April 24, 1934. J. W. COSGROVE 1,955,872

SHOE UPPER CEMENTING MACHINE

Filed Jan. 16, 1929 2 Sheets-Sheet 1

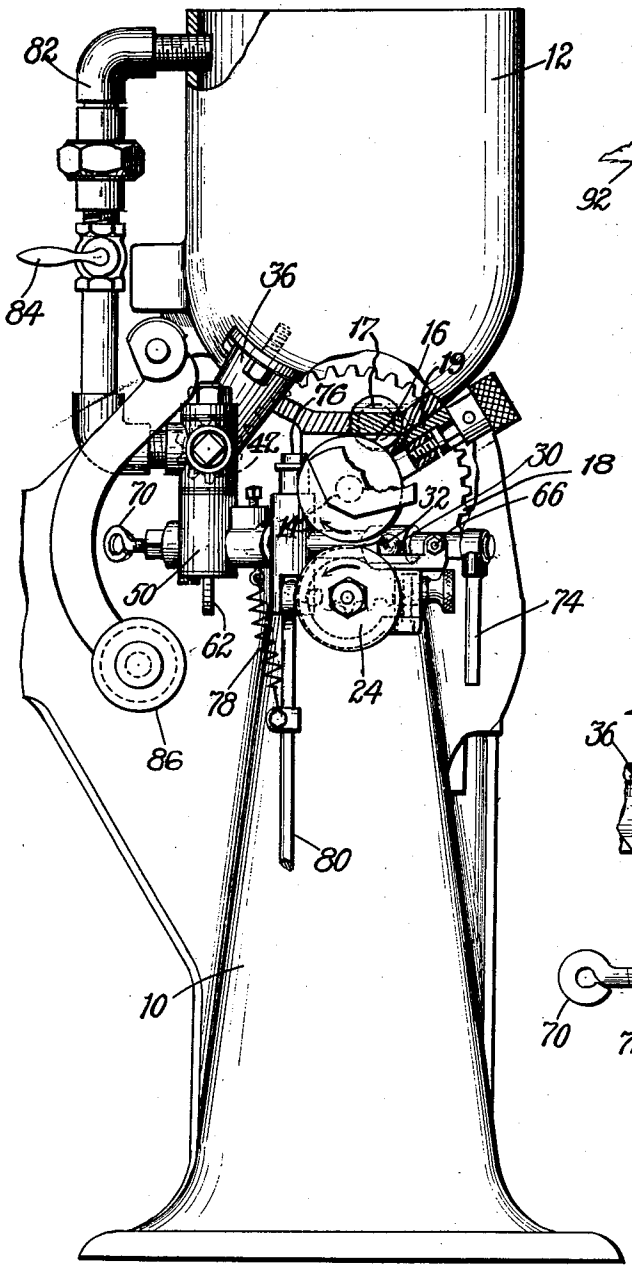

Fig. 1.

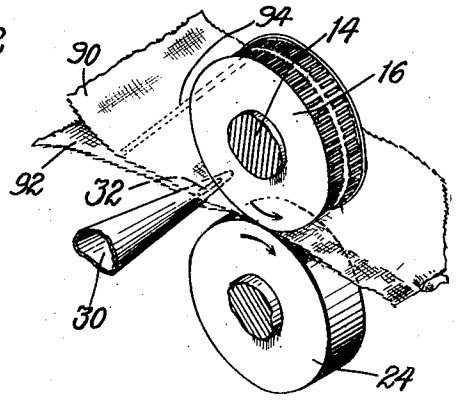

Fig. 2.

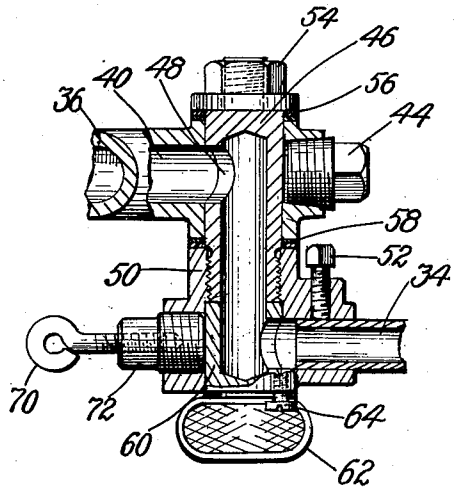

Fig. 3.

