July 21, 1942. R. R. CAMPBELL 2,290,312

INSOLE MARGIN CEMENTING MACHINE

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Fig. 1.

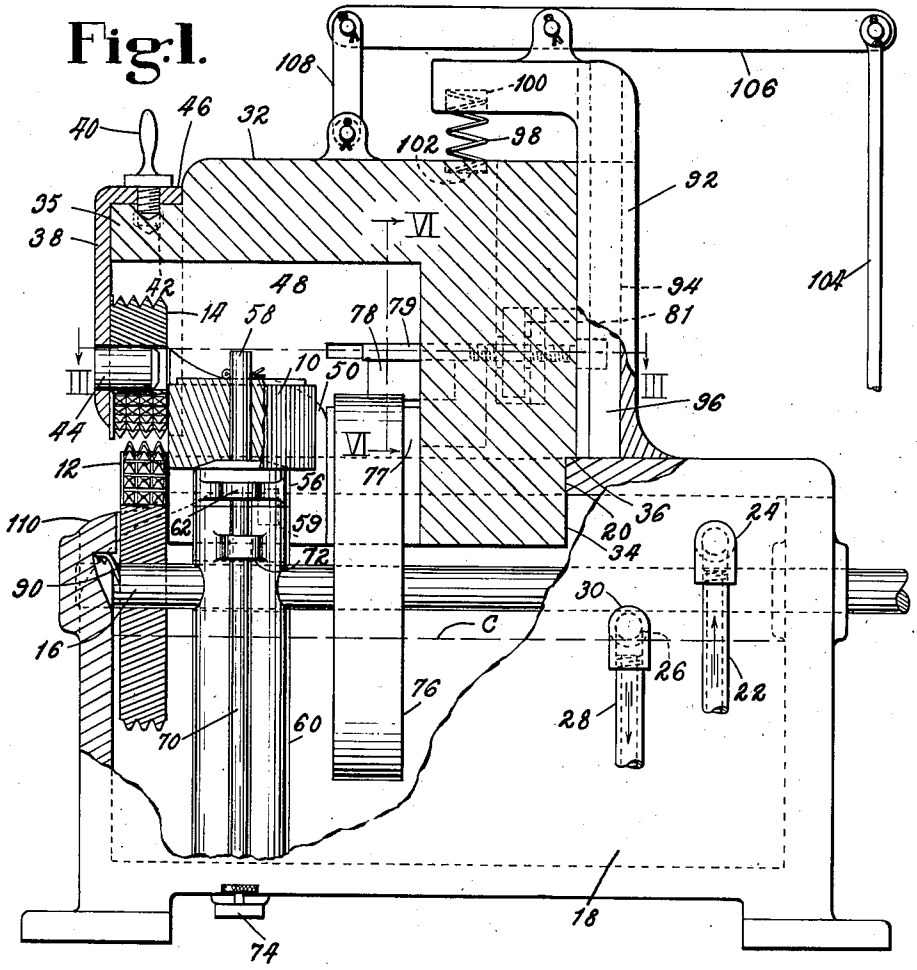


Fig. 3.

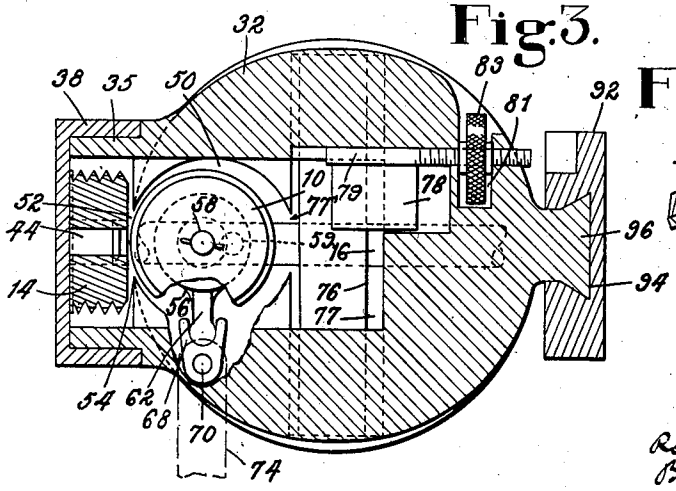
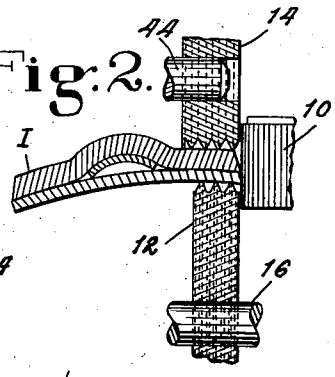


Fig. 2.



