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2,097,573

CHANNEL CEMENTING MACHINE

Original Filed Sept. 28, 1935 5 Sheets-Sheet 1

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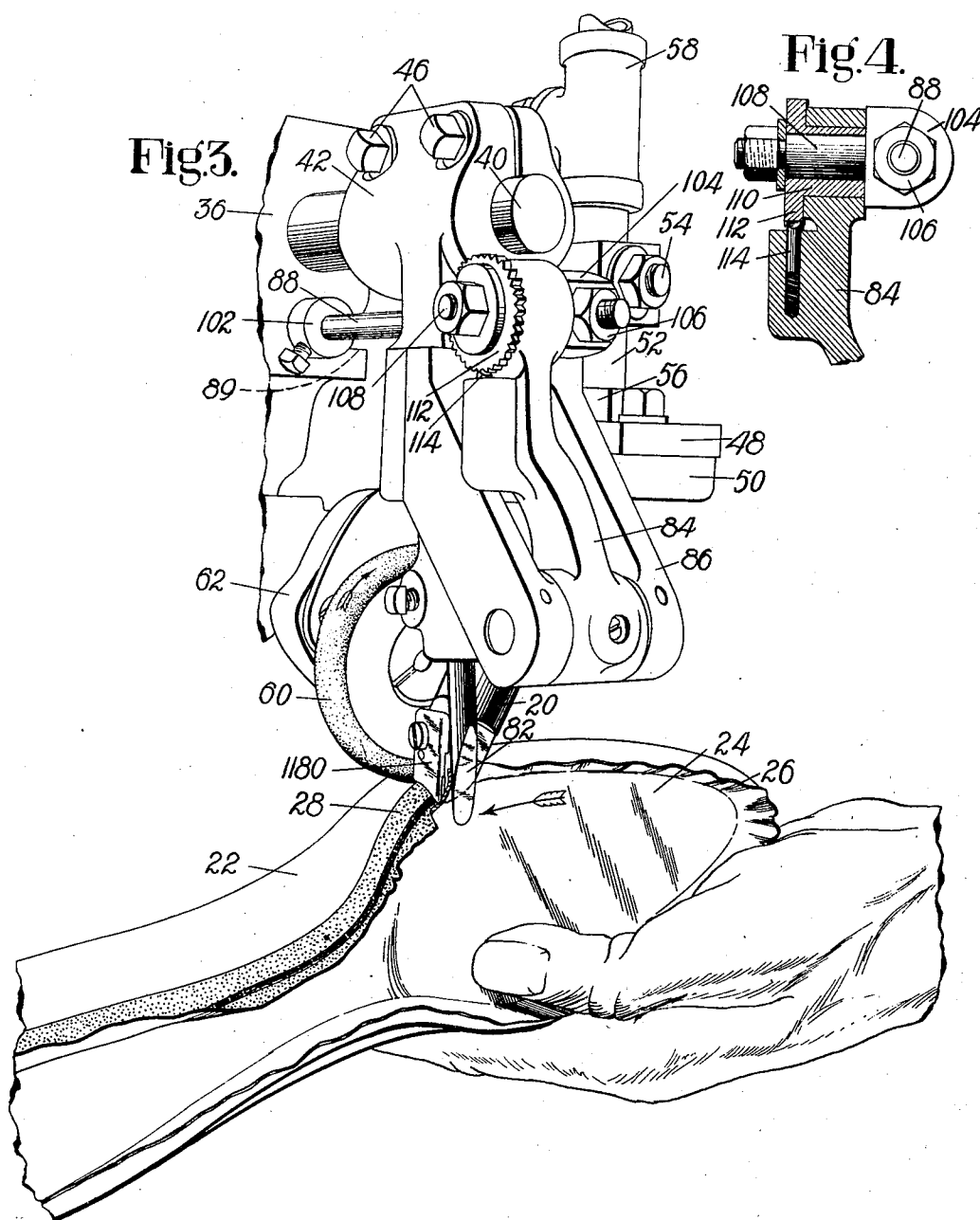
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CHANNEL CEMENTING MACHINE