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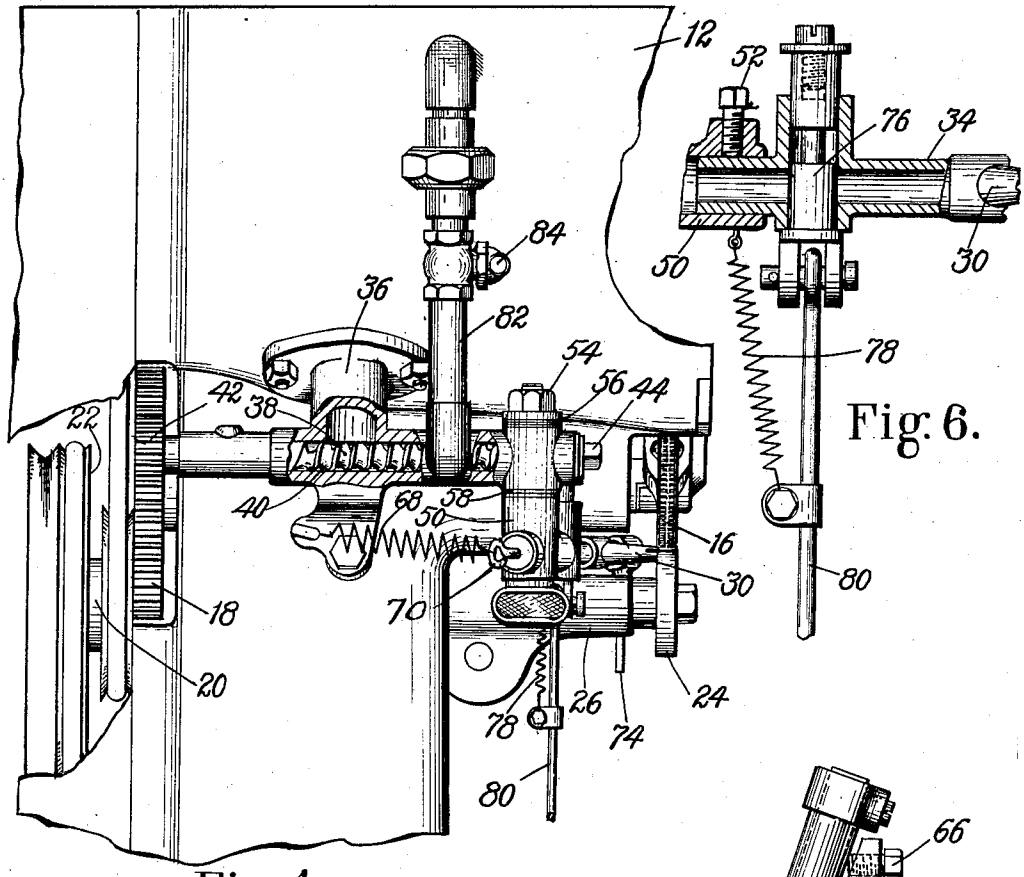

Fig. 6.

Fig. 4.

