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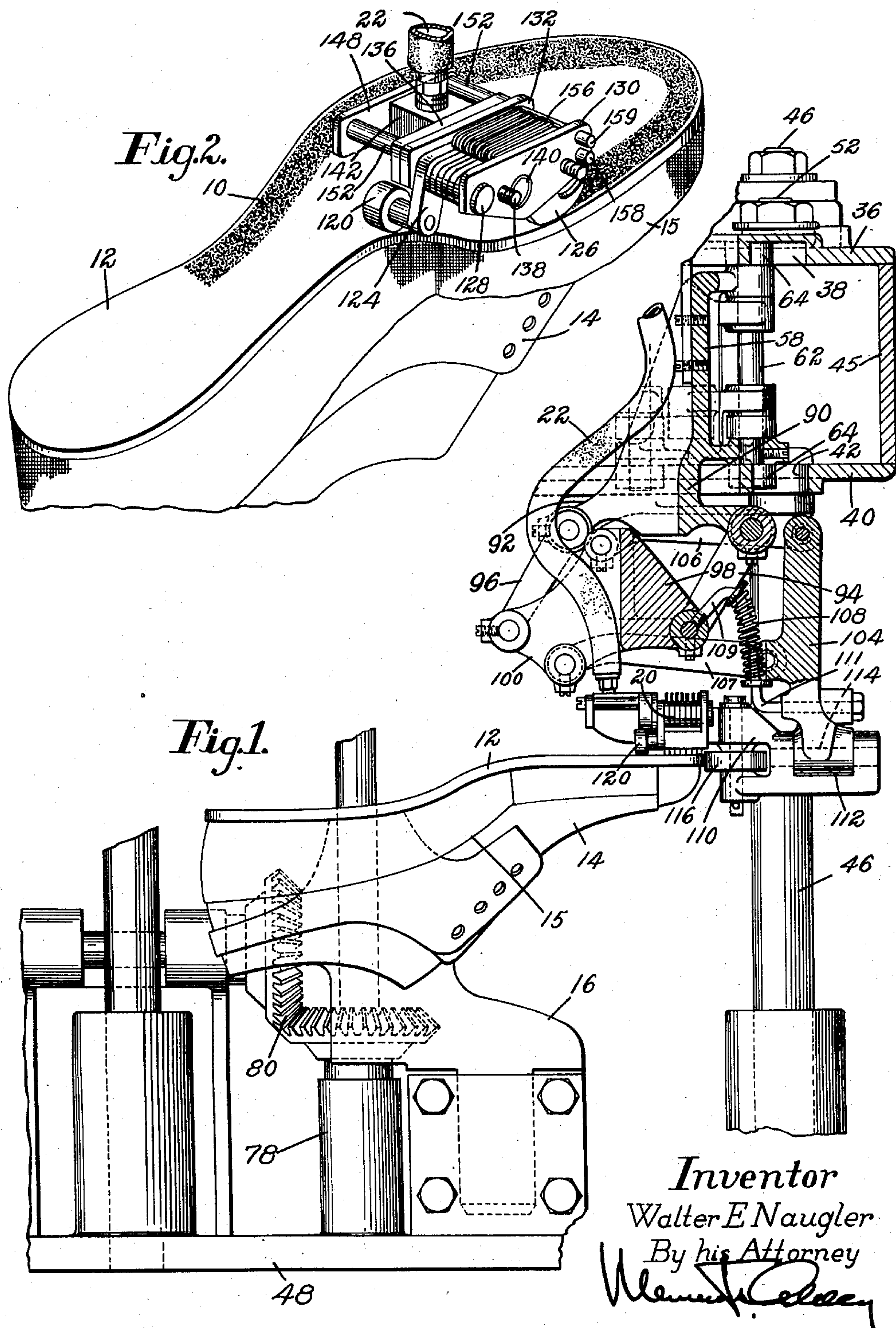
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ARTICULATED NOZZLE FOR SOLE CEMENTING MACHINES

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2,544,173

ARTICULATED NOZZLE FOR SOLE
CEMENTING MACHINESWalter E. Naugler, Beverly, Mass., assignor to
United Shoe Machinery Corporation, Flemington,
N. J., a corporation of New JerseyOriginal application June 23, 1948, Serial No.
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4 Claims. (Cl. 91—12)

