Oct. 5, 1948. J. S. KAMBORIAN 2,450,667

METHOD OF AND APPARATUS FOR USE IN LASTING FOOTWEAR

Filed Sept. 13, 1945

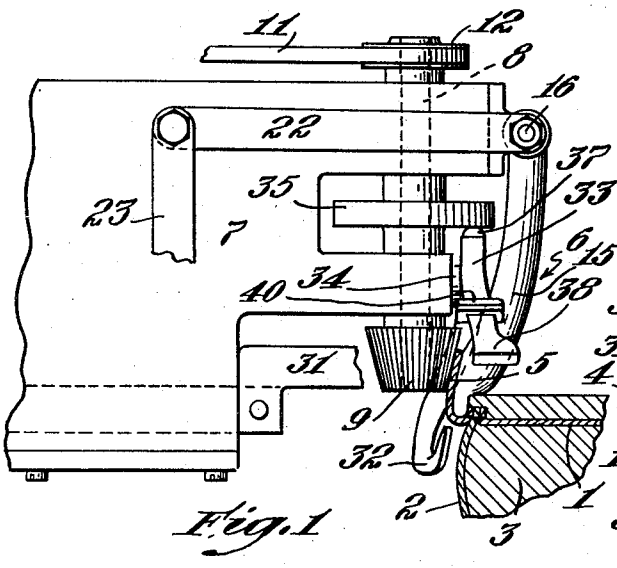


Fig. 1

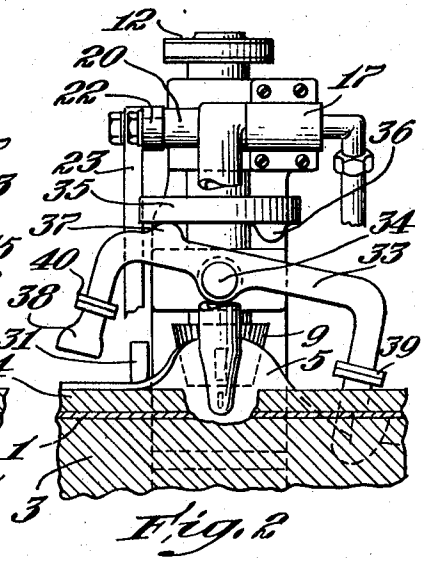


Fig. 2

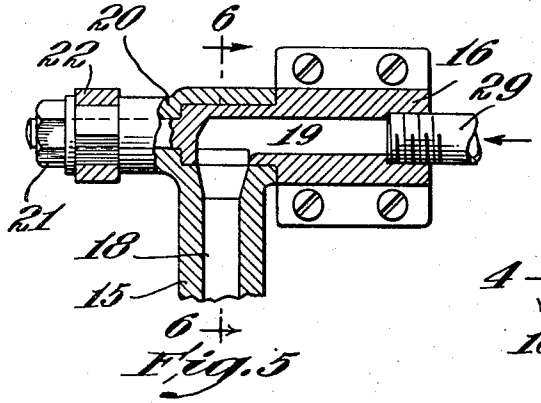


Fig. 5

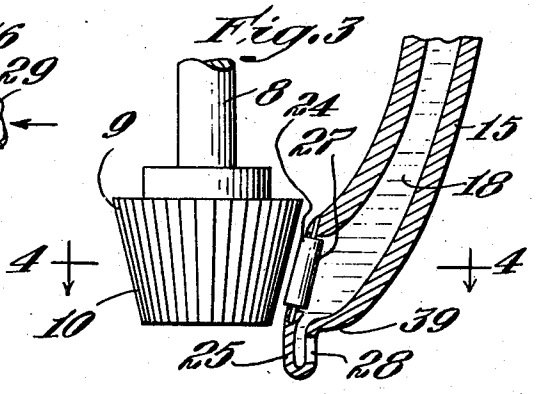


Fig. 3

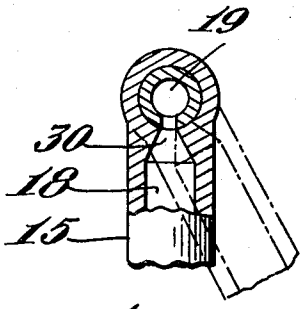


Fig. 6

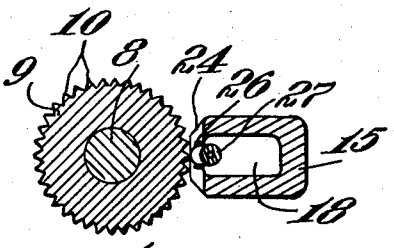


Fig. 4

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METHOD OF AND APPARATUS FOR USE IN LASTING FOOTWEAR

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26 Claims. (Cl. 12—1)

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This invention pertains to the manufacture of footwear and more particularly to an improvement in the method of lasting shoes and in apparatus for carrying out such method hereinafter set forth and claimed. The present invention is a further development of the invention set forth in the United States patents to Kamborian No. 2,251,284, dated August 5, 1941, and No. 2,254,224, dated September 2, 1941.