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Fig. 4

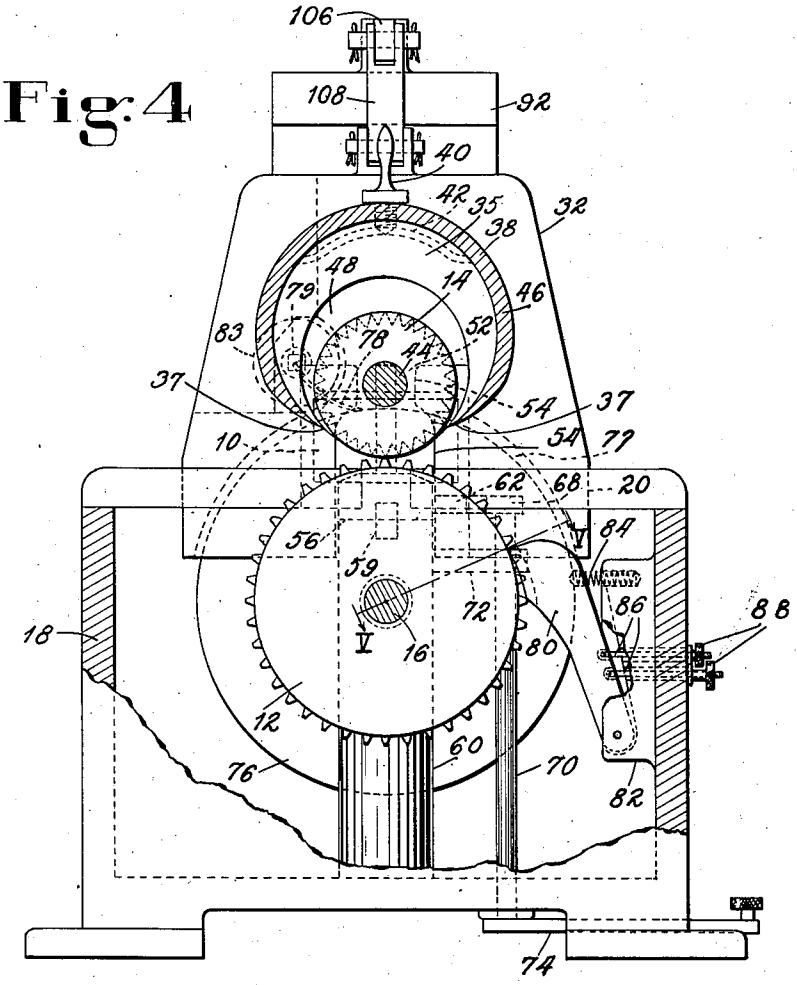


Fig. 5.

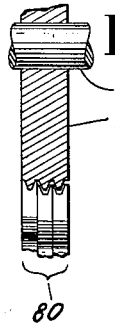
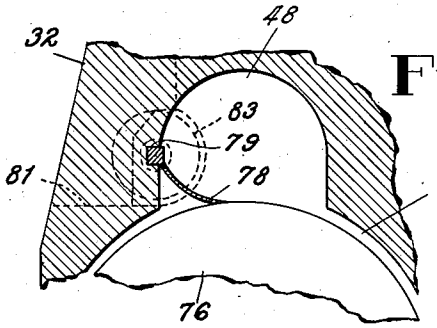


Fig. 6.



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INSOLE MARGIN CEMENTING MACHINE

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Application December 6, 1939, Serial No. 307,846

17 Claims. (Cl. 91—49)

This invention relates to a cementing machine and more particularly to a machine for applying cement to the edge portions of sheet material, such as unattached insoles, preparatory to applying edge binding thereto.