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5 Sheets-Sheet 2



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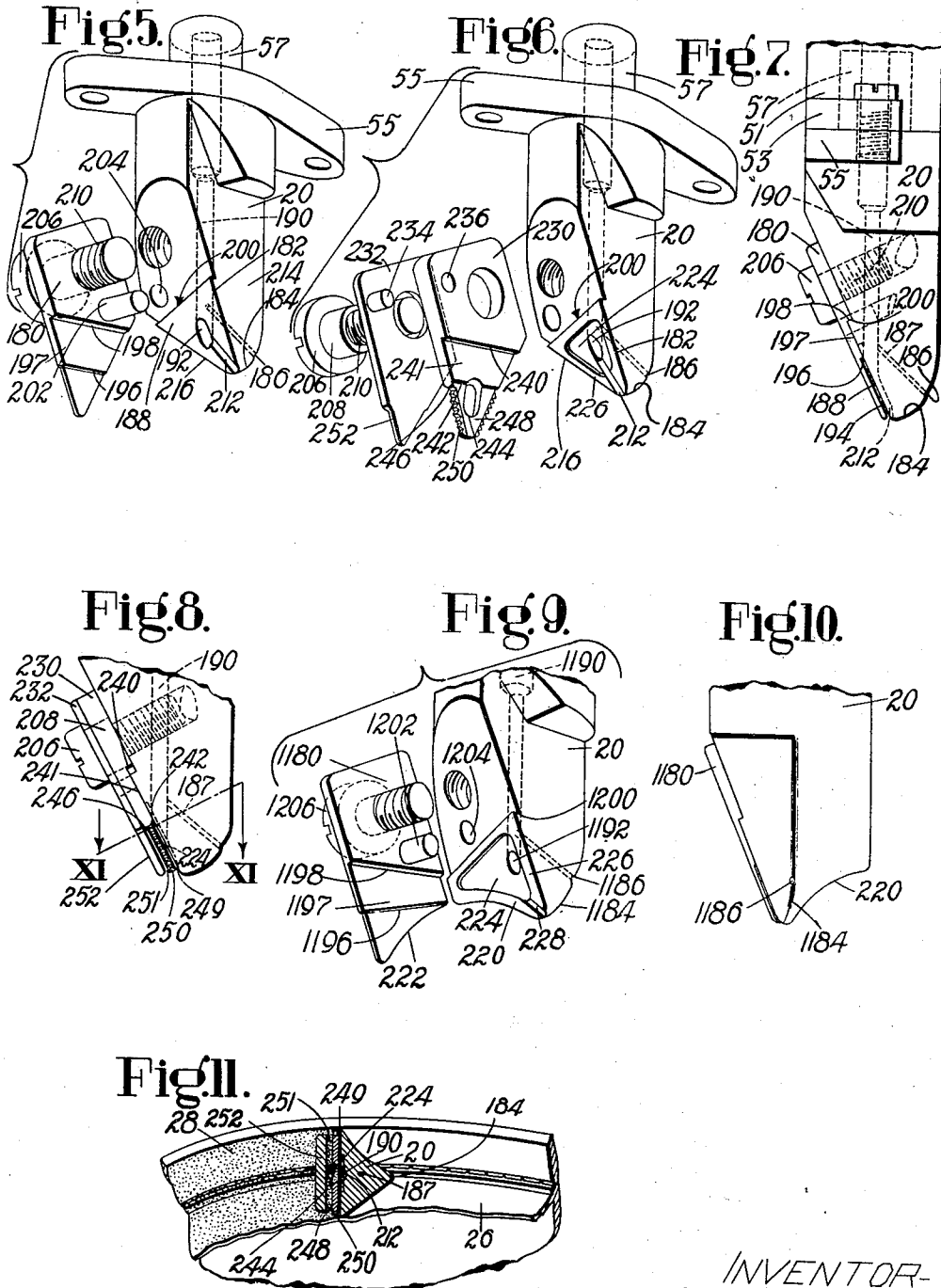
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CHANNEL CEMENTING MACHINE

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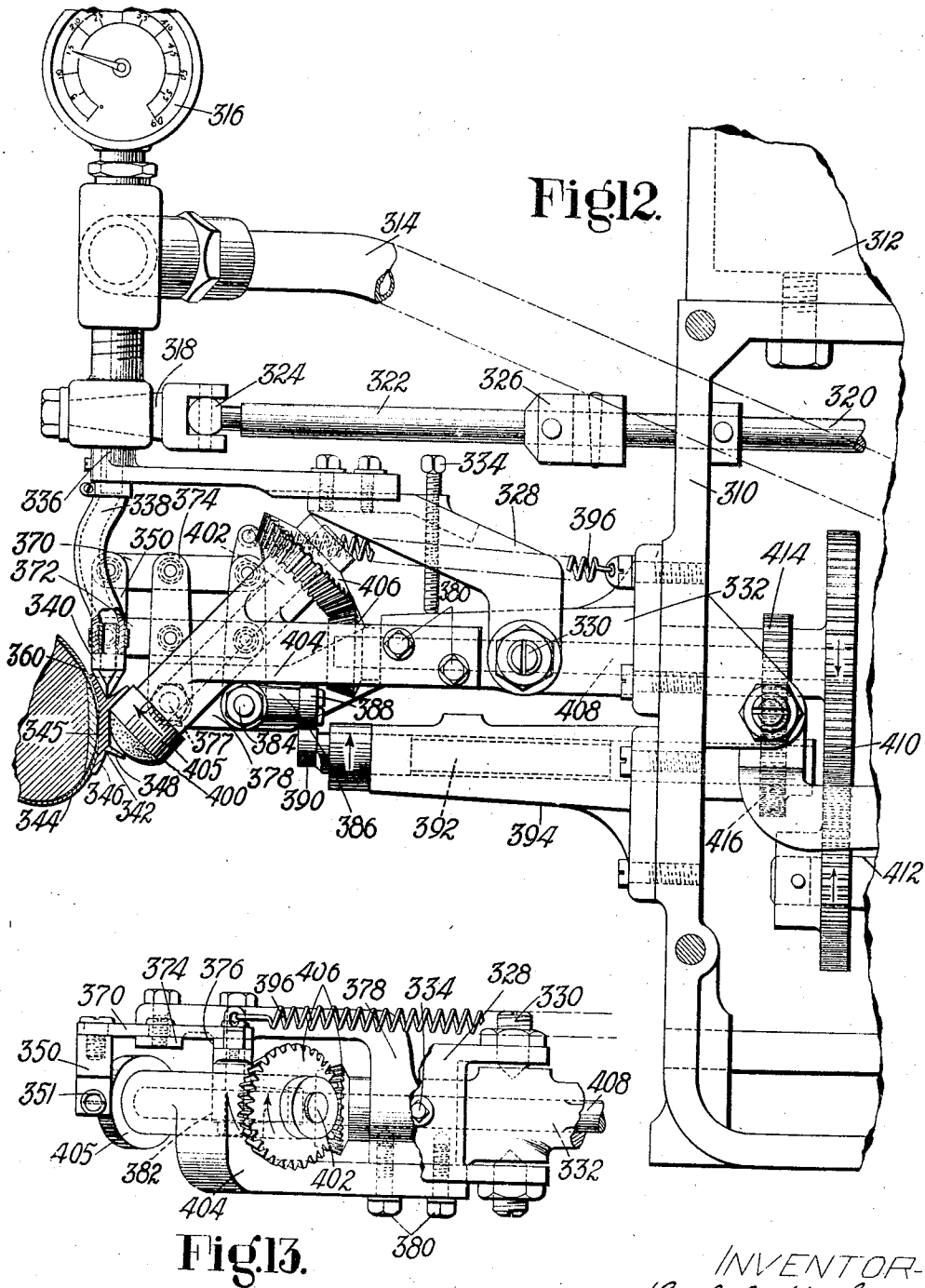
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CHANNEL CEMENTING MACHINE

