March 6, 1951 W. E. NAUGLER 2,544,172

AUTOMATIC MACHINE FOR CEMENTING PLATFORM SOLES

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Fig. 2.

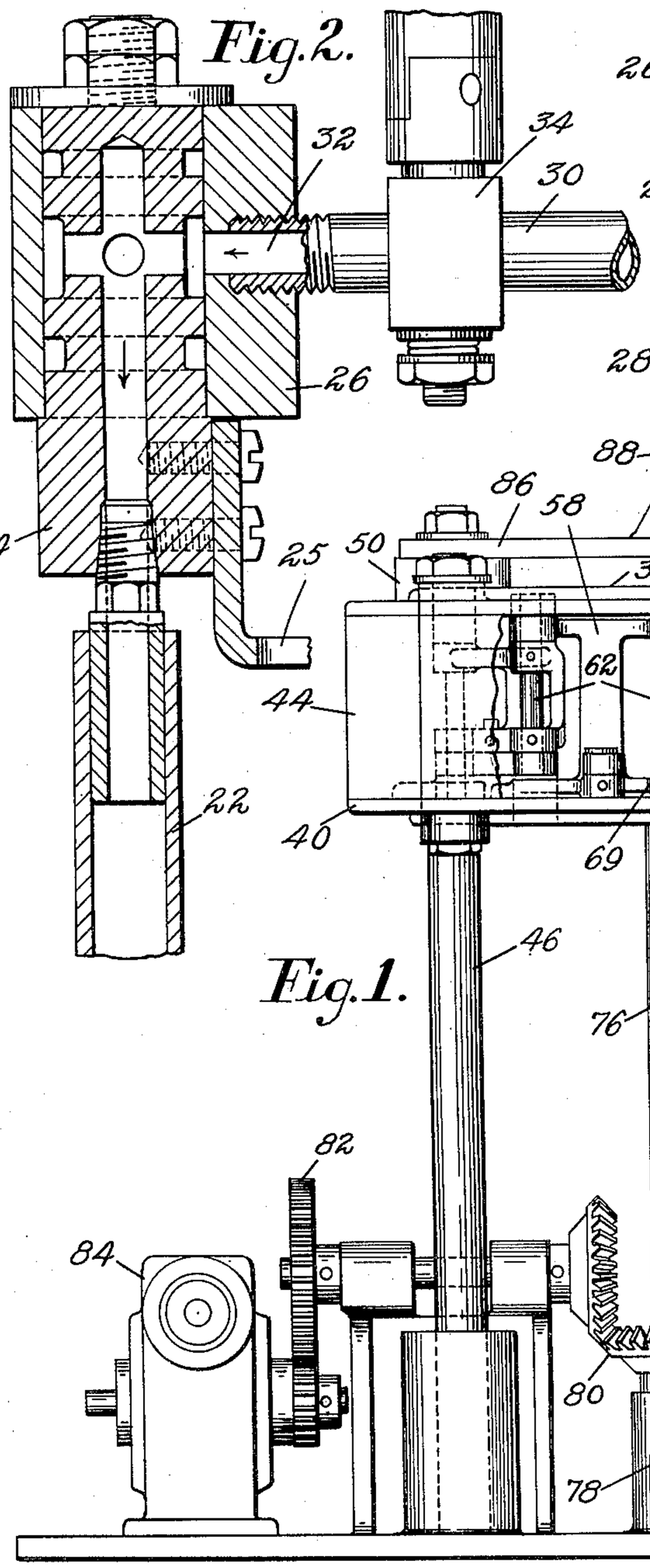

Fig. 1.

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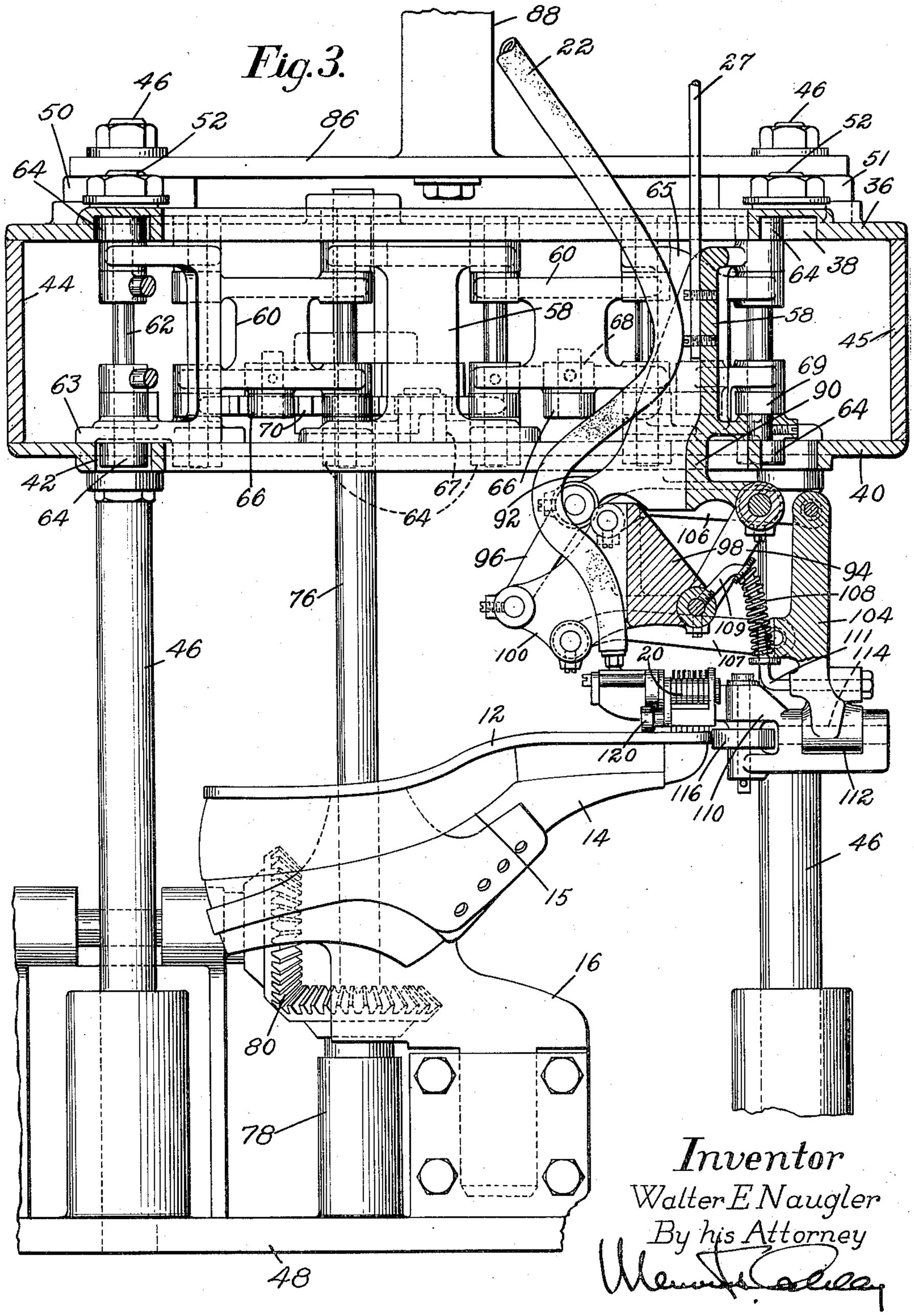
Fig. 3.