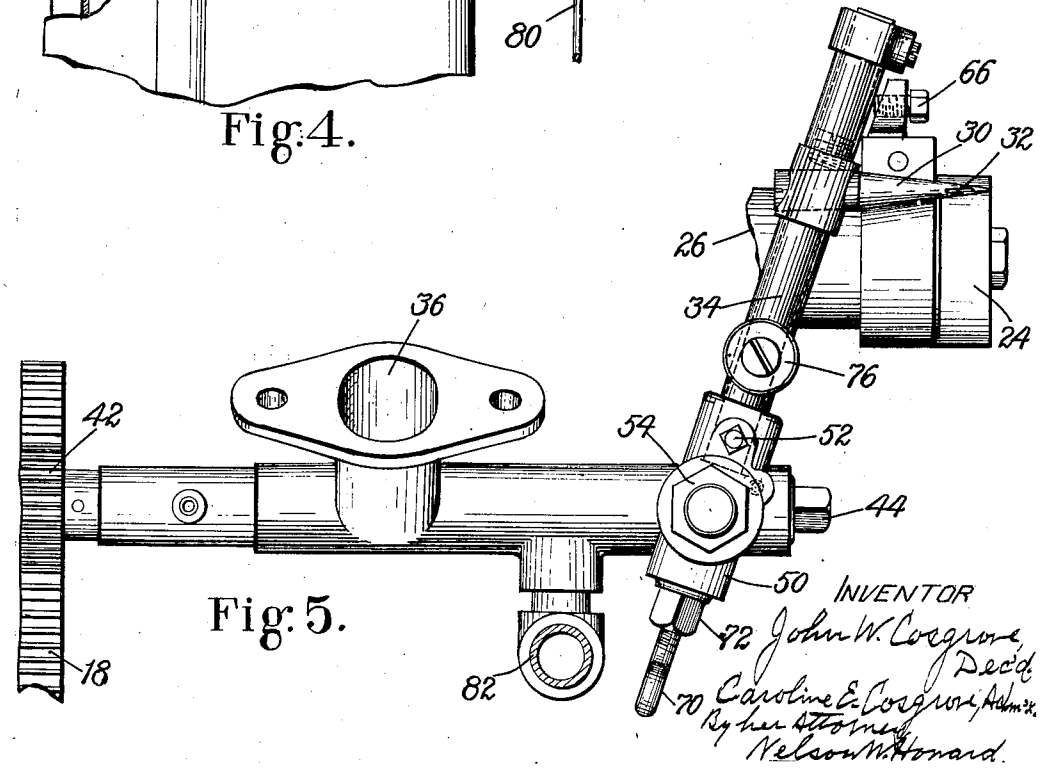

Fig. 5.

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1,955,872

SHOE UPPER CEMENTING MACHINE

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Application January 16, 1929, Serial No. 332,904

11 Claims. (Cl. 154—1)

This invention relates to coating machines and is herein illustrated as embodied in a machine for cementing shoe uppers.

The uppers or tops of rubber-soled tennis shoes are not sewed to the insoles as is the usual practice in connection with the manufacture of leather shoes, but are secured to the insoles by cement. Customarily, a stripe of cement is applied for this purpose to the lower inner margin of the completed upper by turning it inside out and passing it through a top cementing machine such as that shown in Letters Patent of the United States No. 1,380,360 granted June 7, 1921 upon the application of J. W. Cosgrove. If, however, the upper is provided with a lining, then it is necessary to apply this stripe of cement to the lining after it has been assembled with the upper to hold the lining to the insole. In accordance with the best practice, the lining and the upper are also secured together at their lower edge, in some fashion, aside from the usual stitching at the upper edge of the upper, in order to maintain the correct relation between the upper and the lining during the lasting operation. It is the practice in some cases to apply a coating to the upper before the attachment of the lining and, after this has become sufficiently dry, to sew the lining into the upper near the top edge and then to coat the lower margin of the lining so that both portions of the upper are perfectly retained and secured to the insole in lasting. The procedure in any case is troublesome and costly.

Accordingly, an important object of this invention is to provide an improved machine by means of which cement may be applied to superposed layers of material, such as the parts of a lined shoe upper, which have been stitched together along one edge, applying a coating of cement not only to the outer surface of one of the layers but also between the superposed layers.

In accordance with features of the invention, the illustrated machine is provided with a tapered nozzle, having a slit-like opening, which may be inserted between the superposed layers of a lined upper and is located at a point just preceding the bite of the rolls of a top cementing machine such as is illustrated in the aforementioned patent. By this organization a stripe of cement may be applied between the superposed layers in addition to the coating normally applied by the cement roll of the machine upon the outside surface of one of said layers and the two layers pressed firmly together. As illustrated, mechanism in the form of a driven screw is provided for positively forcing the cement through the opening of the nozzle, and operator-controlled means in the form of a treadle-operated valve is provided so that the flow of cement through the nozzle may be interrupted and diverted through a suitable by-pass. In order to facilitate the positioning of the outlet of the nozzle with respect to the applying roll of the machine, the nozzle is preferably mounted upon a swinging arm and a stop screw is arranged adjustably to control the position of said arm when operatively related to the rolls of the machine. A spring is arranged to hold the nozzle against the top screw and a handle is provided upon the nozzle so that the operator may move it aside if desired in order to facilitate the passage of work through the machine.

The invention provides also, as a further feature, a novel organization by means of which controlled quantities of cement may be delivered to the opening of a delivery nozzle for removal by pieces of work manually presented to the nozzle and laid upon or dragged over said opening.

Another feature of the invention resides in the provision, in a machine having a nozzle for applying cement to work and work feeding means including a displaceable element, of operator-controlled means for substantially simultaneously bringing the displaceable element into coacting relation to the work and opening a valve to permit the delivery of cement through the nozzle. As herein illustrated, the displaceable element is the lower of two work gripping and feeding rolls.