Those patents disclose means for gripping the lasting margin of the shoe upper, such means providing for the application of stress to draw the upper snugly about the last and at the same time setting up a relative movement of the shoe being lasted and the gripping means, in combination with a wiping means by which the lasting margin is brought into contact with the bottom surface of the shoe sole, to which it is secured as by a suitable adhesive. The present invention embodies the employment of means for lasting shoes in accordance with the underlying principles of the above patents.

Heretofore, when the lasting margin is to be secured to the sole by adhesive, it has been the usual practice to apply the adhesive to the inner face of the lasting margin and to the sole as a separate operation prior to the lasting. In order that the adhesive be in the proper condition to bond the wiped-on margin, the shoes, after the adhesive has been applied, must be allowed to stand, usually on racks, for a period of one or more hours. Even though this time may be reduced by subjecting the shoes to heat, nevertheless a delay takes place.

One object of this invention is to avoid such delay by providing means by which adhesive is applied to the inner surface of the lasting margin and to the edge wall of the shoe sole, such adhesive applying means also being one element of the upper gripping means and the adhesive being of the type which sets instantaneously so that the wiped-in lasting margin is bonded to the edge wall and bottom surface of the sole.

Another object of the invention is to provide, as one element of the gripping means for the lasting margin, a driven tapered roll, in the form of a truncated cone, the peripheral surface of which is knurled, fluted or provided with helical ribs as disclosed in said patents.

A further object of the invention is to provide means, actuated by the drive for the tapered roll, which means comprises a vertically reciprocable plow, by which the lasting margin of the upper is raised to a position perpendicular to the bottom surface of the shoe and a hammer by which the

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lasting margin, after being laid down, is subjected to a plurality of intermittent blows.

Other objects will appear from a consideration of the following description of one embodiment of the invention and of the accompanying drawings which illustrate such embodiment and in which

Fig. 1 is a fragmentary view in side elevation of the head of a machine embodying this invention;

Fig. 2 is a view in front elevation of such head;

Fig. 3 is an enlarged view, partially in section, of one detail of the machine;

Fig. 4 is a cross-sectional view taken along the line 4—4 of Fig. 3;

Fig. 5 is a sectional view of an element of the machine; and

Fig. 6 is a sectional view taken along the line 6—6 of Fig. 5.

The illustrated embodiment of this invention discloses the lasting of a shoe of the type known as a "California," "force-lasted" or "slip-lasted" shoe which comprises a sock lining 1 and an upper 2 attached to the margin of the sock lining (into which assembly a last 3 is introduced under pressure to tension the sock lining and upper), a platform 4 attached to the lasted assembly, usually being bonded thereto by adhesive, and a lasting margin 5 of the upper which is secured to the bottom surface of the platform 4. The "lasting margin" may be an integral extension of the upper or may be a "wrapper" attached to the upper as shown. In referring to the manufacture of shoes according to this invention, however, the term "shoe upper" is used in its generic sense to include the upper of a shoe of the ordinary type and the term "sole" or "sole member" is used broadly to include not only the platform 4 but also such elements as the insole, proper, of a shoe of the ordinary type whether welt, McKay or cement lasted, or the middle sole of a shoe of the "California" or "slip-lasted" type. While in the following description the "upper" and "sole" are of the type peculiar to "California," "force-lasted" or "slip-lasted" shoes the interpretation of these terms is not to be considered as limited thereto.

The accompanying drawings illustrate the head 6 of a machine of the general type disclosed in the above patents which head, while it differs in construction from the head of such machine, is adapted to carry out the underlying principles thereof.

The head 6 comprises a frame 7 in which is supported, in suitable bearings, a vertical shaft 8 carrying at its lower end a roller 9. The roller 9 is frusto-conical in form and provided on its

peripheral surface with a series of teeth 10 which, as will appear hereinbelow, facilitate the lasting operation. The shaft 8 is driven through a belt 11 and a pulley 12 from a motor or other source of power (not shown).