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AUTOMATIC MACHINE FOR CEMENTING PLATFORM SOLES

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Fig.4

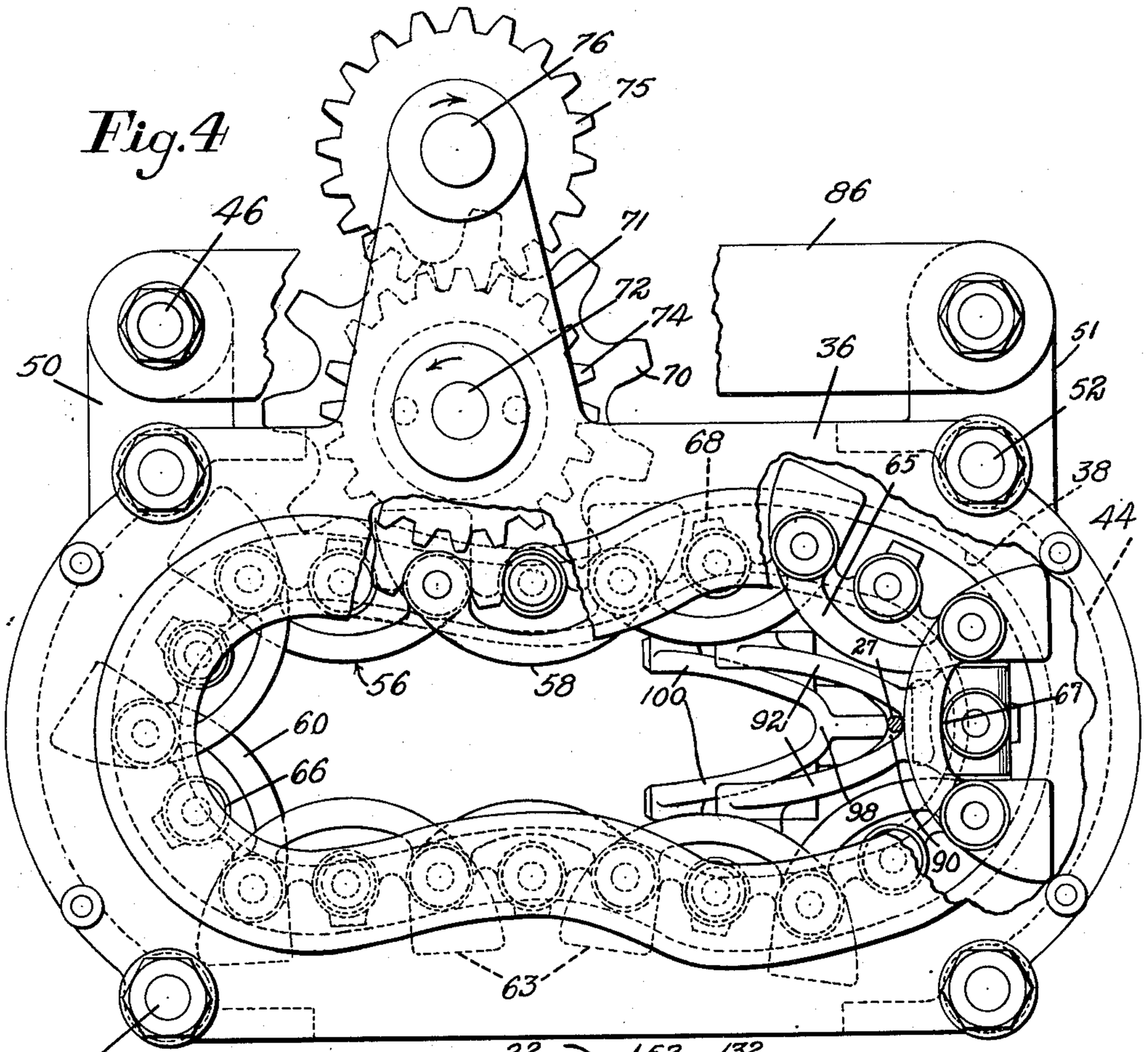
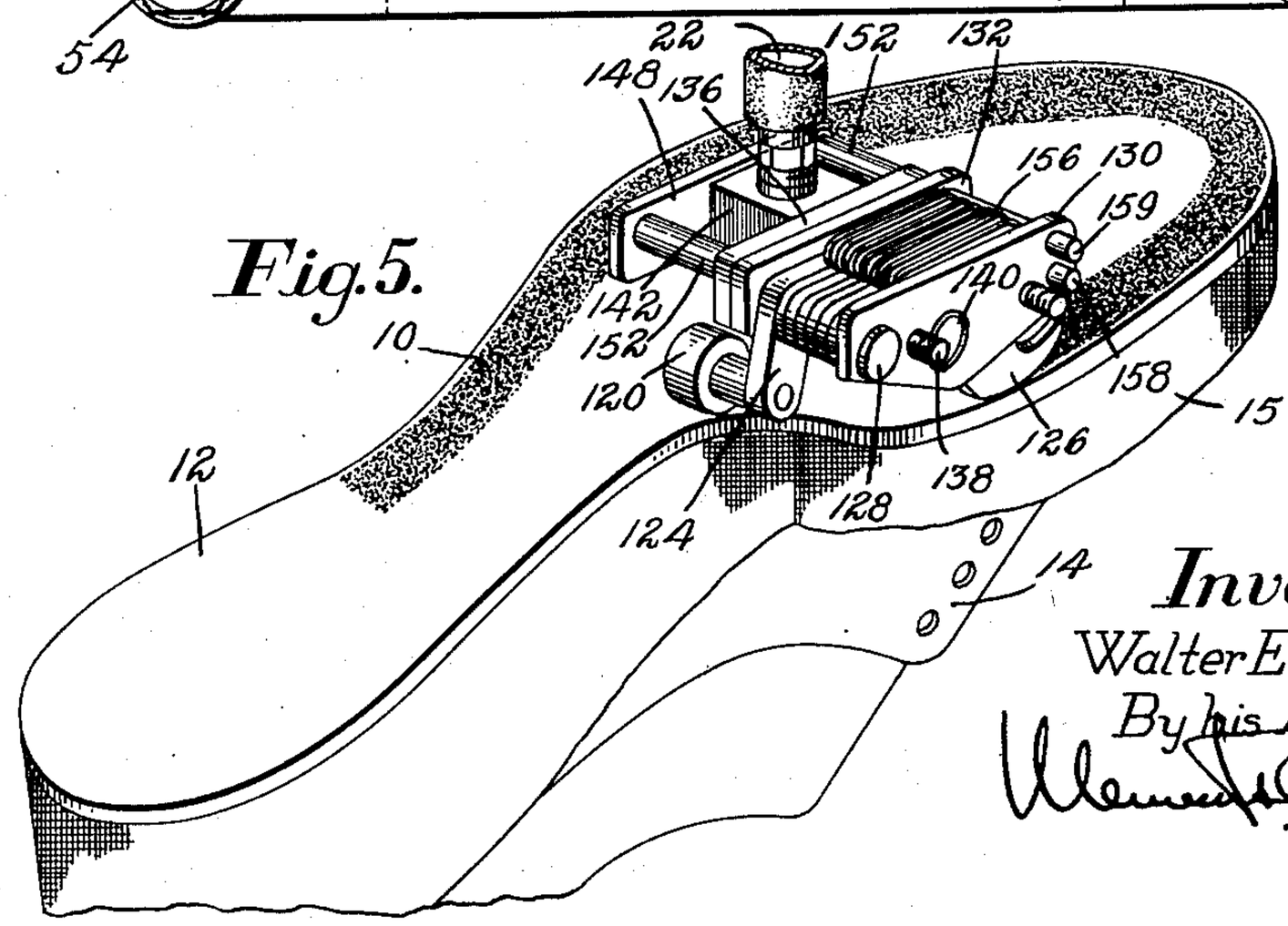