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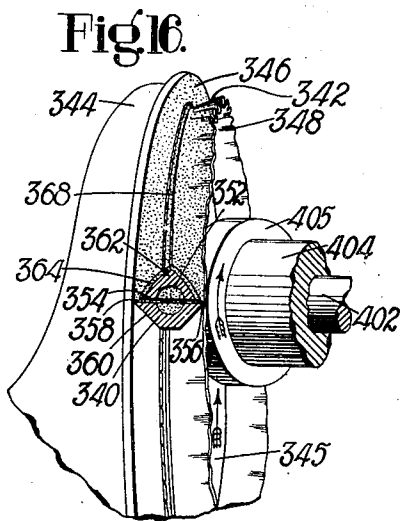
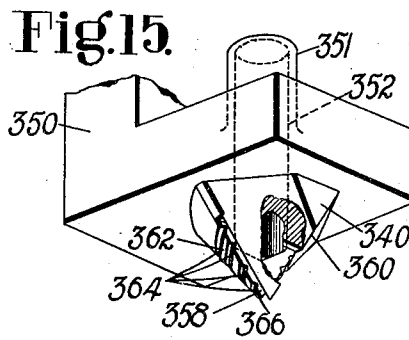
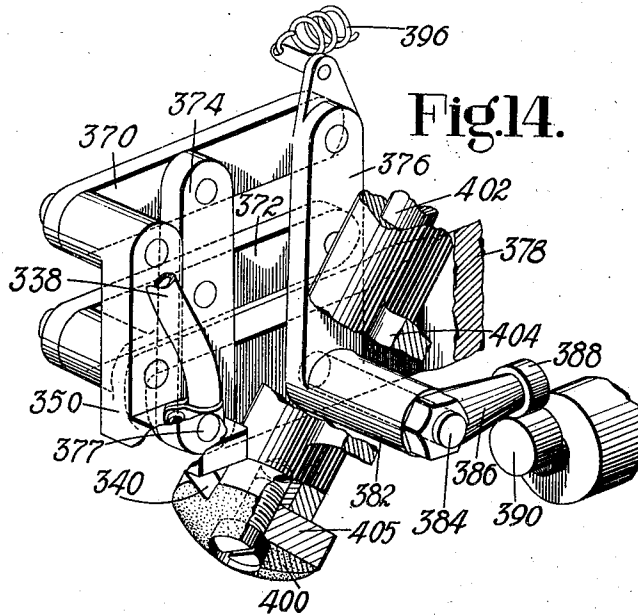
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CHANNEL CEMENTING MACHINE

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5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

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CHANNEL CEMENTING MACHINE

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Original application September 28, 1935, Serial
No. 42,659. Divided and this application No-
vember 25, 1936, Serial No. 112,723. In Great
Britain September 25, 1935

10 Claims. (Cl. 12—80)

This invention relates to shoe cementing machines and is herein illustrated as embodied in a machine for applying cement to the channels of shoe soles after the seam has been formed, thereby to hold down the flap.

The application of cement to channels has heretofore been carried out principally by the use of a driven applying brush and while such machines have been made to serve their purpose when employed for applying cement of the naptha-cut rubber type, it has been necessary to apply an excessive quantity of cement because of the nature of the work. Cementing the channel takes place after the sole has been sewed to the shoe and, consequently, the channel bed at the shank of the shoe lies in a radically different plane from the channel bed at the forepart of the shoe, the contour of the channel at the ball line and at the toe being also abruptly curved. Furthermore, it is well understood that the channel flap, after it has been turned back to facilitate the sewing of the sole, is wrinkled and may stand upright from the sole or lie forward toward the channel base or even be tilted back away from the channel base. Frequently, the channel flap has dried and become stiff and hard at the time when the shoe is ready to be cemented. If this is the case, it presents a very uneven surface which must, nevertheless, be fairly uniformly coated with cement if the flap is to be made to stick to the sole. When the cement employed is of the naptha-cut rubber type or of the latex type, the danger of seriously damaging the shoe in case the upper is accidentally soiled is not very serious because these cements can be removed successfully with suitable cleaners from most types of leather. If, however, it is desired to use cements of the pyroxylin type or of the polymerized chloroprene type, one of which is known commercially as DuPrene, then the danger of soiling the shoe becomes a very real handicap because these cements cannot be removed readily, if at all.

Accordingly, an important object of the invention is to provide a channel cementing machine by means of which a cement may be applied to the channel uniformly, and in just the desired quantity, without soiling other parts of the shoe.