Coacting with the roller 9, to draw up the lasting margin 5 and advance the shoe, is a member 15 pivotally swinging from a pin 16 fixed to the forward end of the head by a strap 17. The member 15 has a central duct 18 which, in the position shown in Fig. 5, registers with an axial passage 19 in the pin 16. The upper end of the member 15 terminates in a sleeve 20 which surrounds one end of the pin 16 and is held thereon by a nut 21. Fixed upon the outer end of the sleeve 20 and held in place by the nut 21 is one end of an arm 22 the other end of which is connected by a bar 23 with a treadle (not shown) or other means by which the member 22 is swung in one direction. If desired, a spring (not shown) may be employed for moving the part 22 in the direction opposite to that in which it is moved by the treadle. The lower end of the member 15 terminates in a flat face 24 (Fig. 4) adjacent the periphery of the roller 9 and a downwardly extending tongue 25. In the face 24 is provided a vertically extending slot 26 which is substantially closed by a roller 27 mounted to be turned as will be described, and in the tongue 25 is provided a slot 28, both slots 26 and 28 opening into the duct 18.

The member 15 thus serves not only to assist in the pulling up of the lasting margin and the advancing of the shoe but also to apply adhesive to the inner surface of the margin and the outer edge of the sole. The adhesive is fed from a suitable source of supply through a pipe 29 to the passage 19 and thence into the duct 18 from which duct the adhesive is carried by the roller 27 to the lasting margin and is applied through the slot 28 to the edge of the sole. Obviously if it is not desired to apply adhesive to the sole edge the tongue 25 with its orifice 28 may be omitted. Likewise roll 27 may be omitted if desired, the margin of the upper then being gripped directly between that surface of the part 15 in which the slot 26 is located and the rotating roll 9. The throat 30 of the duct 18 is reduced so that when the member 15 is swung on the pin 16 into the position shown in dotted lines in Fig. 6 the flow of adhesive is cut off. Suitable heating means (not shown) may be applied to the member 15 and the other adhesive conductors if required to maintain the desired fluid condition in the adhesive.

Mounted upon the frame 7 for reciprocation, adjacent the roller 4, is a wiper 31 similar in construction to the wiper shown in the above patents and adapted to engage the outer surface of the lasting margin 5 after it has left the roller 9 and wipe it down against the sole 4.

When the shoe is presented to the machine, if the lasting margin is below the platform, successive portions of the margin will be raised by a plow 32 so that they pass freely between the roller 9 and member 15 as shown in Figs. 1 and 2. The plow 32 forms one end of a C-shaped bar 33 which is pivoted intermediate its ends upon a stud 34 projecting from the forward end of the machine. The bar 33 is so mounted that it normally assumes the position illustrated in the drawing with the plow engaging the edge of the turned margin. In order to raise the plow intermittently there is mounted upon the shaft 8 a disk 35 having on its under face a nub 36 so

positioned that, as the disk rotates, the nub 36 engages a nub 37 on the bar 33 and causes the bar 33 to rock and raise the plow 32. As soon as the nub 36 passes the nub 37 the bar 33 will resume its normal position. The bar 32 terminates at its other end on a hammer 38 which is so offset that when the bar 33 is tilted, the hammer 38 will strike against the lasting margin 5 wiped onto the bottom surface of the sole.

In order to permit adjustment of the plow 32 and hammer 38 both rotatively and vertically, unions 39 and 40 are introduced into the legs of the bar 33 as shown in Fig. 2. The operator is thereby enabled to make whatever adjustments are necessary to insure the proper functioning of both plow and hammer. While the bar 33 is shown in the drawing of such dimensions that the plow and hammer act upon the lasting margin at substantial distances from the margin pulling-up and shoe-advancing unit it will be understood that the bar may be of such dimensions that the plow and hammer will act close to the unit.