In the manufacture of footwear it is frequently desirable to apply binding tape to the edge of certain parts of shoes, particularly the insole. In order to produce a neat, smooth edge, particularly for platform insoles, the binding should be cemented along the edge of the insole as well along the top and bottom marginal portions thereof.

Heretofore, particularly in the application of cement to the edge of uppers and analogous parts of shoes, it has been customery to apply the cement to the marginal portions of the shoe part and to rely on a cement gage to carry the cement over onto the edge of the part or vice versa. This method of coating the edge of the shoe part may be reasonably satisfactory for thin material with skived edges but it is not positive enough to insure the application of a complete uniform coating of cement to the edge of an insole where the edge is of substantial thickness. There, a separate and independent source of supply for positively applying the cement to the edge of the sole as well as means for applying cement to the top and bottom marginal portions adjacent thereto is advantageous.

It is, therefore, an object of this invention to provide an improved machine adapted to apply cement to the edge of an insole or other sheet material and to the top and bottom marginal portions adjacent thereto.

In accordance with the aforesaid object it is a feature of the present invention to provide a machine in which the marginal portion of the sole is gripped between a pair of rolls and held with its edge in engagement with another roll, the axes of the rolls lying in a common plane, and in which means are provided to supply each of said rolls with cement so that a coating is applied to the opposite marginal portions of the sole and the edge adjacent thereto.

Another feature of the invention resides in a novel arrangement for controlling the relation between a scraper and one of the cement rolls whereby the quantity of the cement on the roll may be governed. As illustrated, an adjustable eccentric is provided to support the roll for adjustment relative to the scraper whereby just the desired portion of excess cement is removed from the roll by the scraper.

In the present invention the lower margin applying roll dips in the primary cement receptacle while the upper roll and the edge roll are housed in a secondary cement receptacle to which cement is supplied from the primary receptacle. Further novelty resides in means for supplying the secondary receptacle with cement, the aforesaid means being arranged to engage the peripheral surface of a pick-up disk, a portion of which dips in the primary reservoir, whereby the cement is stripped from the surface of the pick-up disk and directed into the secondary reservoir.

Frequently it is desirable to have the binding tape overlap the marginal portion of one surface of a sole more than the other and, therefore, another feature of the invention consists in a marginal cement applying roll having a plurality of peripheral rows of teeth and in means arranged to strip the cement from one or more of the rows of teeth whereby a band of cement narrower than the face of the roll may be applied to one of the marginal portions of the sole.

These and other features of the invention will now be set forth in detail with reference to the accompanying drawings, in which:

Fig. 1 is a side elevation, partly broken away and partly in section;

Fig. 2 is a fragmentary section showing the position of the top, bottom, and edge rolls with respect to the shank portion of a uni-shank insole;

Fig. 3 is a horizontal section through the head on the line III—III of Fig. 1;

Fig. 4 is a front elevation of the machine, broken away in part:

Fig. 5 is a detail taken on the line V—V of Fig. 4 showing the strippers for the lower roll; and

Fig. 6 is a vertical section on the line VI—VI of Fig. 1 showing the scraper for the pick-up disk.

Referring to Fig. 1, the machine comprises in general a plurality of cement applying rolls 10, 12 and 14 arranged to engage, respectively, the edge of an insole I and the bottom and top margins adjacent thereto, as illustrated in Fig. 2.

The bottom margin roll 12 has a toothed surface for the retention of cement and is mounted for rotation on a shaft 16 journaled in the end walls of a cement receptacle 18, the top part of the roll 12 projecting through an opening 20 in the top of the receptacle. The receptacle is supplied with cement from a pump (not shown) through a pipe 22 connected thereto by a coupling 24 and the level of the cement is maintained constant, so that the roll 12 always extends approximately

the same depth below the surface of the cement, by an overflow opening 26 to which is attached a return pipe 28 by a coupling 30.