As in most other types of channel cementers, the shoe is held up against the depending applying device and is moved progressively to present successive portions of the channel to the applying tool. This manner of presenting the work is facilitated, in accordance with a feature of the

invention, by a power-operated means engaging the shoe to help move it past the nozzle. In an illustrated construction, a resilient member is provided which contacts with the exposed bottom surface of the sole adjacent to the base of the channel flap. Means is also provided for supporting the channel flap with respect to the nozzle and this is shown as combined with the work-feeding device.

Still another feature of the invention resides in an arrangement for oscillating the nozzle about its apex and substantially about the bottom of the channel. Thus, even though the range of oscillation be relatively small, the application of a uniform coating is facilitated and the feeding of the work is rendered easier.

This application is a division of my application Serial No. 42,659, filed September 28, 1935, and directed to novel features of the extruding nozzle.

These and other features of the invention will be described in the following specification, taken in connection with the accompanying drawings, in which

Fig. 1 is a side elevation of one embodiment of the invention, showing a machine with a side plate removed to disclose the parts within a hollow frame;

Fig. 2 is a detail view, shown upon a larger scale, of control mechanism for a flap-lifting finger;

Fig. 3 is an angular view of the operating tools, showing the presentation of a piece of work to the machine;

Fig. 4 is a detailed section through an eccentric connection in the drive of the flap-lifting finger;

Fig. 5 is an angular view on a much larger scale of a nozzle, with a cover plate removed;

Fig. 6 is a similar view of a modified construction in which two plates are employed;

Fig. 7 is a side elevation of the nozzle shown in Fig. 5, with the cover plate in position;

Fig. 8 is a side elevation of the nozzle shown in Fig. 6 with the plates in position;

Fig. 9 shows a modified form of the nozzle of Fig. 5;

Fig. 10 is an elevation looking at the leading edge of the nozzle shown in Fig. 9;

Fig. 11 is a plan view of a fragment of a shoe sole, showing the flap in lifted position, and illustrating the application of cement by means of a nozzle such as that shown in Fig. 8, the end portion of which is shown in a section taken on the line XI—XI of Fig. 8;

Fig. 12 is a side elevation of another embodiment of the invention, showing the work-engaging parts of the machine together with a part of the supporting frame;

5 Fig. 13 is a plan view of the mechanism, as shown in Fig. 12, for oscillating the nozzle and for driving the feed roll;

Fig. 14 is an angular view of this mechanism on a larger scale;

10 Fig. 15 is an angular view on a still larger scale of the cement-applying nozzle illustrated in connection with the embodiment shown in Fig. 12, and

Fig. 16 is an angular view looking at the channel 15 of the forepart of a shoe, showing, in section, the tip of this form of the nozzle in operative position, together with a fragment of the feed roll.

In the embodiment illustrated in Figs. 1 to 11, inclusive, a machine frame 10 is mounted upon a 20 pedestal 12 and supports a cement receptacle 14 as well as a pump casing 16 containing a gear pump by which cement taken from the receptacle 14 is extruded under pressure through a flexible tube 18 to a nozzle 20 by which it is applied to 25 the work. A piece of work, such as a shoe 22 mounted on a last, has an outsole attached by stitches positioned at the apex or bottom of a channel cut in the sole. In the cutting of this channel, there is formed a channel flap 26 which 30 is to be cemented to the bed 28 of the channel in the position which it occupied before the channeling cut was made. The shoe is moved progressively past the nozzle 20 to cause the treatment of successive portions of the channel flap and the channel bed. Control of the quantity of 35 cement extruded may be effected in any desired way, as by a by-pass valve (not shown) adjusted by a thumb screw 29.

The frame 10 comprises parallel side plates 30 40 and 32 which are held in spaced relation by a plurality of shouldered bolts, such as the one shown at 34, and some of which are utilized as pivots, as will be later described. At the top of the frame and between the plates 30 and 32 is 45 mounted a block 36 which is held in position by bolts passing through the holes 38 and which supports a rod 40 upon which there is mounted a nozzle carrier 42. This rod 40 may be adjusted in and out, and is held against turning by a 50 pointed screw stud 44. The nozzle carrier is split at its upper end and held in the desired position on the rod by pinch screws 46 (Fig. 3). A nozzle stem 51 has a flange 48 which is supported on spaced flanges 50 formed upon the 55 carrier 42 and to which it is bolted. The connection between the flexible tube 18 and the nozzle stem 51 comprises a fitting 52 which contains a turn valve 54 and is provided with a base 56 secured in tight relation to the flange 48 of the nozzle stem 51 by screws (not shown). The upper 60 end of the fitting is threaded in a T fitting 58 which supports a pressure gage 59 and is joined to the tube 18. From Figs. 1, 5, and 7, it will be seen that the nozzle 20 itself has a flange 55 and a nipple 57. This nipple is received in a socket in 65 the lower end of the stem 51 which has a flange 53 held to the flange 55 by screws.

Provision is made for feeding the work by means of a rubber-tired roll 60 mounted on a 70 stub shaft in an arm 62 which is pivoted on a pin 64 at the extreme right side of the machine so that the roll may be lifted slightly by the work to accommodate variations in the shape of the shoe. The pivotal movement of the supporting 75 arm 62 is guided by fitting this arm between the

side plates 30 and 32. In order to drive the feed roll 60, the stub shaft on which it is mounted is connected by pinions 66 with a counter shaft 68 5 journaled in the carrier arm 62. This counter shaft 68 is joined by miter gears 70 to another counter shaft 72 which, in turn, derives power from a main drive shaft 74 of the machine through spiral gears 76. These gears rotate a short shaft 78 which is joined to the counter shaft 72 by an extensible shaft 80 containing 10 universal joints. This arrangement gives complete freedom for up-and-down movement of the feed roll 60 without interfering with the drive.

