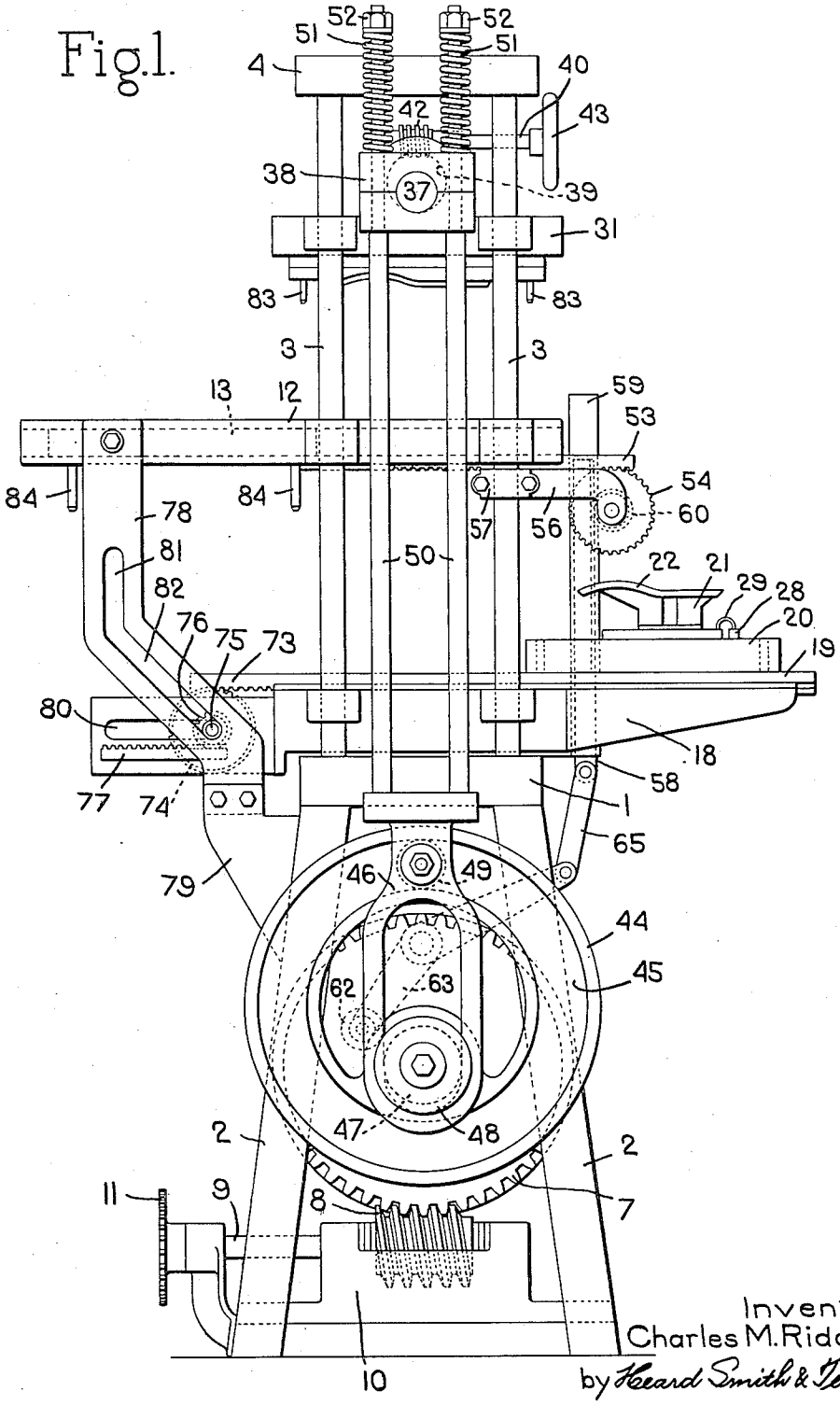
Jan. 28, 1936. C. M. RIDDOCK 2,029,195

SHOE SOLE APPLYING MACHINE

Filed Dec. 26, 1934 4 Sheets-Sheet 1

Fig.1.