Fig.5.



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AUTOMATIC MACHINE FOR CEMENTING PLATFORM SOLES

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Fig. 6.

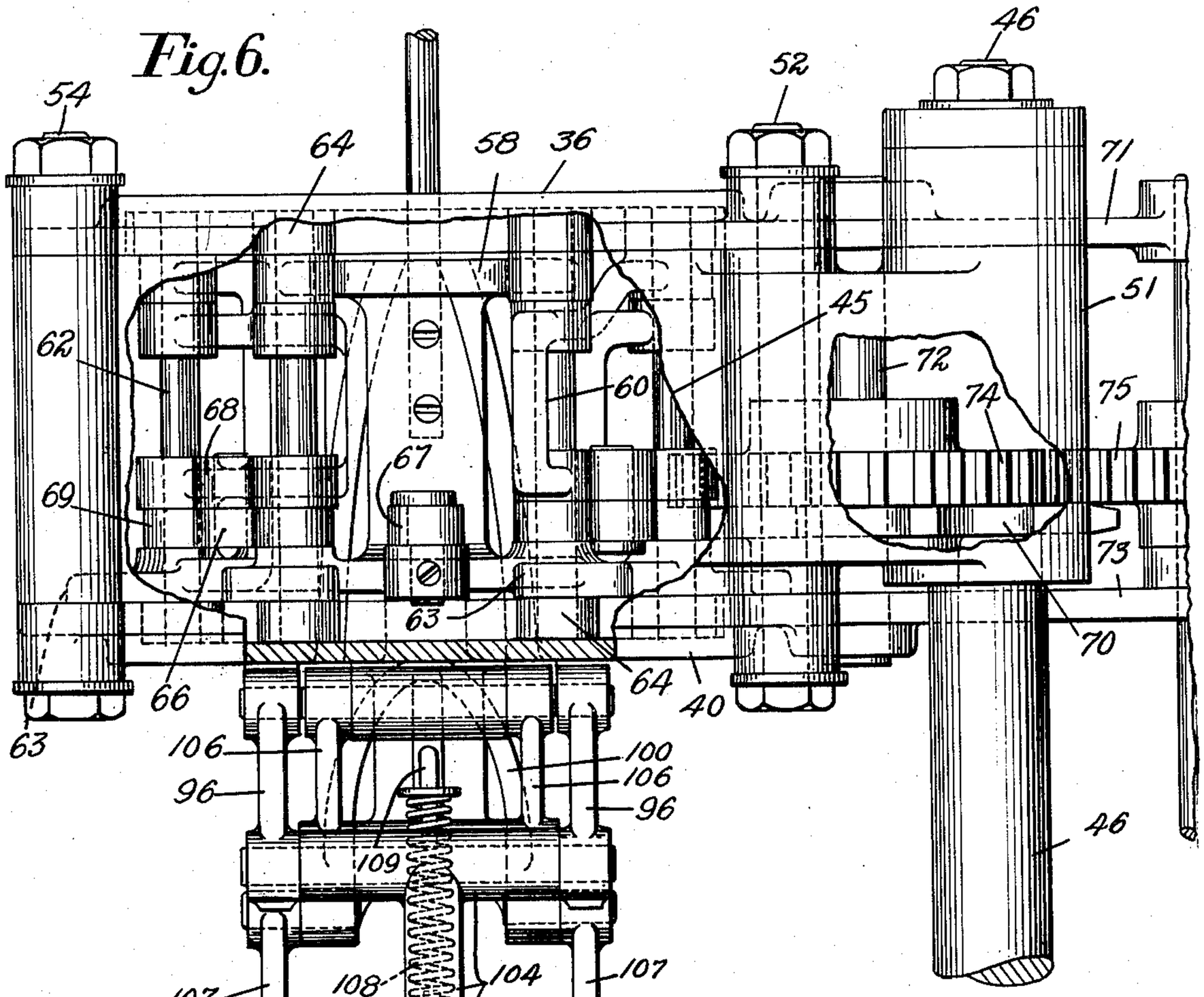

Fig. 7.