In view of the fact that the channel flap 26 lies in all sorts of angular positions with respect to 15 the channel bed 28, and the further fact that it is wrinkled and frequently stiff and dry, it has been found desirable to press the flap against the side of the nozzle 20 by means of an oscillated flap-pressing finger 82. To this end, the finger 20 is clamped in the lower arm of the bell crank lever 84 (Fig. 3) which is pivotally supported by depending arms 86 secured to the nozzle carrier block 42. A vibratory motion is imparted to the finger 82 by means of a horizontal rod 88 loosely 25 received in a groove in the block 36 and connected to the upper arm 90 (Figs. 1 and 2) of a drive lever through toggle links 92 and 94. Thus, the flap is pressed firmly against the nozzle but is intermittently released so that the work may be 30 fed freely. At the point where the rod 88 is joined to the toggle link 92, it is pivotally supported upon a hanger 96 swinging from a pivot 98 in the block 36. A spring 100 surrounding the rod 88 bears against a portion of the nozzle-supporting block 36 and tends to return the finger 35 82 to a position spaced from the nozzle when there is no work in the machine, this movement being limited by a collar 102. Thus, when the machine is at rest, there is always plenty of room 40 to bring the channel flap into position between the finger and the nozzle or to remove it at the end of a cementing operation. If the flap is turned well back against the sole, then the finger 82 serves also to lift it into cementing position. 45

The rod 88 is joined to the bell crank 84 by a pivot block 104 adjustably slidable along the rod and held in position thereon by nuts 106. As will be seen from Fig. 4, this block 104 has a pivot pin 108 received in an eccentric sleeve 110 which 50 may be rotated to determine the exact relation of the operative position of the finger 82 with respect to the nozzle so as to accommodate different thicknesses of channel flaps thereby firmly to support the flap in coating relation to the 55 nozzle without hindering the feed of the work. A rough adjustment of this position, and, hence, of the limits of the range of oscillation, is secured by adjustment of the pivot block 104 on the rod 88 by means of the nuts 106 but, when the operator changes from one class of work to another, such an adjustment as is provided by the nuts 106 is somewhat slow. There is provided, therefore, the eccentric sleeve 110, which may be held 65 in adjusted position by means of a ratchet 112 formed on the sleeve and having saw-like teeth to receive a spring-pressed pawl 114. The saw-toothed ratchet 112 forms an easily grasped handle for turning the sleeve 110 and, the inclination of its teeth being equal in both directions, 70 the handle 112 may be turned either way, sliding over the beveled upper end of the pawl in so doing.

The oscillation of the rod 88 to vibrate the finger 82 is effected when the toggle links 92 and 75

94 are in line, as shown in Fig. 1, by means of the lever 90 on the lower arm 120 of which is a roll coacting with a serpentine-path cam 116 formed on or attached to a drive pulley 118 which is secured to the shaft 74. This lower arm 120 is outside the frame 30 and is joined to the upper arm of the lever 90 through a forked portion 122 extending around the edge of the frame. The design is such that the finger 82 is oscillated about 2400 times per minute and the flap is thereby pressed firmly against the side of the nozzle without interfering with the feed of the work. It will be noted that the drive shaft 74 is connected to the pump within the casing 16 by pinions 124.

For controlling the machine, there is provided a treadle rod 130 connected at its lower end to a treadle (not shown) and joined at its upper end to a plate 131 forked at its upper end to receive a vertical plate 132, the two being pivotally connected to one another and to a lever 154 to be later described. In the lower portion of the plate 131 is a slot 134 for the reception of a transverse pin between the branches of a forked lever 136, the left end of which is pivoted on a shouldered bolt between the side plates 30 and 32 of the frame, and the right end of which is joined by a rod 138 to an operating lever 140 for the valve 54 in order thereby to control the flow of cement through the nozzle 20. This operating lever 140 is secured to a rod 142 pivoted in a depending portion 144 of the block 36, and the rod is joined to the valve 54 through an intermediate shaft 146 having universal joint connections to the valve 54 and the rod 142. One of these universal connections is forked to enable the ready removal of the valve fitting 52 and is held in operative relation by a spring 148 surrounding the rod 142. A stop screw 150 determines the closed position of the valve by limiting the upward movement of the operating lever 140 under the action of a spring 152 which is joined at its upper end to the block 36 and at its lower end to the forked lever 136. To limit the downward movement of the treadle rod and the plates 131 and 132, the two are pivotally connected to each other and to a lever 154 having a portion 156 which abuts a stop 158 formed as a part of the frame member. The lever 154 swings on an eccentric portion of its pivot pin, thus facilitating assembly of the machine by allowing this lever to be brought into correct relation to associated parts by turning the pin.

The same treadle rod 130 is arranged to control the vibrations of the flap-pressing finger 82 by either breaking or straightening the toggle links 92, 94. To this end, the upright plate 132 has a slot 160 which surrounds a pin 162 connecting the toggle links. When the treadle is depressed, the toggle is straightened and the oscillations of the lever 90 are transmitted to the finger 82. When the treadle is released and is raised by the spring 152, then the toggle is broken and the continuing oscillations of the lever 90 are not transmitted to the rod 88. The shape of the lower portion of the slot 160 is such (Fig. 2) that movements of the lever simply oscillate the link 92 about its pivotal connection with the rod 88 without disturbing the plate 132 or the treadle rod 130. At that time, the spring 100 will draw the finger 82 to an inoperative position, away from the nozzle.