These and other features of the machine will be described in the following specification, reference being had to the accompanying drawings, in which

Fig. 1 is an end elevation of the machine;

Fig. 2 is a diagrammatic view showing in perspective the applying devices together with a piece of work;

Fig. 3 is a vertical section through the pivotal joint of the applying nozzle;

Fig. 4 is a side elevation, with parts in section, taken from the rear of the machine;

Fig. 5 is a plan view of the applying nozzle and associated parts detached from the rest of the machine; and

Fig. 6 is a detail in section of the operator-controlled valve.

The machine, which is in general like that shown in the above-mentioned Patent No. 1,380,360, to which reference may be had for a description of the parts not herein shown or de-

scribed, comprises a frame 10 supporting a cement receptacle 12 and providing bearings for a shaft 14 on which are mounted an applying roll 16 and a gear 18 by means of which the shaft 14 is connected to a drive shaft 20 (Fig. 4) provided with fast and loose pulleys 22. The flow of cement from the receptacle 12 to the applying roll 16 is controlled by means of a manually operated valve 17 operating in a passageway between the receptacle 12 and the applying roll 16 in the same manner as in the machine disclosed in the Letters Patent referred to above. The applying face of the roll 16 is provided with a series of depressions more effectively to convey the cement to the work, and cooperating with the downwardly traveling portion of the applying face there is provided an adjustable fluid controlling scraper 19 which may be adjusted toward and away from the applying face of the roll to control the amount of fluid applied to the work. The machine is also provided with a work supporting feed roll 24 mounted on a driven shaft and carried in a pivoted bracket 26 which is adapted to be raised to hold a piece of work in contact with the applying roll 16 and to co-act with the latter in feeding the work through the machine. An operator-controlled treadle, not shown, such as is employed in the machine of the above-mentioned patent is provided for lifting the feed roll 24 when desired to bring the displaceable work-feeding element into coacting relation with the work and the upper feed roll 16 so that the work is gripped between said rolls 16 and 24 and is drawn past a cement-applying nozzle 30, to be described.

The machine is also provided with a tapered nozzle 30 having an outlet opening slit 32 located just in advance of the bite of the co-acting rolls 16 and 24 and arranged to be inserted between superposed layers of material to apply a coating of cement to an inner surface of one of said layers just prior to the passage of the material between the rolls of the machine. Obviously, the pressure of the co-acting rolls of the machine upon the superposed layers of material will tend to press them into engagement with each other and to spread out and imbed in the work the coating of cement applied between the superposed layers. It will be observed that the opening slit 32 in the nozzle 30 is not positioned at the top of the nozzle but at one side thereof as shown in Fig. 1 so that the cement is delivered in a direction tending to carry it away from the nozzle during the progress of the work, thus helping to keep the nozzle clean. The nozzle 30 is mounted upon a swingingly mounted hollow arm 34 or conduit to which cement is supplied from the receptacle 12 through an outlet casting 36 bolted to the side of the receptacle 12. As herein illustrated a screw 38 is positioned in a horizontal passage 40 of said outlet 36 and is connected by a gear 42 to the gear 18 upon the shaft of the applying roll. Thus, even though the cement is of a viscous character, it will be positively forced out through the nozzle opening 32 on one of the superposed layers.

The pivotal connection between the swinging arm 34 and the outlet casting 36 is shown in detail in Fig. 3 from which it will be seen that the outer end of the horizontal passage 40 is closed by a plug 44 and that a vertical passage is drilled through this outer end for the reception of a hollow swing fitting 46 having a lateral opening 48 which communicates with the passage 40 in all usual positions of said fitting. This swing fitting 46 is threaded at its lower end for engagement with a casing 50 which supports the hollow swinging arm 34 and the latter is held in said casing by means of a set screw 52. The fitting 46 by means of which the casing 50 is pivotally supported on the casting 36 is held tightly but pivotally therein by means of a nut 54 threaded on the upper end of said fitting, suitable washers 56 being interposed between said nut and the upper surface of the outlet casting 36 and other washers 58 being interposed between the joint formed at the lower surface of the outlet casting 36 and the casing 50. A clean-out plug 60 having a handle 62 is mounted in the casing 50 at the joint between the passage through the fitting 46 and the passage through the hollow arm 34. This plug is held in the casing by means of a screw 64. The swinging arm 34 which carries the nozzle 30 is normally held against an adjustable stop screw 66 carried in an extension of the feed-roll bracket 26 by a spring 68 (Fig. 4) attached to a fixed part of the machine at one end and at its other end to a screw eye 70 secured in a plug 72 which is mounted in the casing 50. The arrangement is such, therefore, that the position of the outlet slit 32 in the nozzle 30 may be adjustably determined with respect to the rolls 16 and 24 of the machine laterally of the path of movement of the work by adjusting the stop screw 66. At the same time, the nozzle may readily be moved aside, if desired, to facilitate the passage of work through the machine, and to this end a depending handle 74 is mounted at the outer end of the swinging arm 34 to enable the operator to push that arm aside against the tension of the spring 68.