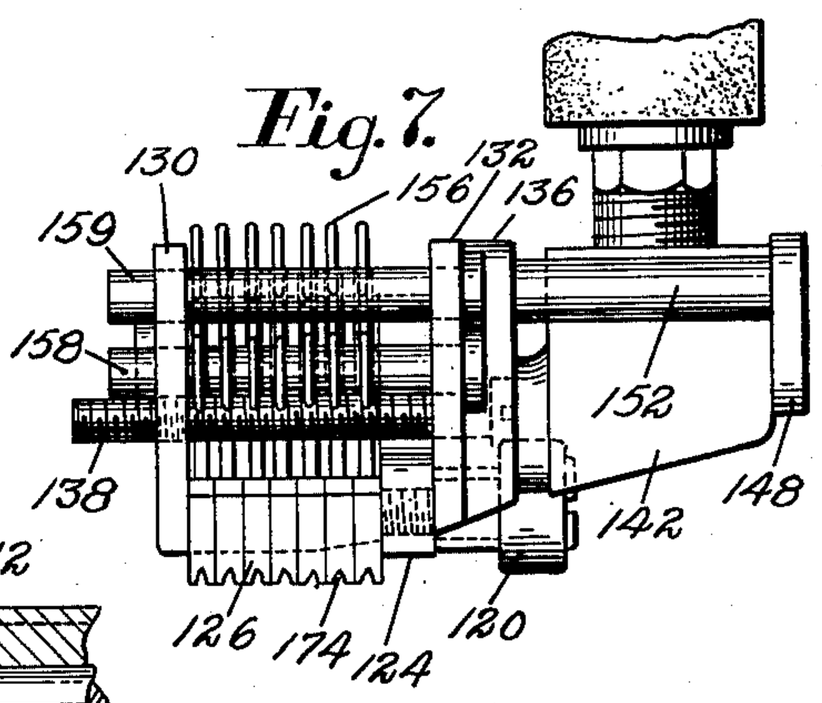

Fig. 8.

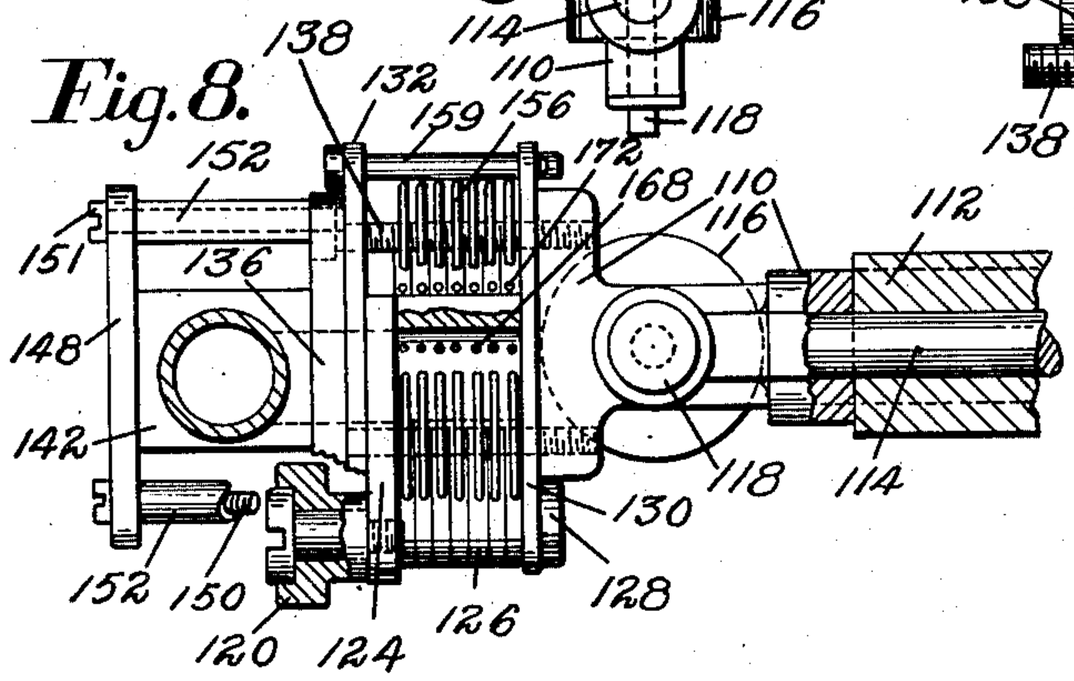

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Fig. 9.