The arrangement of the machine is such that the feed roll 60 is held resiliently against the work by a connection to this same treadle rod

130 and, to this end, a lever 164 pivoted in the frame is slotted to receive a block 166 which is secured to the lever by pin 168, this block surrounding the rod and being held against a stop collar 170 thereon by a spring 172 surrounding the treadle rod and bearing against the upper side of the block 166. The lever 164 is joined to the arm 62 which supports the feed roll 60 by a link 174. When the operator depresses the treadle, thereby drawing the treadle rod down to a position illustrated in Fig. 1, he first moves the feed roll 60 into contact with the shoe already positioned with respect to the nozzle 20, straightens the toggle to cause oscillation of the flap-pressing finger 82 and then opens the valve 54. Upon reverse movement of the treadle, the opposite action takes place and the valve is closed to stop the flow of cement and the finger 82 is stopped in open position, before the feed roll 60 is lifted from the work by the connection embodying the collar 170, the block 166, the lever 164 and the link 174. Thus the shoe is always moving forward when the finger 82 is oscillated and when the cement is extruded through the nozzle.

The nozzle 20 is positioned in the machine as shown in Figs. 1 and 3 in depending position and is inclined downwardly and forwardly with respect to the direction of movement of work presented thereto so that a removable plate 1180 secured to the outlet face of the nozzle lies approximately in a vertical plane passing through the axis of the feed roll. The lower end of the nozzle is tapered heightwise at 182 (Fig. 6) to aid in pushing it into the channel and is formed with a comparatively sharp leading edge 184 (Fig. 11) in which there is an outlet 186 (Figs. 5, 6, and 7) to deliver cement at the bottom of the channel. This cement also lubricates the nozzle, as it were, making it easier to feed the work. The nozzle also has a substantially triangular face 188 through which, at 192, emerges a passage 190 extending down through the nozzle. The outlet 186 communicates with the passage 190 through a branch passage 187. It is through this passage 190 that cement is pumped at substantially constant pressure when the valve 54 is opened. As shown in Fig. 3, the shoe is moved away from the operator so that it approaches the leading edge 184 of the nozzle and so that the face 188 and the cover or deflector plate 1180 are upon the trailing face of the nozzle.

It is desired, then, to cause the cement to be applied uniformly upon both the channel flap 26 and the channel bed 28 as well as in the bottom of the channel. To this end, the cover plate 180 (Fig. 5), positioned directly to overlie the outlet opening 192 of the passage 190, acts as a deflector and cooperates with the face 188 to provide a transverse slot 194 (Fig. 7) forming lateral delivery passages or slots extending from the apex of the tapered end of the nozzle heightwise thereof to a point determined by a shoulder 196 on the cover plate. A series of cover plates having this shoulder positioned at various distances from the pointed lower end may be utilized for channels $\frac{1}{4}$ -inch, $\frac{1}{8}$ -inch or $\frac{3}{8}$ -inch wide. Such nozzles, with their narrow outlet slots, show a notable flexibility in their ability to coact properly with channels, the depth of which varies between different parts of a shoe. Thus, even if the slot is longer than the channel is deep, the cement, due to its cohesiveness, will draw down from the upper end of the slot

to the upper edge of the work being coated without being extruded over the edge of the channel flap or the channel base, as the case may be. Were a series of holes employed instead of a slot, the cement extruded from the exposed upper holes would be forced over the edge of the channel flap or the channel base. The cover plate is also provided with a shoulder 138 which is intended to rest upon a shoulder 200 (Figs. 5 and 7) formed upon the nozzle thereby to assist in locating the cover plate in exact relation to the triangular face 188 of the nozzle. The area 197 between the two shoulders fits closely against the end face 188 to avoid any tendency of the edges of the cover plate to scrape off the cement already applied. The outline of the triangular portion of the cover plate is slightly smaller than the corresponding outline of the face 188. Further to assist in locating the cover plate upon the nozzle, there may be provided a pin 202 which is received in a socket 204 in the nozzle. The cover plate will be held in position by a screw 206 having a threaded stem 210. The elliptical opening 192 formed where the passage 190 emerges in the face 188 is joined to the apex of the tool by means of a shallow groove 212 thereby insuring delivery of a sufficient quantity of cement to the bottom of the channel.

When the nozzle is in position in the machine, the channel flap 26 will be pressed against the plane surface 214 whereas the bed of the channel will be held against the opposite surface of the nozzle terminating in the edge 216. Under some conditions, the bed 28 of the channel will not be flat but will be curved away from the plane of the bottom of the sole toward the shoe upper. This will be found in women's close-edged shoes and may result in a different curvature of the channel bed around the forepart than that which is in the shank. In order to adapt the nozzle for best operation with a close-edged shoe, it is found desirable to change the nozzle construction to that shown in Figs. 9 and 10 where parts similar to those shown in Fig. 5 have been given similar numerals to which 1000 has been added. This nozzle differs from that shown in Fig. 5 in having an inner or back surface which is curved inwardly to form a valley terminating in the curved edge 220 which will be close to the shape of the channel bed around the forepart of the shoe and will approximate that found in the shank of the shoe. With this construction, the cover plate 1180 is also provided with a pointed end having a curved edge 222. It will be noted that the shoulder 1196 in the cover plate provided for this style of nozzle is not exactly parallel to the shoulder 1198 but deviates from that relation in accordance with the need for providing outlet passages which will coact with the widths of the channel flap and the channel bed.