Inasmuch as the speed of operation of the machine is such that it would be practically impossible for the operator to provide a continuous progression of pieces of work through the machine without any interruption, it becomes desirable to be able to control the flow of cement through the nozzle so that the feed roll 24 will not become coated with cement during the interval between the departure of one piece of work and the presentation of the next piece of work. Accordingly, the hollow arm 34 is provided with a vertical reciprocating piston valve 76 (Fig. 6) normally held in closed position by means of a spring 78 attached to a depending operating rod 80 but arranged to be opened when desired by depression of the rod 80 which may be connected to the usual treadle rod of the machine. Since the machine is driven continuously during its period of use the continuously rotating screw 38 might produce undue pressure if the valve 76 is left in closed position for any length of time. Accordingly a by-pass pipe 82 is connected to the passage 40, which by-pass leads back to the tank 12 as shown in Fig. 1. A valve 84 is provided in the by-pass which may be manually operated when desired or may be connected to the operating rod 80 of the valve 76 so as to open the valve 84 when the valve 76 is closed. As is usual with this machine, a cleaning roll 86 mounted on a swinging bracket at the rear of the machine is provided and arranged to be brought into engagement with the feed roll 24 when it is necessary to clean bits of adhering cement from the latter.

In the operation of the machine, which will be described in connection with its use for cementing the lined uppers of tennis shoes, the superposed layers of material will be threaded over the nozzle 30, as shown in Fig. 2, and between

the rolls 16 and 24. The operator will then depress the treadle of the machine, lifting the roll 24 into co-acting relation with the roll 16 and at the same time opening the valve 76 so that cement will be supplied through the opening slit 32 of the nozzle and the work drawn past the nozzle by the coacting feed rolls 16 and 24. The exact position of the opening slit of the nozzle will have been previously determined by adjustment of the stop screw 66. In the usual construction of canvas tennis shoes, the lining and the upper or top are stitched together not only at the top edges of the upper but also at points such as the back seam and at the side seams where the vamp is joined to the quarters. In the use of the machine, therefore, the upper will be turned inside out and presented to the machine with the lining 90 (Fig. 2) uppermost and the canvas upper 92 below the nozzle 30. The usual practice is to thread the work over the nozzle just to the rear of one of these seams and then to guide it through the machine applying a coating around the edge of the upper until it meets the succeeding seam indicated at 94. The operator then by manipulation of the handle 74 can draw the nozzle to one side in order to pass the seam and to allow it to come back, after the seam is passed, into position between the lining and the upper. Continuing this mode of operation the operator will guide the work to apply a coating around the lower margin of the shoe upper and of the lining.

Having thus described the invention, what is claimed as new and desired to secure by Letters Patent of the United States is:

1. In a machine for applying cement to shoe parts, a horizontally disposed outlet nozzle having a restricted delivery opening near its upper surface whereby work dragged across the top of the nozzle will remove cement exuding from the restricted opening, a cement container, positive pressure means for supplying cement from said container to said nozzle, and an operator-controlled valve between said pressure means and said nozzle to control the flow of cement therebetween.

2. In a machine for applying cement to shoe parts, a cement reservoir having an outlet passage, positive pressure producing means in said outlet passage for forcing cement therethrough, a by-pass connected to said outlet passage and to the reservoir, an operator-controlled valve in the passage, and a horizontally disposed delivery nozzle fed from said outlet passage having a restricted opening adjacent to its upper surface whereby cement may be forced upwardly through said restricted opening and removed by applying the shoe part to said delivery nozzle.

3. In a machine for applying cement to boot and shoe parts, a delivery nozzle having a restricted opening adjacent to its uppermost surface so that a piece of work may be dragged across the top of the nozzle to remove cement exuding from the restricted opening, and means for forcing cement through said opening at the will of the operator comprising a continuously operated force feed mechanism, and operator-controlled mechanism constructed and arranged to allow either the delivery of cement to the nozzle or its return to the receptacle.