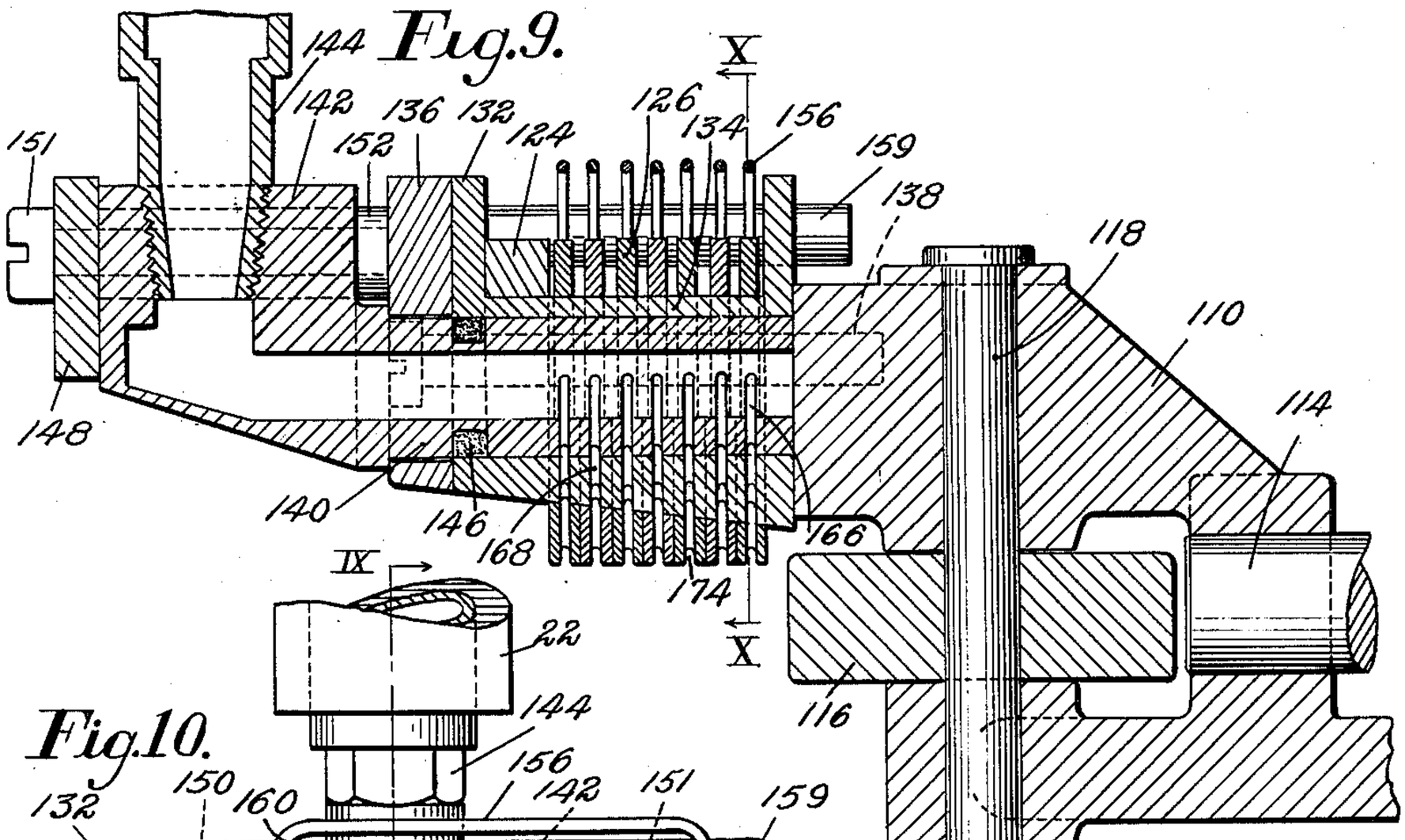


Fig. 10.

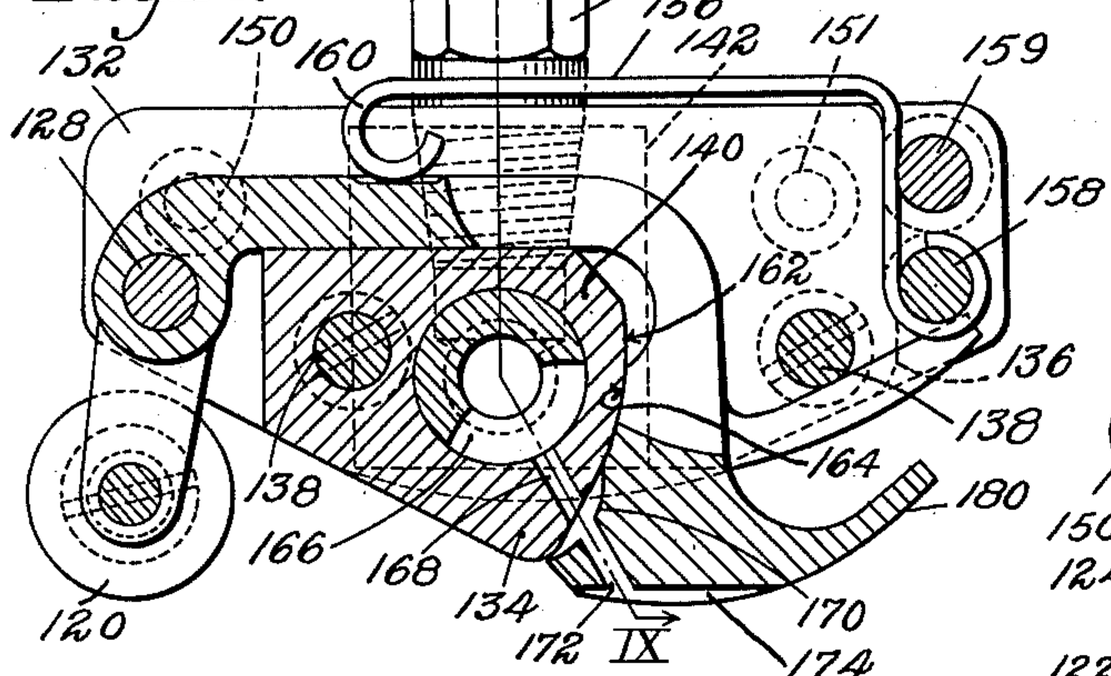


Fig. 12.