In operating the machine, the operator takes a shoe with the lasting margin turned back, raises that portion of the lasting margin at which the lasting operation is to start, and inserts the tongue 25 into the space between the lasting margin 5 and the edge wall of the sole 4, the lower end of the member 15 being preferably so formed that the operator can rest the sole 4 against the heel 39. The member 15, which at this time is in the dotted line position of Fig. 6, is then swung into the full line position of Fig. 6 in which the lasting margin 5 is clamped between the roller 27 and the roller 9 which is then or has already been set in operation. This movement of the member 15 is preferably done by depressing the treadle (not shown) but if desired the operator can do so by applying pressure upon the shoe. While the lasting margin 5 is tensioned adhesive is applied by the member 15 to the inner face of the margin and to the edge wall of the platform 4 and the shoe is advanced (to the left in Fig. 2). The roller 27 coacts with the roller 9 to grip the lasting margin and to advance the shoe at the same time that it applies the adhesive. As the lasting margin leaves the roller 9 and member 15, it is wiped down against the bottom surface of the sole by the wiper 31. In the meantime the bar 33 is actuated at each rotation of the shaft 8, causing the plow 32 to engage and turn up the lasting margin so that it will enter between the roller 9 and the member 15, and also causing the hammer 38 to strike the wiped-in margin and press it into closer contact with the bottom surface of the sole. The adhesive employed is preferably of the type which sets quickly when exposed to the air so that when the shoe is removed from the machine the margin will have been bonded to both the edge wall and the bottom surface of the sole.

While one embodiment of this invention has been shown and described in detail it will be understood that the invention is not limited thereto and that other embodiments may be made without departing from the spirit and scope thereof as set forth in the following claims.

I claim:

1. In a lasting machine of the class described, means for gripping the lasting margin and advancing the shoe, which means comprises a roller in contact with the outer surface of the margin and an adhesive applicator in contact with the

inner surface of the margin, said applicator acting to clamp the margin against the roller and to apply adhesive to the inner surface of the margin, a tongue on said applicator by which adhesive is applied to the wall of the shoe sole, and means for wiping said margin, as it passes from between the roller and the applicator, down upon the bottom surface of the shoe sole.

2. In a lasting machine of the class described, means for gripping the lasting margin and advancing the shoe, which means comprises a roller in contact with the outer surface of the margin and an adhesive applicator in contact with the inner surface of the margin, said applicator acting to clamp the margin against the roller and to apply adhesive to the inner surface of the margin, a tongue on said applicator by which adhesive is applied to the wall of the shoe sole, means for engaging the lasting margin and feeding it between the roller and the applicator, and means for wiping said margin, as it passes from between the roller and the applicator, down upon the bottom surface of the shoe sole.

3. In a lasting machine of the class described, means for gripping the lasting margin and advancing the shoe, which means comprises a roller in contact with the outer surface of the margin and an adhesive applicator in contact with the inner surface of the margin, said applicator acting to clamp the margin against the roller and to apply adhesive to the inner surface of the margin, a tongue on said applicator by which adhesive is applied to the wall of the shoe sole, means for wiping said margin, as it passes from between the roller and the applicator, down upon the bottom surface of the shoe sole, and means for intermittently impacting the wiped margin against the sole.

4. In a lasting machine of the class described, means for gripping the lasting margin and advancing the shoe, which means comprises a driven roller in contact with the outer surface of the margin and an adhesive applicator movable toward the roller into contact with the inner surface of the margin, the margin contacting surface of the applicator having a slot therein, means for supplying adhesive to the slot, and a roller in said slot by which roller adhesive is applied to the inner surface of the margin.

5. In a lasting machine of the class described, means for gripping the lasting margin and advancing the shoe, which means comprises a driven roller in contact with the outer surface of the margin and an adhesive applicator movable toward the roller into contact with the inner surface of the margin and the edge wall of the shoe sole, said applicator having a central duct to which adhesive is fed, slots opening into said duct, one slot leading from the margin contacting surface of the applicator and the other slot leading from the surface of the applicator in contact with the edge wall of the sole.

6. In a lasting machine of the class described, means for gripping the lasting margin and advancing the shoe, which means comprises a driven roller in contact with the outer surface of the margin and an adhesive applicator movable toward the roller into contact with the inner surface of the margin, said applicator including a tongue which contacts with the edge wall of the sole and having a central duct to which adhesive is fed, slots opening into said duct, one slot leading from the margin contacting surface of the applicator and the other slot leading from the wall contacting surface of the tongue of the applicator.

7. In a machine of the class described adapted to operate upon shoes having the lasting margin turned down away from the sole of the shoe, means for up-turning the lasting margin, said up-turning means including a plow which intermittently engages and turns up the lasting margin, means for gripping the margin so turned up by the plow, said gripping means including a roller and a driven shaft on which said roller is mounted, means for wiping the lasting margin in over the bottom surface of the sole and securing it thereto, a hammer for intermittently impacting the wiped-in margin against the sole, and means for operating said plow and hammer alternately.