The top margin roll 14 is also toothed and is mounted above the roll 12 for limited movement to and from the same whereby the distance between the surfaces of the rolls may be varied to accommodate substantially any thickness of work. To this end a head 32 is mounted for vertical sliding movement in the opening 20 in the top of the receptacle. The head 32 is circular in cross section, as shown in Fig. 3, the lower end of the head being reduced at 34 to provide a tight sliding fit in the opening 20 thereby forming a closure for the open side of the receptacle which prevents access of air to the cement in the receptacle 18 and also providing a shoulder 36 which limits the downward movement of the head by contact with the top of the receptacle 18.

The head 32 is substantially frusto-conical and a crescent-shaped boss 35 projects from its peripheral surface, the horns 37 of the crescent-shaped boss being directed downwardly, as shown in Fig. 4. A cap 38 is fitted over the open end of the boss and is adjustably secured thereto by a hand screw 40 so that it may be moved relative to the boss for a purpose to be hereinafter described. The screw is threaded through the cap at the top portion thereof and extends into a slot 42 formed in the upper convex surface of the boss so that by rotating the screw its end may be forced against the bottom of the slot to lock the cap on the boss. When the screw is slacked off, it will move freely along the slot, thereby permitting relative movement between the cap and the boss. A stud 44 is fixed to the cap and is arranged to rotatably support the roll 14, when the cap is in place, above the roll 12, the lower portion of the skirt 46 of the cap being cut away to permit the lower portion of the roll 14 to project below the boss. Rotation of the cap 38 on the boss 35 by means of the hand screw 40 will move the roll to or from one or the other of the horns 37, the horn at the right-hand side looking at the front of the machine, as illustrated in Fig. 4, serving as a doctor or stripping blade for the roll so that the quantity of cement on the surface of the roll may be governed in accordance with the work.

A chamber 48 defined by the concave surface of the boss 35 extends inwardly into the head 32 and forms a secondary cement reservoir which is filled with cement as will appear hereinafter, the cement therein enveloping the upper portion of the roll 14.

The edge roll 10 is provided with a striated surface and occupies a chamber 50 which is cylindrical in shape, the top of the chamber 50 opening into the chamber 48 and the wall of the chamber at one point intersecting the peripheral surface of the head so as to provide an opening 52 (Fig. 3) through which the peripheral surface of the edge roll 10 projects slightly so that the work contacting portion of its peripheral surface is substantially in tangential contact with the rear lateral faces of the rolls 12 and 14. This relation of the rolls provides an open-sided rectangular passage through which the edge of the sole may be moved for the application of cement to the edge of the sole and to the top and bottom marginal portions adjacent thereto. The cement in the chamber 48 flows over the top of the roll 10 and around its peripheral surface, the amount of cement presented by the roll to the edge of the sole being governed by a doctor blade or scraper 54, which in this instance is the right-hand edge, as shown in Fig. 3, formed by the intersection of the peripheral surface of the head 32 and the wall of the chamber 50, the roll 10 being movable to and from this edge by reason of an eccentric mounting. The eccentric 56 has fixed thereto a stud 58 upon which the roll 10 is removably mounted, the eccentric 56 being pivotally mounted on a stub shaft 59 projecting upwardly from a pedestal 60 so that the roll may be moved eccentrically with respect to its axis of rotation. The pedestal 60 is secured to the bottom of the cement receptacle and is provided with a horizontal aperture through which the shaft 16 loosely runs. A projection 62, extending from the eccentric 56, has an end which is rounded off and is arranged to cooperate with a yoke 68 secured to the top of a spindle 70 journaled near its top end in an eye 72 extending from the pedestal and at its lower end in an aperture in the bottom of the receptacle. A handle 74 is provided for rotating the spindle 70 and thereby the eccentric 56 which in turn moves the roll 10 to and from the edge 54 of the chamber 50 so as to control the thickness of the cement on the roll.

The cement is delivered to the chamber 48 and consequently to the rolls 10 and 14 by a pick-up disk 76 mounted for rotation with the shaft 16, the lower portion of the disk dipping in the cement and the upper portion projecting into a segmental chamber 77 which is formed in the under side of the head. The chamber 77 opens at its upper portion into the rear part of the chamber 48, and one wall of the chamber intersects the chamber 50 so as to form a connecting passage 77' (Fig. 3) between the two.