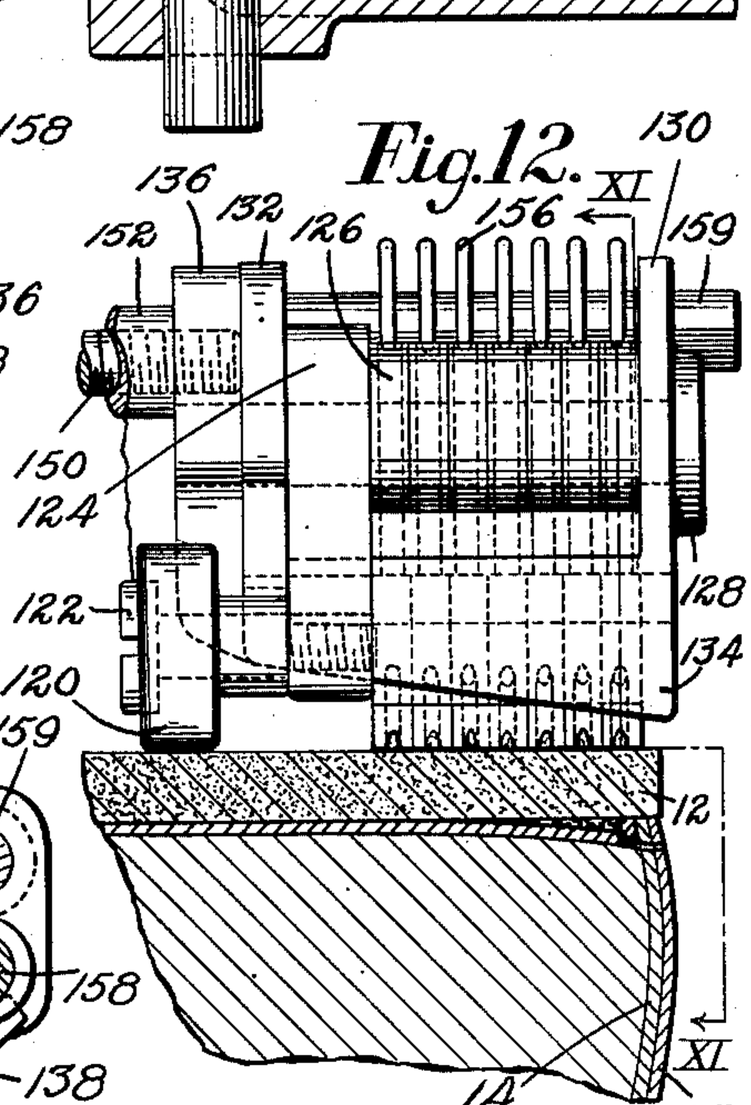
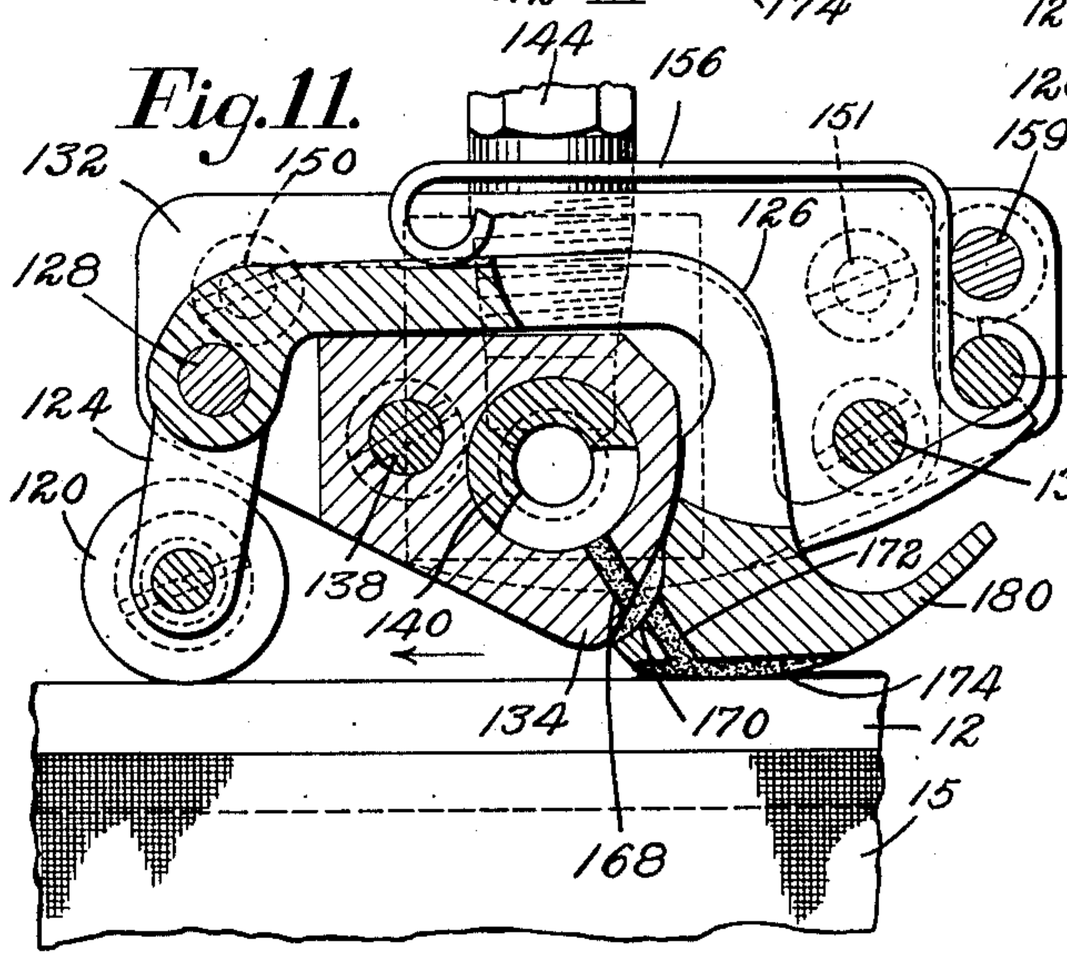


Fig. 11.



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Patented Mar. 6, 1951 2,544,172

UNITED STATES PATENT OFFICE

2,544,172

AUTOMATIC MACHINE FOR CEMENTING PLATFORM SOLES

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Application June 23, 1948, Serial No. 34,596

8 Claims. (Cl. 12—80)

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This invention relates to means for coating work pieces such as shoe parts, and is herein illustrated as embodied in a machine in which a coating nozzle is caused automatically to traverse the peripheral margin of the part.

It is common in the manufacture of shoes to apply a marginal band of coating material, hereinafter referred to as cement, to the bottom of a shoe. Such a band is sometimes employed for the attachment of an outsole to the shoe but it is herein shown as applied on the bottom face of a platform sole thereby to hold the subsequently lasted-over platform cover material.

It is important in all such operations that the band of coating material shall be accurately positioned upon the work and that it shall be of uniform thickness and evenly distributed, without holidays. In some machines the shoe is moved manually past an applying device while in other machines a relative traversing movement is produced automatically between the applying device and the margin of the work.

An object of the invention is to provide an improved machine of the latter type by which the time and cost of the operation may be reduced without lessening the quality of the work.

To this end, an applying nozzle is guided about the work by means of a supporting device which maintains the nozzle always in a radial position and at a uniform distance from the periphery of the work. The illustrated arrangement utilizes superposed tracks of approximately the contour of the work and the nozzle is hung from a chain which travels about these tracks. A supporting mechanism between the chain and the nozzle permits controlled radial and heightwise movements of the nozzle as it rides on the shoe sole.