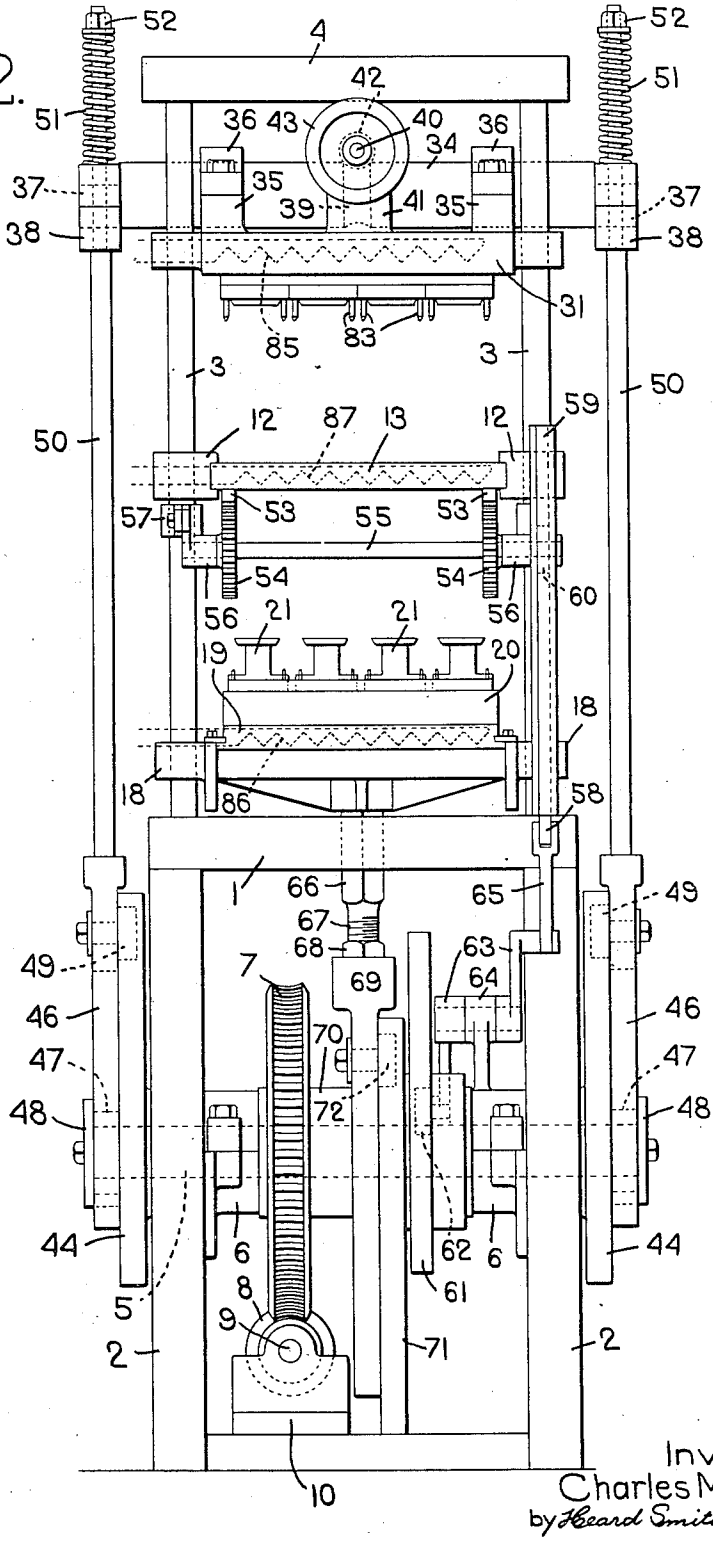
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SHOE SOLE APPLYING MACHINE

Filed Dec. 26, 1934 4 Sheets-Sheet 2

Fig. 2.



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SHOE SOLE APPLYING MACHINE

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Fig. 3.

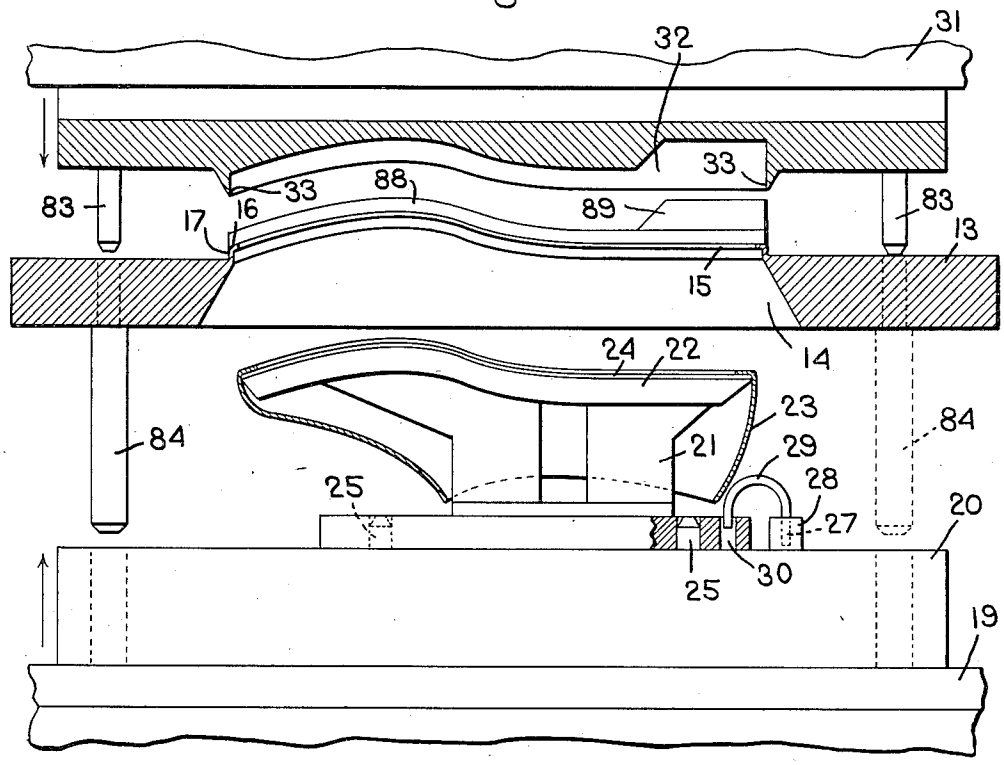
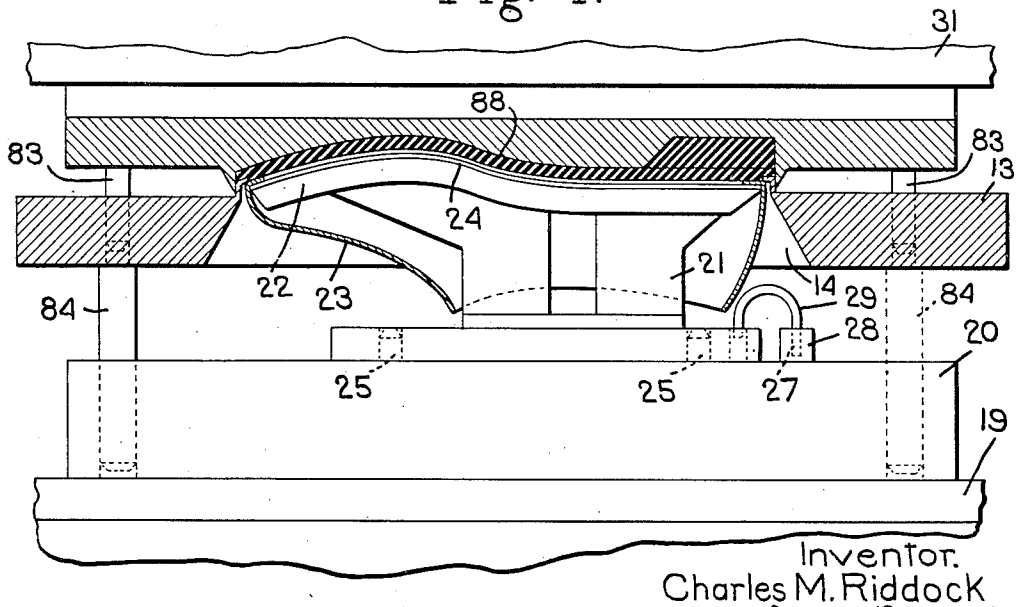