A scraper 78 having a surface which slopes upwardly in a curve toward the interior of the secondary reservoir (Fig. 6) is mounted adjacent to the peripheral surface of the disk 76 so as to scrape from the surface thereof the cement lifted from the receptacle 18 by the disk and direct it into the chamber 48. The scraper is so arranged that it may be moved laterally across the peripheral face of the disk to strip the cement from only a part of the surface with the result that the remaining cement is carried back into the cement receptacle, thereby providing means for regulating the quantity of cement delivered to the chamber 48. To this end the scraper 78 is mounted on a rod 79 shaped to fit a rectangular groove in the side of the chamber 48 and has a threaded portion slidable in the head 32 whereby the scraper may be moved laterally of the face of the pick-up disk 76. The scraper 78 is flexible and of sufficient length to remain in contact with the surface of the roll in spite of changes in the vertical position of the head 32 such as may result from variations in the thickness of the work or from lifting the head to permit insertion of the work. The threaded end of the rod 79 extends through a slot 81 in the wall of the head 32, the slot accommodating a thumb nut 83 which is threaded on the threaded portion of the rod and provides means for sliding the same to move the scraper laterally. The constant rotation of the disk 76 soon fills the chamber 48 with the result that cement will flow into the chamber 50 and over the top of the rolls 10 and 14, the excess cement flowing back into the receptacle between the lateral faces of the disk 76 and the walls of the chamber 77.

Generally the binding tape is lapped over

equally on the opposite sides of the insole. However, it may be desirable to lap the tape over on one surface more than the other and when such an occasion arises it is necessary to vary the widths of the bands of cement on opposite surfaces. To this end, the bottom roll is provided with a set of three scrapers arranged to engage its periphery, one scraper for each row of teeth thereon. The scrapers 80, as shown in Fig. 4, are pivotally mounted in a recessed web 82 extending inwardly from the wall of the receptacle. The scraping surfaces of the scrapers are complementary to the toothed surface of the roll, as shown in Fig. 5, and are yieldably held by means of springs 84 against the surface of the roll. Each scraper has secured thereto a rod 86 which extends through the wall of the receptacle and has a draw nut 88 by which the scrapers may be moved away from the surface of the roll against the action of a spring 84. By adjustment of the scrapers, a whole or a part of the roll may be scraped free of cement or the adjustment may be made so that different quantities of cement are carried by different portions of the width of the roll.

The front lateral face of the roll 12 is kept clean of cement by a scraper 90 (Fig. 1) fixed to the front wall of the receptacle in such a position that its edge engages the lateral face approximately on a horizonal radius, the scraper edge extending from the center of the roll to the periphery thereof.

Since the thicknesses of the various portions of an insole are not uniform, it is desirable to mount one of the rolls so that it will yield as the sole is passed between them. This has been accomplished by yieldably urging the slidable head 32 toward the work. For this purpose an inverted L-shaped member 92 is fixed to the top of the receptacle having therein a dovetailed slot 94 arranged to receive a dovetail 96 formed on the head thereby serving to guide the movement of the head. The short arm of the L-shaped member overhangs the top of the head and a compression spring 98 is disposed between the end of the short arm and the head so as yieldably to hold the head in its lowest position, the ends of the spring being seated in cups 100 and 102, respectively, formed in the arm and head. The head, however, may be raised so as to facilitate the introduction of work between the rolls by a treadle rod 104 which is connected by way of a lever 106 and a link 108 to the top of the head. The lever 106 is pivoted between its ends on the short arm of the L-shaped member 92, the opposite ends of the lever being connected, respectively, to the link 108 and the treadle rod 104.

In order to facilitate manipulation of the work, the front part of the receptacle 18 has been rounded off at 110 (Fig. 1) which permits free tilting of the work, such as a Unishank insole I (Fig. 2), about a horizontal axis. Movement of such an insole in a horizontal plane to gain access to the concave contours of the sole is provided for in the frusto-conical shape of the head 32.