Another feature of the invention resides in a hollow guiding and supporting mechanism having an applying device which is supplied by means of a flexible connection passing through the hollow support and thereby connected to the applying member with a minimum of distortion. As herein shown, the applying device is a nozzle connected by a flexible tube to the source of supply through a swivel connection which is above the support and is caused to turn with the moving nozzle so that there shall be no pinching of the tube.

Inasmuch as the work to be treated is of uneven contour the application of cement is effected by a flexible nozzle which is guided both heightwise and radially and which is arranged to apply a uniform coat throughout the length of the band

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around the work. The features of this flexible nozzle construction are claimed in a divisional application Serial No. 114,785, filed September 9, 1949, in my name.

These and other features of the invention will best be understood from a consideration of the following specification taken in connection with the accompanying drawings in which

Fig. 1 is a front elevation of a machine in which the present invention is embodied;

Fig. 2 is an enlarged vertical section through a swivel in the cement supply connection;

Fig. 3 is a vertical section on a large scale through the nozzle-supporting and traversing mechanism of the machine;

Fig. 4 is a plan view of the traversing mechanism shown in Fig. 3;

Fig. 5 is an angular view of an inverted shoe showing the relation of the nozzle thereto;

Fig. 6 is an end elevation of the mechanism shown in Fig. 3 but with parts broken away;

Fig. 7 is an end elevation of the nozzle viewed from the leaving side thereof;

Fig. 8 is a plan view of this nozzle with parts broken away;

Fig. 9 is an enlarged vertical section of the nozzle taken through the cement supply duct therein on the line IX—IX of Fig. 10;

Fig. 10 is a vertical section on the line X—X of Fig. 9;

Fig. 11 is a similar section on the line XI—XI of Fig. 12 but with the applying fingers of the nozzle resting upon the sole of a shoe; and

Fig. 12 is an end elevation of the nozzle viewed from the forward or leading side thereof and showing a section through a shoe, the sole of which is being coated.

The machine is illustrated as arranged to apply a stripe of cement to the margin 10 (Fig. 5) of the bottom of a platform sole 12 on a shoe 14 having a platform cover 15 and mounted upon a support 16 (Fig. 1) with its bottom uppermost. A coating of cement is applied by a nozzle 20 to which the fluid is delivered through a tube 22 depending from a swivel connection 24 carried in a bracket 26 mounted on top of a post 28. A supply pipe 30 (Fig. 2) leading to a passage 32 in the bracket 26 is provided with a manual shutoff valve 34. The tube 22 passes cement to the nozzle through the central opening of a hollow nozzle-supporting and guiding mechanism to be described. The proper action of the swivel connection 24 is insured by providing the latter with a forked arm 25 which coacts with the reduced

upper end of a rod 27 which is attached to a nozzle supporting device to be described so that there is no undue twisting of the tube 22.

The supporting and guiding mechanism comprises an upper hollow track 36 having a guiding groove 38 (Fig. 3) on its under side and a lower track 40 provided with an opposed groove 42. The upper and lower tracks are held in spaced relation by curved end frames 44, 45 to which they are clamped by bolts 52 and 54 (Fig. 4) at the rear and front of the machine respectively and the hollow assembly is mounted upon shouldered supporting posts 46 which are carried by a base 48. These supporting posts pass through lugs 50, 51 extending rearwardly from the curved spacer frames 44, 45. The tracks 36, 40 are used to guide an endless chain 56 from which the nozzle is supported in depending relation and the design of the grooves 38 and 42 is a composite of right and left soles of an intermediate size taken with the respective toe and heel ends superposed. The chain is made up of a series of incurved links shaped like the letter H turned on its side and comprises tall links 58 (Fig. 3) and short links 60 joined by pivot rods 62, at the top and bottom of each of which are rolls 64 which are received in the guiding grooves. The lower side bars of the tall links have flat end projections 63 (Figs. 4 and 6) which slide on the surface of the lower track 40 just outside the groove and support the weight of the chain, the nozzle and its carrier. One link 65 has one short and one tall end.

The short links 60 are provided with depending drive rolls 66 (Fig. 1) which are carried on lugs 68 extending outwardly from the lower side bars thereof while drive rolls 67 are mounted on pins extending up from lugs on the lower side bars of the tall links. Drive rolls 69 are also provided on each rod 62 between the adjacent links. These drive rolls are positioned to engage the teeth of a sprocket 70 (Fig. 4) carried on a vertical stud 72 which is secured in brackets 71, 73 (Fig. 6) extended to the rear from the tracks 36, 40. This sprocket is driven by meshing pinions 74, 75, the latter of which is at the upper end of a vertical drive shaft 76 supported at its lower end in a bearing 78 (Fig. 1) upon the base 48. Connection to a source of power is effected by miter gears 80, reduction gears 82 and a speed-reducing device 84. The upper ends of the supporting posts 46 are joined by a cross plate 86 upon which there is a socket 88 (Figs. 1 and 3) receiving the lower end of the post 28 which carries the swivel-valve bracket 26 in a position approximately centrally of the hollow tracks.

It will be noted that the links of the chain are curved inwardly and that one of them has a special shape to provide a depending U-shaped support 90 (Figs. 3 and 4) having side flanges 92. This link has upper and lower pairs of guide rolls 64 and the two rolls of each pair are spaced apart so that they will, during their progress around the shoe, maintain the line of outlet holes of the nozzle in a relation substantially normal to a tangent to the periphery of the sole at a point opposite to a point midway between the rolls. Below this support 90 and hung upon pairs of parallel links 94, 96 is a similar U-shaped member 98 having side flanges 100. This arrangement allows the member 98 to move inwardly and outwardly radially of a sole against the tension of a spring 102 (Fig. 1).

The nozzle 20 is supported on a hanger 104

(Fig. 6), (shaped somewhat like a Lorraine cross) which is joined to the member 98 by upper and lower pairs of parallel links 106, 107 thus permitting upward movement of the nozzle against the compression of a spring 108 carried by bent rods 109, 111 (Fig. 3). A carrier 110 for the nozzle is notched to receive the lower end 112 of the hanger 104 and this notched portion is joined to the hanger by a horizontal pivot pin 114 (Figs. 3 and 9). The proper positioning of the band of cement upon the margin of the sole, a narrow clean margin being usually desired, is determined by a guide roll 116 freely rotatable upon a vertical pin 118 in the nozzle carrier. This roll rests against the peripheral edge of the platform sole 12 as shown in Fig. 3. The heightwise position of the nozzle carrier is determined by a roll 120 riding upon the bottom of the shoe and freely rotatable upon a screw pin 122 (Fig. 12) threaded in a thick plate 124 which is a part of the nozzle assembly.