Fig. 4.



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SHOE SOLE APPLYING MACHINE

Filed Dec. 26, 1934 4 Sheets-Sheet 4

Fig. 5.

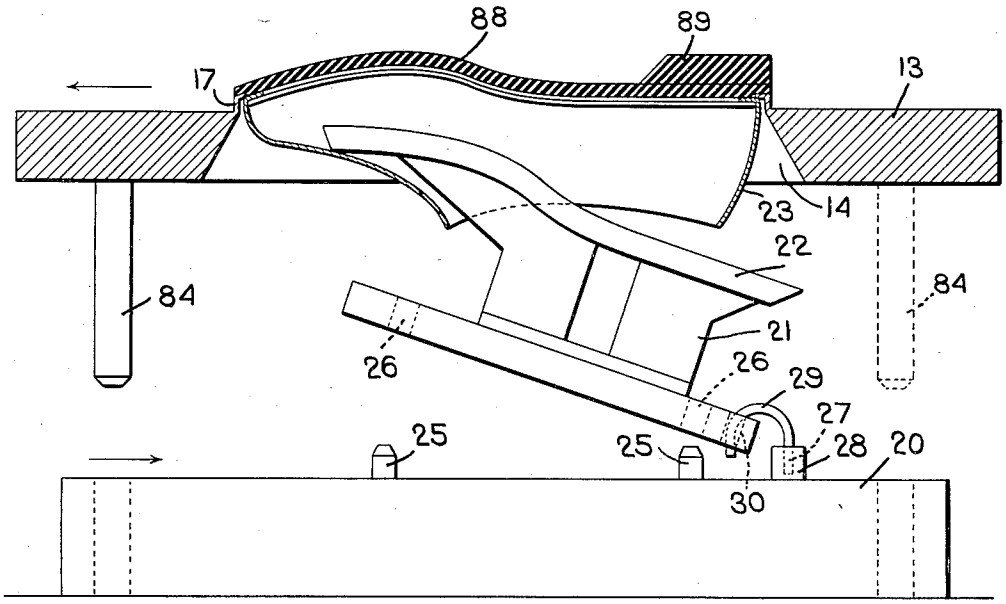
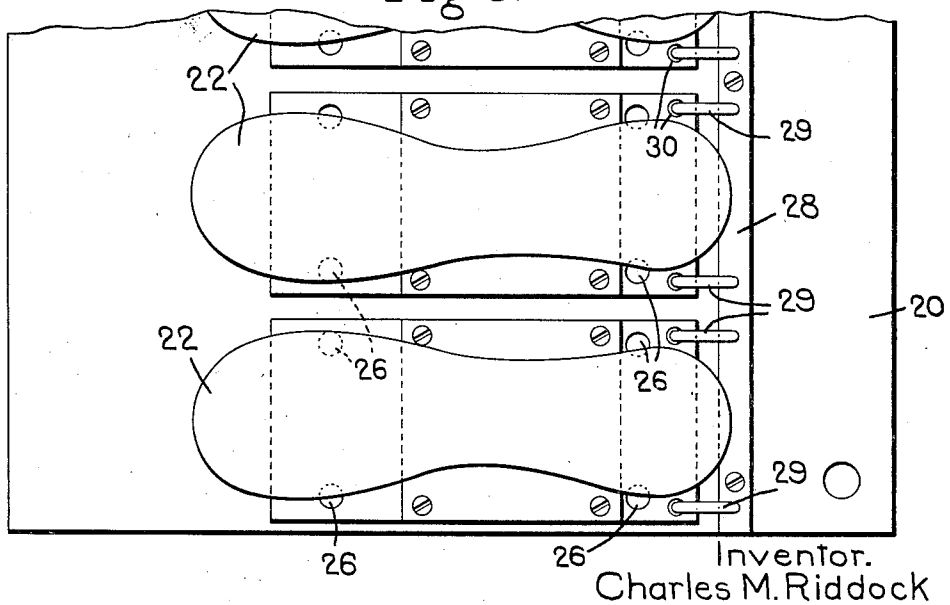


Fig. 6.



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Patented Jan. 28, 1936

2,029,195

UNITED STATES PATENT OFFICE

2,029,195

SHOE SOLE APPLYING MACHINE

Charles M. Riddock, Andover, Mass.

Application December 26, 1934, Serial No. 759,213

23 Claims. (Cl. 18—17)

This invention relates to a machine for applying a shoe outer sole adhesively to an assembled shoe upper and inner sole.