8. In a machine of the class described adapted to operate upon shoes having the lasting margin turned down away from the sole of the shoe, means for up-turning the lasting margin, said up-turning means including a plow which intermittently engages and turns up the lasting margin, means for gripping the margin so turned up by the plow, said gripping means including a roller and a drive shaft for said roller, means for wiping the lasting margin in over the bottom surface of the sole, a hammer for intermittently impacting the wiped-in margin against the sole, a pivotally mounted member carrying the plow at one end and the hammer at the other end, and means carried by said shaft for actuating said member to cause the plow and hammer to act alternately upon the margin.

9. In a machine of the class described adapted to operate upon shoes having the lasting margin turned down away from the sole of the shoe, means for up-turning the lasting margin, said up-turning means including a plow which intermittently engages and turns up the lasting margin, means for gripping the lasting margin so turned up by the plow, said gripping means including a roller and a drive shaft for said roller, means for wiping the lasting margin in over the bottom surface of the sole, a hammer for intermittently impacting the wiped-in margin against the sole, a C-shaped bar pivoted intermediate its ends, said bar carrying the plow at one end and the hammer at the other end and having a nub thereon, and a disk fixed to said drive shaft, said disk having a nub which engages the nub on the bar to rock the bar on its pivot and thereby to cause the plow and hammer to act alternately upon the lasting margin.

10. In a machine of the class described adapted to operate on shoes having the lasting margin turned down away from the sole of the shoe, means for up-turning the lasting margin, said up-turning means including a plow which intermittently engages and turns up the lasting margin step by step progressively around the shoe, means for gripping the lasting margin so turned up by the plow, said gripping means including a roller and drive shaft on which said roller is mounted, means for wiping the lasting margin in over the bottom surface of the sole, a hammer for intermittently impacting the wiped-in margin against the sole, a bar pivoted intermediate its end and having one end normally below the other end, said bar carrying the plow at one end and the hammer at the other end, and means driven by said shaft for rocking the bar on its pivot.

11. In a machine of the class described adapted to operate upon shoes having the lasting margin turned down away from the sole of the shoe,

means for wiping the lasting margin in upon the bottom surface of the sole and securing it thereto, a plow for intermittently up-turning the lasting margin before it is wiped-in by said means, a hammer for intermittently impacting the wiped-in margin against the sole, and means for operating said plow and hammer alternately.

12. In a machine of the class described adapted to operate upon shoes having the lasting margin turned down away from the sole of the shoe, means for wiping the lasting margin in upon the bottom surface of the sole and securing it thereto, a plow for intermittently up-turning the lasting margin before it is wiped-in by said means, a hammer for intermittently impacting the wiped-in margin against the sole, a pivotally mounted member carrying the plow at one end and the hammer at the other end, and means for actuating said member to cause the plow and hammer to act alternately upon the margin.

13. In a machine of the class described adapted to operate upon shoes having the lasting margin turned down away from the sole of the shoe, means for wiping the lasting margin in upon the bottom surface of the sole and securing it thereto, a plow for intermittently up-turning the lasting margin before it is wiped-in by said means, a hammer for intermittently impacting the wiped-in margin against the sole, a pivotally mounted member carrying the plow at one end and the hammer at the other end, adjustable means for adjusting the relation of the plow to said member, and means for actuating said member to cause the plow and hammer to act alternately upon the margin.

14. In a machine of the class described adapted to operate upon shoes having the lasting margin turned down away from the sole of the shoe, means for wiping the lasting margin in upon the bottom surface of the sole and securing it thereto, a plow for intermittently up-turning the lasting margin before it is wiped-in by said means, a hammer for intermittently impacting the wiped-in margin against the sole, a pivotally mounted member carrying the plow at one end and the hammer at the other end, adjustable means for adjusting the relation of the hammer to said member, and means for actuating said member to cause the plow and hammer to act alternately upon the margin.

15. In a machine of the class described adapted to operate upon shoes having the lasting margin turned down away from the sole of the shoe, means for up-turning the lasting margin, said up-turning means including a plow which intermittently engages and turns up the lasting margin, means for gripping the lasting margin so turned up by the plow, gripping means including a roller and rotating means therefor, means for wiping the lasting margin in upon the bottom surface of the sole, a hammer for intermittently impacting the wiped-in margin against the sole, and means driven by said roller-rotating means for operating said plow and hammer alternately.