In operation the shaft 16 is rotated by suitable means and the machine is permitted to run for a sufficient length of time for the disk 76 to fill the chamber 48 with cement. The strippers for the lower margin roll 12 are then adjusted so that the roll will apply a band of cement of the proper width and thickness to the lower side of the sole and the rolls 10 and 14 are adjusted on their eccentrics so that the proper thickness of cement is maintained on their surfaces. The position of the scraper for the disk 76 is then adjusted to regulate the quantity of cement delivered to the chambers. With these adjustments made the machine is ready for the introduction of work which the operator does by lifting the head sufficiently to permit the introduction of the work, for example, the edge of an insole I, to the open-sided channel formed by the co-operating surfaces of the cement applying rolls, as shown in Fig. 2, whereupon the work is guided by the operator to present a whole or part of its periphery to the cement-applying rolls.

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

1. In an insole margin cementing machine, a pair of rolls arranged to grip the opposite marginal portions of a sole, a roll disposed adjacent said rolls to engage the edge of the sole, the axes of said rolls all lying in the same plane, and means to supply cement to each of said rolls whereby cement is applied to the edge of the sole and the top and bottom marginal portions adjacent thereto.

2. In an insole margin cementing machine, a pair of opposed rolls arranged to grip the opposite marginal portions of a sole, a roll disposed adjacent to the rear lateral faces of said rolls with a portion of its peripheral surface at right angles to the work engaging portions of said opposed rolls and lying substantially in the plane of said rear lateral faces of said rolls at the bite thereof, means to supply cement to each of said rolls whereby cement is applied to the edge of the sole and to the top and bottom marginal portions adjacent thereto, and means to move one of the opposed rolls to and from the other.

3. In an insole margin cementing machine, a primary cement reservoir, a bottom margin applying roll dipping in said primary reservoir and arranged to deliver cement to the bottom marginal portion of an insole, a secondary cement reservoir, means arranged to supply cement from the primary to the secondary reservoir, and top margin and edge applying rolls arranged in the secondary reservoir to deliver cement from the secondary reservoir to the top marginal portion and edge of the insole.

4. In an insole margin cementing machine, a primary cement reservoir, a secondary reservoir connected with the primary reservoir, top margin and edge applying rolls arranged in the secondary reservoir, and means in the primary reservoir to deliver cement to the secondary reservoir in excess of that used, the connection between the secondary and primary reservoir permitting the excess cement to drain back into the primary reservoir.

5. In an insole margin cementing machine, a primary cement reservoir, a secondary reservoir connected with the primary reservoir, a rotatable pick-up disk dipping in the primary reservoir and having its upper portion extending into and moving through the secondary reservoir, and means in said secondary reservoir engaging the peripheral face of that portion of the pick-up disk passing through the secondary reservoir thereby to remove cement therefrom, said means having a curved surface for lifting the cement from the surface of the disk into the secondary reservoir.

6. In an insole margin cementing machine, a primary cement reservoir, a secondary reservoir connected with the primary reservoir, a pick-up disk dipping in the primary reservoir and hav-

ing its upper portion extending into and moving through the secondary reservoir, and a scraper in said secondary reservoir engaging that portion of the disk passing through the secondary reservoir so as to strip the cement from the disk, said scraper being curved upwardly from the surface of the disk toward the interior of the secondary reservoir thereby to lift the cement into the secondary reservoir.

7. In an insole margin cementing machine, a cement receptacle, a pick-up disk mounted in said receptacle, a stripper, means for mounting the stripper adjacent to the pick-up disk for movement to or from the same, said stripper being flexible and having an edge arranged to engage the top of the disk to strip cement therefrom, the length of said stripper being greater than the distance between said stripper-mounting means and the top of the disk whereby it will remain in contact with the disk within predetermined limits of movement of said stripper to and from the disk.

8. In an insole margin cementing machine, a primary cement reservoir, a secondary reservoir connected with the primary reservoir, a disk dipping in the primary reservoir and having its upper portion extending into and moving through the secondary reservoir, means in said secondary reservoir engaging the peripheral face of that portion of the disk passing through the secondary reservoir so as to remove cement therefrom, and means to adjust said last-named means transversely of the peripheral face so as to vary the quantity of cement delivered to the secondary reservoir.