The object of the invention is to provide such a machine in which the operations necessary for applying the outer sole to the upper and inner sole are performed rapidly and efficiently and with a minimum amount of manipulation by the operator.

The object of the invention is further to provide such a machine in which the last supporting the assembled upper and inner sole when the outer sole is applied thereto is thereafter automatically withdrawn from the soled shoe and brought into position to receive the next assembled upper and inner sole.

The object of the invention is further to provide such a machine in which the soled shoe at the completion of the operation is left in a position in the machine from which it is readily removed by the operator.

The object of the invention is further to provide such a machine in which one or a plurality of soling operations may be simultaneously performed.

The object of the invention is further to provide such a machine in which the outer soles may either be cut to the required size and shape before being placed in the machine or may be cut to the required size and shape as a part of the operation of the machine.

These and other objects and features of the invention will appear more fully from the accompanying description and drawings and will be particularly pointed out in the claims.

The machine illustrated in the drawings as a simple and preferred embodiment of the invention is shown as adapted for the soling of four shoes at the same time, but it will be seen that the number of shoes thus soled depends only upon the size and strength of the elements of the machine and the convenience of the operator, the principle of operation being the same whether one or more shoes are soled. Consequently in describing the machine, it is only necessary to describe the operation with respect to a single shoe.

The elements of the machine which support and act directly upon the shoe in the sole applying operation are in most respects similar to those disclosed in my pending application, Serial No. 734,985, filed July 13, 1934, wherein the form of dies which act to cut the outer sole from a strip of rubber or other suitable material during the outer sole-applying operation is illustrated.

In the drawings:

Fig. 1 is a side elevation of the machine with the parts in the position occupied at the beginning of the cycle of operations.

Fig. 2 is a front elevation of the machine.

Fig. 3 is a detail of the elements which act directly in the applying of the outer sole and with these elements shown in the position occupied when the final vertical movements in alignment involved in the present operation are about to take place, some of the parts being shown in vertical cross section.

Fig. 4 is a view similar to Fig. 3 with the parts in the position occupied at the conclusion of the application of the outer sole.

Fig. 5 is a view of a portion of the elements shown in Figs. 3 and 4 with the parts in the position occupied when the last or support for the soled shoe is being withdrawn therefrom.

Fig. 6 is a detail in top plan view to illustrate a plurality of lasts or assembled upper and inner sole supporting elements.

The type of shoe upon which the machine of this invention is designed to operate is one in which a rubber outer sole either previously formed or formed during the operation of the machine is secured by adhesion to an assembled upper and inner sole. While the outer sole material is herein referred to as of rubber, it will be understood that this term includes any material which comprises as a constituent rubber or similar products and further that the term "outer sole" as used herein is to be understood as including the heel whether the heel portion be formed as an integral or separate part of the main sole portion. If the heel is formed as a separate part, it is integrally secured to the body of the outer sole so as to form essentially one piece therewith by vulcanization and preferably during the process of the application of the outer sole.

The shoe upper and inner sole may be made of any of the usual materials employed in this type of shoe and any suitable type of filler in connection with the inner sole may be employed.

In the application of the outer sole to the assembled upper and inner sole any suitable cement may be employed if and wherever necessary or desirable.

It will be understood also that such terms as "vertical", "upper" and "lower" applied to the machine are relative and refer to the machine with the parts in the position which they would normally occupy.

The machine of this invention comprises as its essential features, first, an open die having its upper surface of a width to support the portion of the shoe sole which extends beyond the upper, second, a lower base mounted to move vertically in alignment with the open die and preferably also to move laterally into and out of aligning position with the open die, third, a support herein conveniently referred to as a last having its upper portion of a size and shape to conform to the inner surface of an inner sole of an assembled shoe upper and inner sole and pivotally mounted at the heel end of its lower portion to the lower base, and, fourth, an upper base having a sole pressing die secured to or forming part thereof mounted to move vertically in alignment with the open die. In the best and preferred form of the invention, the open die is also mounted to move laterally toward and from its position in vertical alignment with the sole pressing die.

In the operation of these main features of the machine in its preferred form and with the parts separated to their extreme position, the last laterally removed from the open die is in a convenient position for the operator to place thereupon an assembled shoe upper and inner sole and the space above the open die is such that the operator may readily position thereupon the outer sole if preformed or, if not preformed, the strip of rubber from which the outer sole is to be formed. In the operation of the machine, the lower base moves laterally and preferably to some extent vertically to bring the last into alignment with the sole pressing die. The open die, if in an outward lateral position, at the same time moves into vertical alignment with the last and sole pressing die. The last then is moved vertically upward. The sole pressing die is moved vertically downward to bring the parts into the desired cooperative relation and secure the pressing of the outer sole into intimate contact with the assembled shoe upper and inner sole, with the outer sole at the same time being formed from the strip of rubber if that strip is employed. In this operation the last first comes into cooperative relation with the open die and then the sole pressing die moves into its final position. As the cycle of operations continues, the sole pressing die is first moved upward, then the last is moved downward and then back to its lateral position with the sole pressing die also moving to its extreme position. As the last moves vertically downward, it rocks on its pivot and is withdrawn from the soled shoe which is held by the rim or welt of the outer sole suspended on the open die. When the parts have moved to their extreme open positions, the soled shoe can readily be removed by the operator from the open die and the last is again in position to receive another assembled upper and inner sole. In the preferred form the open die will have moved laterally in a direction opposite to the last to a position where the removal of the soled shoe is greatly facilitated.

Simple and preferred mechanical elements are provided for operating these essential elements of the machine to give the sequence of operations thus described and enable the cycle of operations to be repeated automatically under the control of the operator.