The nozzle 20 comprises a plurality of identical applying fingers 126 having thin mid portions (Fig. 11) to reduce friction and gumming. These fingers are tiltable upon a pivot pin 128 passing between an outer side flange 130 and an inner side flange 132 of a delivery block 134 and these parts 124, 126, 134 together with a frame plate 136 are mounted upon the nozzle carrier 110 by means of screws 138 (Fig. 9). The delivery block 134, and the frame plate 136 have a cylindrical passage to receive a hollow stem 140 projecting laterally from a block 142 into which is threaded a nipple 144 to provide for the connection thereto of the supply tube 22 (Fig. 10). The open end of the stem abuts the carrier 110 (Fig. 9) and a packing 146 received in a groove in the outside of the stem 140 prevents leakage of the fluid cement as the nozzle carrier and the nozzle rock with respect to the stem.

The block 142 and its stem 140 are held in place on the frame plate 136 by means of an outer frame plate 148 joined to the other frame plate 136 by means of screws 150, 151 which pass through spacer sleeves 152. The fingers 126 are urged downwardly, until their transverse portions contact the upper side of the block 134, by means of wire springs 156, the ends of which are wrapped around and thus secured to a cross pin 158 while their free ends are curled at 160 (Fig. 10) and received in grooves in the upper faces of the fingers 126. Displacement of the springs about the pins is prevented by an abutment pin 159 bearing against the mid portions of the springs.

The trailing side 162 of the spacer block 134 is curved about the center of the pivot pin 128 and the forward edge 164 of each finger is similarly curved to rest against this curved face 162. The hollow stem 140 has a vertical slot 166 opposite the center of each finger and in the spacer block 134 a small passage 168 opposite each of these slots communicates with a recess 170 in the inner face of each finger which is joined by a passage terminating in an outlet 172 opening into a groove 174 in the bottom face of each finger. It will be noted that the fingers are lifted against the tension of their springs 156 to conform to the shape of the bottom of the shoe as the height-measuring guide roll 120 determines the spacing of the nozzle as a whole from the work. The motion of the fingers is relatively small and in whatever position they assume within the scope of the apparatus the cement will

flow freely through the passages 168 and out of outlets 172 into the grooves 174 of the applying fingers. It will be noted that each of the individual fingers 126 is provided with a tail 180 to prevent the finger from dropping off the edge of the sole as the nozzle approaches the shank portion as illustrated in Fig. 5 and that these tails also may contact the springs on pin 158 to limit the upward movement.

In the operation of the machine upon a particular shoe which is mounted upon its support 16, the hand valve 34 will be opened if necessary to permit the flow of cement through the swivel connection 24 and the tube 22 to the block 142 and thence through the nozzle fingers onto the work. This nozzle will be carried about such a fractional portion of the periphery of the shoe as is desired and will be guided heightwise by the roll 120 and laterally by the guide roll 116, the latter being held by the spring 102 in contact with the periphery of the sole. As the nozzle rides around the shoe, the individual fingers will yield heightwise as necessary so that they are always in contact with the platform sole 12 and thus may be depended upon to deliver a uniform band of cement through the whole width of the margin 10. The chain which supports the nozzle will hold it in its approximate position by action of the guide tracks 36, 40 and their grooves, the chain being driven by power supplied through the sprocket 70. Inasmuch as the hanger 90 which supports the nozzle by means of parallel links is rigidly integral with one of the links of the chain, then the row of nozzle outlets 172 (Fig. 8) will maintain an approximately radial position with respect to the periphery of the sole. As the nozzle reaches the place where it is desired to stop the band of cement the power delivered to the chain is cut off by the operator and the valve 34 closed.

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

1. Shoe-part coating means comprising a track having the approximate shape of the shoe part, a coating device having a line of outlet openings, a support for said coating device having a pair of rollers guided by said track and spaced a substantial distance apart to maintain the line of openings in a position substantially normal to the periphery of the shoe part, and means for moving said support and coating device along the track to coat the peripheral portion of the shoe part.

2. A device for coating a shoe part comprising a track having a shape similar to that of the shoe part, a support guided by said track at spaced points, a coating device, a hanger to mount the coating device on the support for movement radially of the shoe part, and guiding means on the hanger for engagement with the periphery of the shoe part.

3. A shoe-part coating device comprising a track having a shape similar to that of the shoe part to be coated, a support guided by said track at spaced points therein, a coating device, a hanger therefor, and means for interconnecting the support and the hanger to permit heightwise and radial movement of the coating device, and shoe-part engaging means for determining the position of the coating device with respect to the shoe part.

4. A shoe-part coating device comprising a pair of superposed tracks, a chain positioned between said tracks made up of links joined by pivot pins, rolls on said pivot pins received within the tracks, one of said links being extended downwardly to form a support, a shoe-part coating device, a hanger yieldably mounted on the support to permit heightwise and radial movement of the coating device, and means for guiding the coating device with respect to the shoe part.

5. A shoe-part coating device comprising a hollow track, a support guided for movement around said track, a shoe part coating nozzle yieldably mounted on the support, and a flexible supply pipe passing through said hollow track and connected to the nozzle.

6. A shoe-part coating device comprising a hollow track having approximately the shape of a shoe part, a nozzle for coating the margin of the shoe part, a nozzle support guided by said track, a source of supply of coating material, a flexible tube connected to the nozzle, and a swivel between said source and said tube.

7. A shoe-part coating device comprising a hollow track positioned substantially horizontally, a coating nozzle supported below said track and guided thereby about the periphery of the shoe part, a supply pipe, a swivel joint connected to said supply pipe, a flexible hose extending from said swivel joint to said nozzle, and means on the support connected to the swivel joint to turn with the support.

8. A shoe-part coating device comprising a support for a shoe bottom part, a hollow track positioned above said support, a coating device, a support for said coating device guided by said track, a supply pipe positioned above the track having a swiveled connector, a flexible tube joining said swivel to said coating device, and means for turning the swivel with the coating device comprising a slotted member on one part and a rigid piece joined to the other part and sliding in the slot of the first part.

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