9. In an insole margin cementing machine, a cement applying roll arranged to engage the edge of the sole, means for delivering cement to said roll, a scraper arranged to remove excess cement from the edge applying roll, said edge applying roll being mounted on an eccentric, and means to move said eccentric to vary the distance between the edge applying roll and the scraper.

10. In an insole margin cementing machine, a cement applying roll arranged to engage the edge of the sole, means for delivering cement to said roll, a scraper arranged to remove excess cement from the edge applying roll, an eccentric, means for mounting the edge applying roll on the eccentric, and means for moving said eccentric means to vary the distance between the edge applying roll and the scraper.

11. In an insole margin cementing machine, a plurality of cement applying rolls arranged to engage the edge and top and bottom marginal portions of the sole, means for delivering cement to said rolls, a scraper arranged to remove excess cement from the top margin applying roll, an eccentric, said top margin applying roll being mounted on the eccentric, and means to move the eccentric to vary the distance between the roll and the scraper.

12. In an insole margin cementing machine, a plurality of cement applying rolls arranged to engage the edge and top and bottom marginal portions of the sole, means for delivering cement to said rolls, scrapers arranged to remove excess cement from the edge and top margin applying rolls, and eccentrics upon which said edge and top margin applying rolls are mounted whereby the distance between the said rolls and their respective scrapers may be varied to control the quantity of cement.

13. In an insole margin cementing machine, a cement receptacle having an opening in the top, a cement applying roll mounted upon a horizontal axis journaled in said receptacle, a cement applying roll mounted on a horizontal axis above the last-named cement applying roll, a cement applying roll mounted on a vertical axis with its peripheral surface substantially in the plane of the rear lateral faces of the horizontally mounted rolls, and means for supplying cement to said rolls.

14. In an insole margin cementing machine, a cement receptacle having an open side, a plurality of cement applying rolls mounted in said receptacle having surfaces arranged to engage the edge and bottom marginal portions of the sole, a head slidably mounted in the open side of the receptacle, a top margin applying roll mounted in said head above the bottom margin roll, said head forming a closure for the open side of the receptacle and enclosing said rolls except for the work engaging portions thereof, and means for holding the head in its lowermost position so that the sole will be gripped between the top and bottom margin rolls, said means being yieldable so that the top roll will yield to accommodate variations in the thickness of the sole.

15. In an insole cementing machine, a cement receptacle having an opening, a slidable head, a crescent-shaped boss on said head, a chamber in the boss extending into the head, a cavity in the lower wall of the chamber, a forward portion of which intersects the surface of the head, a recess extending from the bottom of the head upwardly and opening into the chamber at the top and into the cavity at one side, a cement roll mounted in said boss, a cement roll mounted in said cavity, and a pick-up disk mounted in the cement receptacle with its upper portion extending into the recess whereby cement is lifted from said receptacle to fill said chamber, thereby submerging the roll mounted in the boss and the roll mounted in the cavity in cement.

16. A machine for applying cement progressively around the periphery of an insole both to the peripheral edge thereof and to relatively narrow portions on opposed top and bottom faces of the insole adjacent to the peripheral edge comprising a cement receptacle, a driven cement applying roll a portion of which dips in the receptacle and a portion of which is arranged to engage a marginal portion of one face of the insole, and two non-driven freely rotatable cement applying rolls remote from the receptacle, a portion of one of the last mentioned rolls being arranged to engage the peripheral edge and a portion of the other roll being arranged to engage the opposite marginal portion of the insole, each of said rolls having a cement applying face of less width than that of the insole.

17. In an insole margin cementing machine, a cement receptacle, a bottom margin applying roll dipping in said receptacle, a top margin applying roll and an edge applying roll positioned with respect to said bottom margin applying roll to form an open-sided rectangular passage, the cement applying surfaces of said rolls each having a width less than the width of the insole to be coated whereby the peripheral edge of the insole and only the top and bottom marginal portions adjacent thereto are coated with cement, and means for transferring cement from the receptacle to the top margin and edge applying rolls.

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