The machine is also preferably provided with heating elements associated with the last and with the sole pressing die and also desirably with the open die so that the operation of vulcanization may be performed in the machine during its cycle of operations.

In the embodiment of the invention illustrated, the machine comprises a suitable frame. This frame is shown with an open bed plate 1 mounted on standards 2 from the floor, the width of the bed plate depending upon the number of lasts employed in the machine. From the bed plate extend upwardly a plurality of vertical guide bars 3, one being located conveniently near each corner of the bed plate, and these guide bars are mounted at their upper ends in a cap plate 4.

A main shaft 5 is journalled transversely of the machine in bearings 6 mounted on the standards 2. This shaft has secured thereto a worm wheel 7 driven by a worm 8 on a shaft 9 journalled in a base 10 secured to the standards 2 at the floor. The shaft 9 is driven from any suitable source of power, a sprocket wheel 11 being shown thereon for connection to the power. Since the power unit for driving the machine forms no part of the present invention, it may be of any suitable type but of a character that it may be controlled to cause the machine to go through one cycle of operations and stop and to be otherwise operated as desired.

A mid-support in the form of a pair of guide rails 12 is mounted on the guide bars 3. These rails extend laterally to the left, viewing Fig. 1, and are rigidly mounted against vertical movement. A mid-base in the form of a plate 13 is mounted to slide in the guide bars 12 of the mid-support. This mid-base is provided with a large aperture 14 at the upper edge of which is formed or secured the open die 15. This open die has its upper surface 16 of a width to support the upper portion of the shoe sole extending beyond the upper or that portion which corresponds to the welt and is in the form of a narrow rim which may project slightly in between the upper and the outer sole. If the open die is to assist in the cutting of the outer sole from a strip of rubber or other material, its outer peripheral edge 17 is formed vertically and of the shape and size of the desired perimeter of the outer sole.

A lower support in the form of a pair of guide rails 18 is mounted to move vertically on the guide bars 3 and extends laterally in both directions from the frame. A lower base shown as a plate 19 is mounted to slide in the guide rails 18 of the lower support. This lower base is preferably built up to any desired thickness by a plate 20 thus enabling its vertical distance from the open die to be accurately determined. A last 21 having its upper portion 22 of a size and shape to conform to the inner surface of the inner sole of an assembled shoe upper 23 and inner sole 24 is pivotally mounted at the heel end of its lower portion to the lower base. As many of these lasts are provided as may be desired, four such lasts being shown in a row thus pivotally mounted on the lower base. Each last must be accurately positioned on the base and for that purpose cooperating vertically telescoping elements are provided on the last and the lower base. These are shown as vertical posts 25 secured in the plate 20 telescoping with corresponding apertures 26 in the lower portion of the last. With this construction the pivotal connection between the heel end of the lower portion of the last and the lower base must be such as to enable the last to rock onto and off the post 25. For this purpose there is provided a loose pivotal connection comprising vertical posts 27 removably mounted in a rib 28 on the plate 20 and terminating in semicircular

upper ends 29 which enter loosely apertures 30 in the lower portion of the last.

While in the specific construction illustrated the lower base, or that portion on which the last is mounted, is shown as sliding transversely of the machine in its lateral movement, it will be understood that the important thing is that the last and its base shall move laterally between a position of vertical alignment with the sole pressing die and a position laterally of, as in this case in front of, the machine where it is readily accessible. Consequently this lateral movement may take place in any suitable path to secure this broad result.

The upper base is in the form of a solid plate 31 mounted to move vertically on the guide bars 3 and the sole pressing die is secured to this upper base, there being, of course, as many sole pressing dies as there are lasts. The sole pressing die is shown as presenting a cavity 32 conforming in size and shape to the outer sole and preferably, and always in the case when it acts as a cutting die, having a peripheral cutting edge 33 which has a telescopic fit with the periphery 17 of the corresponding open die.

As already pointed out, the vertical position of the last 21 with respect to the lower base 19 so as to secure accurate position of the supported assembled shoe upper and inner sole with respect to the open die is secured by varying the thickness of the plate 20. Similarly the position of the sole pressing die is vertically adjustable with respect to its support to secure the correct position of this die with respect to the open die. In the construction illustrated, the upper base 31 is mounted upon a vertically adjustable upper support. This upper support is shown as a pair of bearing blocks and a horizontal shaft. This horizontal shaft 34 is journalled in bearings 35 projecting upward from the upper base 31 and provided with removable caps 36. The outer ends 37 of the shaft 34 are eccentric and journalled in the two-part bearing blocks 38 exteriorly of the frame. The central portion of the shaft 34 is formed with a worm wheel 39 and a small shaft 40 in a lug 41 upstanding from the upper base 31 is provided with a worm 42 engaging the worm wheel and at the front with a hand wheel 43. Consequently by turning the hand wheel 43 the vertical position of the lower base 31 and the sole pressing die is adjusted with respect to the bearing blocks 38.

Suitable means are provided for giving the required movements to the sole pressing die, the open die, and the last and in the form of the invention illustrated these movements are secured by connections operated from the main shaft 5 of the machine.

For operating the sole pressing die this main shaft 5 is provided at each side exteriorly of the frame with cams 44, each of which has a face cam groove 45. A link member is provided at each side of the frame connecting the corresponding bearing block 38 and operated by the corresponding cam groove 45. Each link member is shown as comprising at its lower end a base 46 provided with a slot fitting over an anti-friction roller 47 on the end of the main shaft and held in position by a washer 48 secured to the end of the shaft. The base 46 has journalled thereon a roll 49 constituting a cam follower riding in the groove 45. From the base 46 extends upwardly a pair of rods 50. These rods at their upper ends are reduced in size and pass through the bearing blocks 38. The bearing blocks rest against the shoulders formed by the reduced portions. Powerful helical springs 51 on the reduced ends of the rods 50 rest against the top of the bearing blocks and are held under compression by nuts 52 threaded on the upper ends of the rods. These springs allow a yielding pressure to be exerted by the sole pressing die on the sole at the end of the sole pressing operation.