In constructing nozzles of the type shown in Fig. 5, it is common to do some hand filing where the groove 212 joins the elliptical outlet opening 192 and sometimes this is done carelessly, bringing the opening nearer to one side edge than the other. This renders unequal the frictional resistance offered to the cement flowing to the two sides and results in a somewhat uneven distribution of cement upon the two sides of the channel. It is avoided by forming a recess 224 (Figs. 6 and 9) in the end face of the nozzle which is separated from the edge of the nozzle by a ledge 226 of uniform width, thus insuring an even distribution of cement. In the form shown in Fig.

9, this recess is joined to the tip of the nozzle by a groove 228 corresponding to the groove 212 in Fig. 6.

When the nozzle is to be employed for cements of the polymerized chloroprene type, one form of which is marketed under the name DuPrene, then a nozzle construction such as that shown in Figs. 6 and 8 may be advantageously employed and has a pair of cover plates or deflectors 230 and 232. These deflectors, which are kept in alignment with one another by means of a stud 234 entering a socket 236, are mounted for slight lateral movement around a cylindrical portion 208 on the screw 206. To this end, the shoulder 240 on the inner plate 230 is spaced slightly from the shoulder 200 on the nozzle. The intermediate plate 230, having a surface 241 in close contact with the end surface of the nozzle, is also provided with a shoulder 242 corresponding to the shoulder 196 and, when positioned in cement-tight relation to the end face 188, forms a transverse slot 243 terminating in lateral passages through which the cement is extruded upon the channel flap and the channel bed. This intermediate plate is also provided with an elongated opening 244 opposite the outlet end of the passage 190 (Fig. 11) so that a portion of the cement passes directly to the slot 251 (Figs. 8 and 11) between the lower portion of the intermediate plate 230 and the face of the outer plate 232. This slot is limited by a shoulder 246 upon the forward face of the plate 230. Thus, two slots are formed providing two lateral passages upon each face of the nozzle, these being separated by the thin lower end 248 of the intermediate plate 230. The edges of the lower end 249 are serrated at 250 thereby to provide a sort of spreading action for the cement which is delivered to the work from the slot 249. The generally triangular lower end 248 of the intermediate plate is slightly smaller than the corresponding portion of the nozzle, while the outline of the lower end 252 of the cover plate 232 is even smaller and is rounded on the outer edges. This, together with the opportunity for slight lateral displacement of the lower ends of the two cover plates with respect to the nozzle, reduces any interference between the nozzle and the shoe to a minimum as the nozzle treats sharply curved portions of the channel. The cement extruded through the first slot 249 is effective to wet the surface of the leather of the channel flap and channel bed while that extruded through the second slot 251 is enabled thereby to stick even more readily to these already coated surfaces, and to be applied in uniform and predetermined quantities.

The operation of the machine has already been set forth in connection with the description of the control devices joined to the treadle rod 130.

Turning now to the embodiment illustrated in Figs. 12 to 16, inclusive, there is shown in Fig. 12 a machine in which a receptacle 312 is supported upon a frame 310. From this receptacle cement is forced through a delivery conduit 314 by any suitable pump (not shown). The pressure applied to the cement in this delivery conduit is measured by a gage 316 and the delivery of the cement is controlled by a turn valve 318. This valve is operator controlled and may be connected through a shaft 320 to a treadle (not shown). The shaft 320 is journaled in the side of the frame and is connected to the valve 318 by a shaft portion 322 having universal joints 324 and 326. This valve and gage may be supported upon an

arm 328, as in the machine illustrated in Letters Patent of the United States No. 2,042,479, granted June 2, 1936, upon my application, for improvements in Machines for applying activating liquids to cemented shoe parts. This arm 328 is pivoted at 330 upon a bracket 332 attached to the frame and its position is determined by a stop screw 334. The cement is conducted from the outlet 336 of the valve 318 to a nozzle 340 through a flexible tube 338.

This nozzle, the shape of which is shown most clearly in Fig. 15, is tapered axially, as in the nozzles previously described, to facilitate its insertion in the channel 342 of the sole of a shoe 344 thereby to apply cement to the base 346 of the channel and to the channel flap 348. The nozzle 340, mounted directly upon a carrier 350, has a neck 351 and is provided with a passage 352. This passage communicates directly with a transverse slot 354 extending from the apex of the V-shaped end of the nozzle up opposite sides of the V thereby to provide lateral slots or passages 356 and 358 (Fig. 16). The base of the channel is adapted to be positioned alongside the passage 352, whereupon the passage 356 will lie beside the channel flap. These passages are of a substantially uniform width throughout their whole extent so that the cement is applied in uniform quantities transversely of the channel and, hence, as the shoe is moved at a uniform rate by work-feeding mechanism to be later described, in uniform quantities along the whole length of the channel. As will be seen from Figs. 15 and 16, the leading end 360 of the nozzle is tapered to facilitate movement of the shoe past the nozzle while the trailing end 362 is also tapered in order that there may be no clogging of the nozzle as it passes around the rather sharp curves at some portions of the shoe. It will be noted that the leading side 360 is slightly wider adjacent to the passages 356 and 358 than is the trailing side 362. This arrangement prevents the trailing side from having any tendency to scrape off the applied cement and, if desired, the trailing side 362 may be provided with horizontal grooves 364, still further to avoid displacement of the cement by the nozzle and acting as a sort of spreader.