4. A machine for applying cement to shoe parts having a plurality of superposed layers of material of the type in which a stripe of cement is applied to an outer surface of said layers and the work is gripped and fed by means of coacting rolls, for one of which there is a controllable supply of cement, having, in combination, a cement-applying device constructed and arranged for insertion between the edges of the superposed layers in front of the rolls, thereby to apply a band of cement to the inner surface of one of said layers which will be squeezed into the material by the rolls, a reservoir for cement directly connected to said cement-applying device, and means for controlling the quantity of cement supplied from said reservoir to said device independently of the control for the roll supply.

5. In a machine for applying cement to an outer and an inner surface of superposed layers of material for shoe parts wherein the application of cement to the outer surface is effected by means of one of two coacting superposed feed rolls, the combination of mechanism for applying a band of cement to an inner surface of said layers prior to their passage between said rolls comprising a nozzle having a restricted opening and arranged for insertion between said layers, means for supplying cement to said nozzle, and operator-controlled means for regulating the flow of cement through said nozzle.

6. In a machine for applying cement to an outer and an inner surface of superposed layers of material for shoe parts wherein the application of cement to the outer surface is effected by means of one of two coacting superposed feed rolls, the combination of a nozzle having a restricted opening and arranged for insertion between said layers to apply a band of cement to an inner surface thereof prior to their passage between the rolls, operator-controlled means individual to said nozzle for controlling the flow of cement therethrough, and means for swingingly supporting the nozzle to allow its lateral displacement at the will of the operator, thus facilitating the introduction of work into the machine.

7. That improvement in machines for applying a band of cement to an inner surface of superposed layers of shoe parts, substantially at the same time that the band of cement is applied to an outer surface thereof by means of an applying mechanism which serves also to squeeze together and to feed the superposed layers, which comprises the combination of a nozzle for insertion between the layers, said nozzle having a restricted opening upon its upper side whereby the layer dragged across the top of the nozzle will remove cement exuding from the restricted opening, a receptacle for supplying cement to said nozzle, a force feed mechanism for delivering cement through said opening, and operator-controlled valve and by-pass mechanism constructed and arranged to allow the cement to pass through said nozzle or to be returned to the reservoir.

8. In a machine for applying cement to shoe parts, of the type having a cement reservoir, a valve-controlled nozzle supplied by said reservoir for applying cement to a shoe part passed through the machine, and work feeding means including a displaceable work contacting feed element, characterized by the provision of operator-controlled means for substantially simultaneously bringing said displaceable element into coacting relation to the work and opening said valve to permit the delivery of cement through the nozzle.

9. In a machine for applying cement to shoe parts, a cement reservoir, a nozzle connected to said reservoir and having a delivery opening for applying a stripe of cement to shoe parts drawn past the nozzle, a valve interposed between said reservoir and said nozzle, work feeding means in-

cluding coacting rolls one of which is bodily displaceable to facilitate the insertion of work, and operator-controlled means for substantially simultaneously opening said valve and bringing said displaceable roll into coacting relation to the work whereby feed movement of the work will be started when the flow of cement through the nozzle starts.

10. In a machine for applying cement to shoe parts, a receptable for cement, a delivery nozzle, means for forcing cement from said reservoir through said nozzle including an operator-controlled valve, work-feeding rolls the lower of which is journaled in a pivoted bracket so that it may be lowered to facilitate the insertion of work or raised to coact with the upper roll in feeding the work, and operator-controlled means for substantially simultaneously lowering the feed roll and closing the valve, thereby avoiding the delivery of cement after the feed is stopped.

11. A machine for applying cement to shoe parts made up of plural layers of material comprising a cement receptacle provided with a delivery opening, a rotatable applying roll receiving cement from said opening, means for controlling the cement on said roll, a work-supporting roll cooperating with the applying roll, a conduit leading from the receptacle and terminating in a nozzle arranged to deliver a body of cement between the layers of material at the incoming side of the rolls, means for rotating the rolls to advance the work, apply cement from the receptacle to the exterior of a layer of the material and distribute and work into the material the cement delivered by the nozzle between the layers, and means for controlling the quantity of cement supplied from said receptacle to said nozzle independently of the control for the roll supply.

CAROLINE E. COSGROVE,
Administratrix of the Estate of John W. Cosgrove, Deceased.