In the preferred form of the invention illustrated, the open die is moved to and from its position in vertical alignment with the sole pressing die and last laterally of the frame and in this case to the rear. For this purpose the mid-base 13 carrying the open die is provided with a pair of rack bars 53 extending forward and engaging pinions 54 on a shaft 55 journalled at its ends in brackets 56 clamped at 57 to the vertical guide bars 3. A vertical rack 53 sliding in a vertical guide 59 secured to the frame engages a pinion 60 at one end of the shaft 55 and this rack is reciprocated by a cam 61 on the main shaft. This cam is provided with a groove in which rides a follower roll 62 on one end of a bell crank lever 63 fulcrumed on a support 64 secured to the frame and the bell crank lever is connected at its other end by a link 65 to the rack bar 58.

The last, as already pointed out, has a vertical movement in alignment with the sole pressing die to and from the open die and also preferably a movement laterally, toward and from its position of vertical alignment, in this case from and to the front of the machine. For this purpose the lower support 18 which is mounted on the vertical guide bars 3 is provided with a depending standard 66 adjustably secured by the threaded portion 67 and the lock nut 68 in a base 69. This base is slotted as in the case of the base 46 and fits over the hub 70 of a cam 71 secured to the main shaft. This cam is provided with a cam groove in which rides the follower 72 journalled on the base 69. The lateral movement of the last is secured by moving the lower base 19 on the lower support 18. For this purpose the lower base 19 is provided with rearwardly projecting rack bars 73 engaging pinions 74 on a shaft 75. Smaller pinions 76 on the shaft 75 engage rack bars 77 secured to the rearward ends of the lower support 18. Arms 78 are secured to and depend from the rearward portion of the mid-support and are preferably secured at their lower ends to brackets 79 on the frame. Horizontal slots 80 are formed in the rearward portions of the lower support 18 and slots having a vertical portion 81 and a downward and forward inclined portion 82 are formed in the arm 78 and the shaft 75 at its ends rides in both the slot 80 and the slot 81—82. It will thus be seen that as the lower support 18 moves upward from the position shown in Fig. 1, the shaft 75 will be carried first laterally and upward and then vertically upward and consequently as the pinions 76 are in engagement with the laterally fixed racks 77, the shaft will be rotated to cause the pinions 74 in engagement with the rack bars 73 first to move the lower support 19 into vertical alignment with the sole pressing die and then to hold it stationary while it moves upward. When the lower support 18 moves downward, the reverse operation takes place.

Suitable means are provided for securing accurate registration of the sole pressing die, the open die, and the last during the final movements of the pressing die and last when in vertical alignment with the open die. For this purpose co-

operating vertically telescoping elements are provided on the upper base and mid-base and on the mid-base and lower base. In the construction illustrated a plurality of vertical pins 83 projecting downward from the upper base 31 register with corresponding apertures in the mid-base 13 and a plurality of vertical pins 83 projecting downward from the mid-base 13 register with corresponding apertures in the plate 20 of the lower base 19.

It is desirable that heat shall be provided and transmitted to the parts of the shoe and preferably that this heat shall be sufficient to enable vulcanization to take place. This is conveniently secured by providing electric heating elements in the machine. Such heating elements are shown diagrammatically at 85 embedded in the upper base 31 so as to heat the sole pressing die, at 86 embedded in the lower base 19 so as to heat the last 21, and preferably also at 87 embedded in the mid-base 13 to heat the open die.

The operation of the machine will be apparent from the foregoing description. When the machine is started, the parts stand in the position shown in Fig. 1. When the machine is ready for starting, the operator then places upon each of the one or more lasts 21 employed the assembled shoe upper and inner sole. If the outer soles 33 including the heels 89 are preformed, they are then positioned or spotted on the open dies. If the outer soles are to be cut out, the required strips of rubber for the outer sole proper and the heel are laid over the open dies. These operations are readily performed because with the lasts at the front of the machine and the open dies at the rear, they are all readily accessible. The machine is then set in operation and in the construction illustrated simultaneously the sole pressing die moves downward, the open die moves inward into vertical alignment with the sole pressing die, and the last moves inward and at the same time partially upward into alignment with both. As the operation continues, the cams are so shaped that the last completes its upward vertical movement directed by the portions 81 of the slots to bring the assembled shoe upper and inner sole into proper relation with the open die well before the sole pressing die has completed its downward movement. Then as the operation further continues, the sole pressing die completes its downward movement pressing the outer sole, and cutting it out from the rubber strip when that construction is employed, and bringing the outer sole into adhesive relation to the assembled upper and inner sole, the springs 51 compressing as the final pressure is given. The parts are then in the position shown in Fig. 4. As the operation of the machine continues, the sole pressing die first rises and then the last moves downward again guided in the vertical slotted portions 81. As the lower base moves downward, the toe end of the last engaging the shoe upper causes the last to rock off the posts 25 about the loose pivotal connection at the heel end of the lower portion until the parts come into the position shown in Fig. 5. Then as the operation continues, the sole pressing die rising, the open die moving rearward and the lower base moving forward, the last is withdrawn from the soled shoe and the soled shoe is left suspended on the open die. When the cycle of operations is completed, the machine is again in the position shown in Fig. 1. The soled shoe is then in a position readily to be removed upward from the open die and the machine is in position to go through a new cycle of operations.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A shoe sole applying machine comprising an open die having its upper surface of a width to support the portion of the shoe sole extending beyond the upper, a lower base, a last having its upper portion of a size and shape to conform to the inner surface of the inner sole of an assembled shoe upper and inner sole and pivotally mounted at the heel end of its lower portion to the lower base, the said lower base being mounted to move vertically in alignment with the open die and to move laterally into and out of alignment with the open die to bring the last into and out of cooperative relation with the open die, and an upper base having a sole pressing die mounted to move vertically in alignment with and toward and from the open die, whereby when the assembled shoe upper and inner sole are positioned on the last and the sole is positioned on the open die and the upper and lower bases are moved to bring the sole pressing die and the last into cooperative relation with the open die the sole will be pressed into intimate engagement with the assembled upper and inner sole and when the bases are moved to their extreme opposite positions the last will be withdrawn from the soled shoe leaving it on the open die in position to be removed upward therefrom and the last will be in convenient position to receive another assembled upper and inner sole.