The fact, previously mentioned, that the channel flap 348 is frequently stiff and is always wrinkled may make it desirable to oscillate the nozzle about its apex 366 which will lie substantially at the bottom of the channel adjacent to the seam 368. To this end, the nozzle carrier 350 may be pivotally supported upon parallel horizontal links 370 and 372 (Figs. 12 and 14) which, in turn, are pivoted upon upright links 374 and 376. The upright links 374 and 376 are pivotally mounted at their lower ends on pivot studs 377 and 384 upon a horizontal bracket 378 which is secured to the bracket 332 by screws 380. Provision is made for oscillating the nozzle by power applied to the upright link 376 which has a hub portion 382 pivoted on the stud 384 and provided with a lateral extension 386. This extension carries a roll 388 adapted to rest against an eccentric 390 upon a shaft 392 which is journaled in a bracket 394 attached to the machine frame. The roll 388 is held against the eccentric 390 by a spring 396, one end of which is attached to the frame 310.

Feeding of the shoe to cause the channel to traverse the nozzle is facilitated by a rounded, resilient feed roll 400 carried on the lower end of an inclined shaft 402 journaled in an arm 404 which is secured to the arm 332 by the screws

380 which also hold the bracket 378. This shaft 402 also carries a cylindrical work-engaging portion 405 which supports the channel flap 348 in a position closely adjacent to the side of the nozzle. The salient angle between the feed roll portion 400 and the cylindrical portion 405 is such that some room is given for the oscillation of the nozzle 340. The inclined shaft 402 is driven by miter gears 406 from a shaft 408 which is journaled in the bracket 332 and which is driven by meshing pinions 410 from a driven shaft 412. The drive of the shaft 392 by which the nozzle is oscillated is effected by pinions 414, 416 mounted on the shafts 408 and 392, respectively.

In operation, power being applied to force cement under pressure through the delivery conduit 314, the operator applies the channel of a shoe to the depending nozzle 340 with the flap 348 between this nozzle and the roll portion 405 and, opening the valve 318, causes the channel of the shoe to traverse the nozzle at a uniform speed, the feed roll 400, resting against the bottom of the sole, being constantly rotated to move the shoe. During this movement, the nozzle 340 will be oscillated by the eccentric 390 against the tension of the spring 396.

Specific features of the embodiment of the nozzle illustrated in Figs. 1 to 11, inclusive, are not claimed herein since they are claimed in an application of Wilbur B. MacKenzie, Serial No. 43,064, filed October 1, 1935. Features of the machine embodied in those figures are claimed in a division of that application, Serial No. 111,453, filed November 18, 1936.

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

1. In a machine for applying cement to a channel in the sole of a lasted shoe, a tapered extruding nozzle adapted to be received in the channel and constructed and arranged to apply cement directly both to the flap and the bed thereof, means for forcing cement through said nozzle, and power-operated means for engaging the shoe for causing a relative traversing movement between the nozzle and a shoe thereby to apply cement along the linear extent of the channel.

2. In a machine for applying cement to a channel in the sole of a lasted shoe, a tapered extruding nozzle having lateral passages, means for forcing cement through said nozzle, means for supporting the channel flap beside one of said passages to receive cement directly therefrom, and power-operated means for engaging the shoe to cause a relative traversing movement between the nozzle and a shoe thereby to apply cement along the linear extent of the channel flap and the channel bed.

3. In a machine for applying cement to a channel in the sole of a lasted shoe, a tapered extruding nozzle having lateral passages, the leading end of said nozzle being tapered to facilitate movement of the shoe with respect to the nozzle, means for forcing cement through said nozzle upon both the flap and the bed of the channel, flap-supporting means pushing the flap against the nozzle, and power-operated shoe-feeding means.

4. In a machine for applying cement to a channel in the sole of a lasted shoe, a tapered extruding nozzle adapted to be inserted in the channel of a shoe sole, said nozzle being provided with lateral passages extending axially of the nozzle, means for forcing cement through the passages

of said nozzle for application to a channel base and a channel flap, and a power-operated, shoe-feeding device constructed and arranged both to cause traversing movement of the shoe and to support the channel flap with respect to the nozzle.

5 5. In a channel cementing machine, an extruding nozzle, means for delivering cement through said nozzle directly to the channel of a shoe sole, and shoe feeding means comprising a roll one
10 portion of which is adapted to engage the bottom of the sole and another portion of which is adapted to support the channel flap for the delivery of cement thereto by the nozzle.

15 6. In a channel cementing machine, an extruding nozzle, and a driven roll having a salient portion entering the angle between the bottom of a sole and an upturned channel flap, a portion of said roll at one side of said salient portion being
20 resilient to engage and feed the work and a portion of the roll at the other side of said salient portion being adapted to support the channel flap with respect to the nozzle.

25 7. In a channel cementing machine, a tapered extruding nozzle adapted to be inserted in the channel of a shoe sole and having an outlet opening within the channel, and means for supporting said nozzle for oscillatory movement about a point substantially at the end of the nozzle.

8. In a channel cementing machine, a tapered extruding nozzle adapted to be inserted in the channel of a shoe sole and having lateral passages through which cement is extruded directly upon the channel base and the channel flap, and means for oscillating said nozzle about a point substantially at the apex of the nozzle. 5

9. In a channel cementing machine, a V-shaped extruding nozzle, lateral passages extending from the tip along the sides of said V-shaped nozzle heightwise thereof with respect to the depth of the channel in a shoe sole, means for forcing cement through said nozzle under pressure, and means for vibrating said nozzle from side to side of the channel about an axis substantially at the apex of the V-shaped nozzle. 10 15

10. In a channel cementing machine, an extruding nozzle having a tapered end portion adapted to be inserted in the channel and shaped at one side for engagement with the channel flap, means for holding the flap against the nozzle, said nozzle being provided with an elongated slot extending from the base of the channel substantially to the edge of the flap, and means for feeding the work past the nozzle. 20 25

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