26. In a shoe machine, the combination of means for tensioning successive portions of upper materials over a last, means for inserting metallic fastenings to hold the upper materials in lasted relation to an insole, means for forming openings in the upper materials, and a gage for locating the shoe in predetermined relation to the means for forming openings.
27. In a shoe machine, the combination of means for working successive portions of an upper over the bottom of a last, means for inserting fastenings to secure the upper in lasted position, and means for perforating the upper between the fastenings and the edge of the last after the upper is secured.
28. In a shoe machine, the combination of means for working successive portions of an upper over the bottom of a last, and a tubular punch for perforating the upper at a predetermined distance from the edge of the last bottom.
29. In a shoe machine, the combination of shoe locating means, means for working successive portions of an upper over the bottom of a shoe, and means for cutting out material to form openings in the upper at a predetermined distance from the edge of the shoe bottom.
30. In a shoe machine, the combination of means for working an upper in lasted position, means for inserting fastenings to secure the upper in lasted position, and means for punching holes in the upper after it has been secured.
31. In a shoe machine, the combination of a gripper for working successive portions of an upper over an insole progressively, means for inserting a staple to hold each portion of the upper in lasted relation to the insole, and means for making linear indentations in the upper.
32. In a shoe machine, the combination of an edge gage against which a shoe is held by the operator, a gripper for working successive portions of an upper over an insole progressively, means for inserting staples to hold the upper in lasted relation to the insole, a punch in predetermined relation to the edge gage, and means operated by the fastening inserting means for actuating the punch.

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