2. A shoe sole applying machine comprising the construction defined in claim 1, together with cooperating telescoping elements associated with the open die and lower base and with the open die and the upper base coacting during the final vertical movements into sole pressing position to ensure accurate registration.

3. A shoe sole applying machine comprising the construction defined in claim 1, in which the sole pressing die presents a cavity with a peripheral cutting edge conforming in size and shape to the outer sole and having a telescopic fit with the outer periphery of the open die.

4. A shoe sole applying machine comprising the construction defined in claim 1, in which the sole pressing die presents a cavity with a peripheral cutting edge conforming in size and shape to the outer sole and having a telescopic fit with the outer periphery of the open die, together with cooperating telescoping elements associated with the open die and lower base and with the open die and the upper base coacting during the final vertical movements into sole pressing position to ensure accurate registration.

5. A shoe sole applying machine comprising an open die having its upper surface of a width to support the portion of the shoe sole extending beyond the upper, a lower base, a last having its upper portion of a size and shape to conform to the inner surface of the inner sole of an assembled shoe upper and inner sole and pivotally mounted at the heel end of its lower portion to the lower base, an upper base having a sole pressing die, the said lower base and the said upper base being mounted to move vertically in alignment with the open die to bring the last and sole pressing die into and out of cooperative relation with the open die, and the open die and the lower base being mounted to move laterally in opposite directions into and out of alignment with the up-

per base when the upper base and lower base are vertically separated from the open die.

6. A shoe sole applying machine comprising the construction defined in claim 5, together with cooperating telescoping elements associated with the open die and lower base and with the open die and the upper base coacting during the final vertical movements into and out of sole pressing position to ensure accurate registration.

7. A shoe sole applying machine comprising the construction defined in claim 5, in which the sole pressing die presents a cavity with a peripheral cutting edge conforming in size and shape to the outer sole and having a telescopic fit with the outer periphery of the open die.

8. A shoe sole applying machine comprising the construction defined in claim 5, in which the sole pressing die presents a cavity with a peripheral cutting edge conforming in size and shape to the outer sole and having a telescopic fit with the outer periphery of the open die, together with cooperating telescoping elements associated with the open die and lower base and with the open die and the upper base coacting during the final vertical movements into sole pressing position to ensure accurate registration.

9. A shoe sole applying machine comprising the construction defined in claim 5, together with means acting, first, simultaneously to move the open die and the lower base from the extreme outward lateral positions to bring the open die and the last into alignment with the sole pressing die, second, to move the upper and lower bases vertically in alignment with the open die to bring the last and the dies into cooperative relation, third, to move the upper and lower bases vertically away from the open die causing the last to rock on its pivot and be withdrawn from the soled shoe leaving the soled shoe suspended on the open die and, fourth, to move the open die and the lower base to their extreme outward lateral positions.

10. A shoe sole applying machine comprising a frame, an upper support mounted to move vertically thereon, an upper base on the upper support, a sole pressing die on the upper base, a mid-support fixedly mounted on the frame and extending laterally therefrom, a mid-base mounted to slide laterally on the mid-support, an open die on the mid-base having its upper surface of a width to support the upper portion of the shoe sole extending beyond the upper, a lower support mounted for vertical movement on the frame and extending laterally therefrom in a direction opposite the mid-support, a lower base mounted to slide laterally on the lower support, a last having its upper portion of a size and shape to conform to the inner surface of the inner sole of an assembled shoe upper and inner sole pivotally mounted at the heel end of its lower portion to the lower base.

11. A shoe sole applying machine comprising the construction defined in claim 10, together with means acting, first, simultaneously to slide the mid-base and the lower base from the extreme outward lateral positions to bring the open die and the last into vertical alignment with each other and with the sole pressing die, second, to move the upper and lower bases vertically to bring the dies and last into cooperative relation, third, to move the upper and lower bases vertically away from the mid-base causing the last to rock on its pivot and be withdrawn from the soled shoe leaving the soled shoe suspended on the open die and, fourth, to slide the mid-base and the lower base to their extreme outward lateral positions.

12. A shoe sole applying machine comprising the construction defined in claim 5, together with means acting, first, simultaneously to move the open die and the lower base from the extreme outward lateral positions to bring the open die and the last into alignment with the sole pressing die, second, to move the upper and lower bases vertically in alignment with the open die to bring the last and the dies into cooperative relation with the lower base reaching its uppermost position well before the upper base reaches its lowermost position, third, to move the upper and lower bases vertically away from the open die causing the last to rock on its pivot and be withdrawn from the soled shoe leaving the soled shoe suspended on the open die and, fourth, to move the open die and the lower base to their extreme outward lateral positions.