16. In a machine of the class described adapted to operate upon shoes having the lasting margin turned down away from the sole of the shoe, means for up-turning the lasting margin, said up-turning means including a plow which intermittently engages and turns up the lasting margin, means for gripping the lasting margin so turned up by the plow, said gripping means including a roller and rotating means therefor, means for wiping the lasting margin in over the bottom surface of the sole and securing it thereto, a

hammer for intermittently impacting the wiped-in margin against the sole, a pivotally mounted rocker member carrying the plow at one end and the hammer at the other end, and means driven by the roller-rotating means for rocking said member, thereby to cause the plow and hammer to act alternately upon the margin.

17. In a machine of the class described, a pair of opposed rolls between which a portion of the shoe upper is gripped while it is subjected to up-drawing stress, means for driving at least one of said rolls, and means operative to supply adhesive to the peripheral surface of one of said rolls, said means including a central duct and an orifice in which said latter roll is mounted.

18. In a machine of the class described, a pair of work-gripping rolls arranged to turn about axes which converge, one of said rolls having a rough work-engaging surface, means for driving the latter roll, and means for supplying adhesive to the peripheral surface of the other roll, said means supporting the axis of the latter roll and having a central duct and an orifice in which said latter roll is mounted.

19. In a machine of the class described, a work-gripping roll of truncated conical form having a rough peripheral surface, means for driving said roll, a second work-gripping roll cooperable with the first to grip the work between them, a pivoted support for said second roll constructed and arranged to support the latter roll for movement bodily toward and away from the first roll, means for moving the second roll toward the first, and means for delivering a supply of adhesive to the peripheral surface of the second roll comprising a duct in said pivoted support and an orifice in which said second roll is mounted.

20. In a machine of the class described, a pair of rolls for gripping a shoe upper while up-drawing stress is applied to the latter, means for supplying adhesive to the peripheral surface of one of said rolls, means for turning the other roll, intermittently moving lifting means operative to initiate up-draw of the shoe upper material, a wiper for wiping the up-drawn upper material inwardly over a sole member, and means for impacting the wiped-in upper material.

21. That method of lasting a force-lasted shoe having a platform which comprises drawing the lasting margin of the upper snugly over the edge wall of the platform, concomitantly applying adhesive to the inner surface of the lasting margin and the edge wall of the platform, and wiping said lasting margin about the edge wall and onto the bottom surface of the platform.

22. That method of lasting shoes which comprises up-drawing the lasting margin of the upper and concomitantly applying adhesive to the inner surface of the lasting margin and to the edge wall of the shoe sole.

23. That method of lasting shoes which comprises up-turning the lasting margin of the upper, drawing the lasting margin of the upper snugly over the edge wall of the sole member, concomitantly applying adhesive to the inner surface of the lasting margin and to the edge wall of the sole member, and wiping said lasting margin into contact with the edge wall and bottom surface of the sole member.

24. That method of lasting shoes which comprises up-drawing the lasting margin of the upper and concomitantly applying adhesive to the inner surface of the lasting margin and to the edge wall of the shoe sole, which adhesive has the property of instantaneous setting, and immedi-

ately thereafter wiping said lasting margin into contact with the edge wall and bottom surface of the sole.

25. In a machine of the class described adapted to operate upon shoes having the lasting margin turned down away from the sole of the shoe, means for wiping the lasting margin in upon the bottom surface of the sole and securing it thereto, a plow for intermittently up-turning successive portions of the lasting margin before it is engaged by said wiping means, a hammer for intermittently impacting the wiped-in margin against the sole, and means for operating said plow and hammer alternately.

26. In a machine of the class described adapted to operate upon shoes having the lasting margin turned down away from the sole of the shoe, means for up-turning the lasting margin, said up-turning means including a plow which intermittently engages and turns up successive portions of the lasting margin, means for gripping the up-turned lasting margin and for advancing the shoe, said gripping and advancing means including a roller and a driven shaft on which said roller is mounted, means for wiping the lasting margin in over the bottom surface of the sole and securing it thereto, a hammer for intermittently impacting the wiped-in margin against the sole, and means actuated by said shaft for operating said plow and hammer alternately.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
982,140	Keighley	Jan. 17, 1911
1,476,047	Buckminster	Dec. 4, 1923
2,028,831	Hadaway	Jan. 28, 1936
2,097,573	Newhall	Nov. 2, 1937
2,173,176	Matheu	Sept. 19, 1939
2,251,284	Kamborian	Aug. 5, 1941
2,292,558	Bell	Aug. 11, 1942

FOREIGN PATENTS

Number	Country	Date
450,697	France	Nov. 18, 1912