13. A shoe sole applying machine comprising the construction defined in claim 5, together with means acting, first, simultaneously to move the open die and the lower base from the extreme outward lateral positions to bring the open die and the last into alignment with the sole pressing die, second, to move the upper and lower bases vertically in alignment with the open die to bring the last and the dies into cooperative relation with the lower base reaching its uppermost position well before the upper base reaches its lowermost position, third, to move first the upper base and then the lower base vertically away from the open die causing the last to rock on its pivot and be withdrawn from the soled shoe leaving the soled shoe suspended on the open die and, fourth, to move the open die and the lower base to their extreme outward lateral positions.

14. In a sole applying machine, a lower base, a last, cooperating vertically telescoping elements on the last and lower base for positioning the last on the base, and a loose pivotal connection between the heel end of the lower portion of the last and the base.

15. In a sole applying machine, the construction defined in claim 14 in which the pivotal connection comprises vertical posts secured in the base and presenting semicircular upper ends entering loosely apertures in the last to enable the last to rock on said ends and bring the telescoping elements into and out of registry.

16. A sole applying machine comprising a frame having vertical guides, an upper support mounted to move vertically on said guides and carrying a sole pressing die, a mid-support fixedly mounted on the frame and extending laterally therefrom, a mid-base carrying an open die mounted to slide laterally on the mid-support, a lower support mounted to move vertically on the vertical guides and extending laterally therefrom in a direction opposite the mid-support, a lower base carrying a last mounted to slide laterally on the lower support, a driven shaft, means operated by the driven shaft to give the required vertical movements to the upper and lower supports, means operated by the driven shaft to give the required lateral movements to said mid-base, an arm depending from the mid-support having a vertical and inclined slot, a horizontal slot in the lower support, horizontal racks on the lower support and on the lower base, and a shaft mounted to ride in the slots in the arm and lower support and having pinions secured thereto engaging respectively the racks on the lower support and

lower base acting to give the required lateral movements to the lower base upon the vertical movement of the lower support.

17. A sole applying machine comprising a frame having vertical guides, an upper support mounted to move vertically on said guides and carrying a sole pressing die, a mid-support fixedly mounted on the frame and extending laterally therefrom, a mid-base carrying an open die mounted to slide laterally on the mid-support, a lower support mounted to move vertically on the vertical guides and extending laterally therefrom in a direction opposite the mid-support, a lower base carrying the last mounted to slide laterally on the lower support, a driven shaft, means operated by the driven shaft to give the required vertical movements to the upper and lower supports, a rack on the mid-base and a cooperating pinion on the mid-support, a cam on the driven shaft and connections operated by said cam for rotating said pinion to give the required lateral movements to said mid-base, an arm depending from the mid-support having a vertical and inclined slot, a horizontal slot in the lower support, horizontal racks on the lower support and on the lower base, and a shaft mounted to ride in the slots in the arm and lower support and having pinions secured thereto engaging respectively the racks on the lower support and lower base acting to give the required lateral movements to the lower base upon the vertical movement of the lower support.

18. A shoe sole applying machine comprising an open die having its upper surface of a width to support the portion of the shoe sole extending beyond the upper, a lower base, a last having its upper portion of a size and shape to conform to the inner surface of the inner sole of an assembled shoe upper and inner sole and pivotally mounted at the heel end of its lower portion to the lower base, the said lower base being mounted to move vertically in alignment with the open die to bring the last into and out of cooperative relation with the open die, and an upper base having a sole pressing die mounted to move vertically in alignment with and toward and from the open die, whereby when the assembled shoe upper and inner sole are positioned on the last and the sole is positioned on the open die and the upper and lower bases are moved to bring the sole pressing die and the last into cooperative relation with the open die the sole will be pressed into intimate engagement with the assembled upper and inner sole and when the bases are moved to their extreme opposite positions the last will be withdrawn from the soled shoe leaving it on the open die in position to be removed upward therefrom and the last will be in position to receive another assembled upper and inner sole.

19. A shoe sole applying machine comprising the construction defined in claim 18, in which the sole pressing die presents a cavity with a peripheral cutting edge conforming in size and shape to the outer sole and having a telescopic fit with the outer periphery of the open die.

20. A shoe sole applying machine comprising an open die having its upper surface of a width to support the portion of the shoe sole extending beyond the upper, a lower base, a last having its upper portion of a size and shape to conform to the inner surface of the inner sole of an assembled shoe upper and inner sole and pivotally mounted at the heel end of its lower portion to the lower base, an upper base having a sole pressing die, the said lower base and the said upper base being mounted to move vertically in alignment with the open die to bring the last and sole pressing die into and out of cooperative relation with the open die, and the open die being mounted to move laterally into and out of alignment with the upper base when the upper base and lower base are vertically separated from the open die.

21. A shoe sole applying machine comprising the construction defined in claim 20, together with cooperating telescoping elements associated with the open die and lower base and with the open die and the upper base coacting during the final vertical movements into and out of sole pressing position to ensure accurate registration.

22. A shoe sole applying machine comprising the construction defined in claim 20, in which the sole pressing die presents a cavity with a peripheral cutting edge conforming in size and shape to the outer sole and having a telescopic fit with the outer periphery of the open die.

23. A shoe sole applying machine comprising the construction defined in claim 20, in which the sole pressing die presents a cavity with a peripheral cutting edge conforming in size and shape to the outer sole and having a telescopic fit with the outer periphery of the open die, together with cooperating telescoping elements associated with the open die and lower base and with the open die and the upper base coacting during the final vertical movements into sole pressing position to ensure accurate registration.

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