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This invention relates to nozzles for coating work pieces such as shoe parts, and is herein illustrated as embodied in a coating nozzle which may be caused automatically to traverse the peripheral margin of a 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, such as that shown in the application Serial No. 34,596, filed June 23, 1948, for improvements in Automatic Machines for Cementing Platform Soles, of which this application is a division, 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 flexible nozzle of simple construction which is arranged to apply a uniform coat throughout the length of the band around the work, even though the work to be treated is of uneven contour.

In order to provide a continuous flow of coating material to the nozzle outlets, in a construction having articulated fingers, my improved nozzle is arranged, in accordance with features of the invention, so that the outlet passage of each finger is always in communication with a supply passage throughout the range of movement of the finger.

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 vertical section through a fragment of one nozzle-supporting and traversing mechanism;

Fig. 2 is an angular view of an inverted shoe showing the relation of the nozzle thereto;

Fig. 3 is an enlarged vertical section of the nozzle taken through the cement supply duct therein on the line III—III of Fig. 4;

Fig. 4 is a vertical section on the line IV—IV of Fig. 3;

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Fig. 5 is a similar section but with the applying fingers of the nozzle resting upon the sole of a shoe; and

Fig. 6 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. 2) 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 from a suitable source, not shown.

The supporting and guiding mechanism of the parent application comprises an upper hollow track 36 having a guiding groove 38 (Fig. 1) 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 such as that shown at 45 to which they are clamped by means including a bolt 52 and the hollow assembly is mounted upon shouldered supporting posts 46 which are carried by a base 48. The tracks 36, 40 are used to guide an endless chain including a link 58. The links of this chain are joined by pivot rods 62, at the top and bottom of each of which are rolls 64 which are received in the grooves. Suitable means for driving the chain may be provided thereby to carry the nozzle around the periphery of the work.

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 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, not shown.

The nozzle 20 is supported on a hanger 104 (Fig. 1), (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. 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. 1 and 3). The proper positioning of the band of cement upon the margin of the sole, a narrow clean margin outside the cement 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. 1. The heightwise position of the nozzle carrier is determined by a roll 120 (Figs. 1 and 6) riding upon the bottom of the shoe and freely rotatable upon a screw pin 122 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 midportions (Fig. 5) 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. 3). 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. 4). The open end of the stem abuts the carrier 110 (Fig. 3) 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. 4) 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 midportions 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 face 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 the curved face 162 and then with a recess 170 in the inner face of each finger which is joined by a passage terminating in an outlet or delivery point 172 opening into a groove 174 in the bottom work-contacting 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 by contact with the work near the point of delivery, as illustrated in Fig. 2 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 cement will flow through the tube 22 to the block 142 and thence through the nozzle fingers onto the work. This nozzle, if used in the machine of the parent application, 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 a spring, not shown, 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. 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. 5) 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.

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

1. A coating nozzle comprising a fixed block having a supply duct adapted to be connected to a source of coating material, yieldably mounted fingers on the nozzle having work-contacting faces and having other faces sliding along a surface of the block, said fingers having passages from said sliding faces to their work-contacting faces, said block having matching passages from the duct to the aforementioned surface of the block adjacent to the fingers, one set of passages being elongated adjacent to the meeting ends of said passages to permit relative movement therebetween without disconnecting the passages.

2. A nozzle comprising a series of fingers mounted on a horizontal pivot and extending laterally therefrom, to permit swinging toward and away from a piece of work, and a block having an arcuate face, a transverse duct, and a series of passages from said duct to the arcuate face, said fingers having curved faces concentric with and meeting the arcuate face of the block and having other work-contacting faces, said fingers also having a series of passages interconnecting said faces, one of said series of passages terminating at said meeting faces in grooves extending in the direction of swinging movement of the fingers to provide a continuous connection between the passages in various positions of the fingers.

3. A nozzle adapted for traversing movement with respect to the upper surface of a piece of work, said nozzle being provided with a horizontal pivot and comprising a block having a transverse duct and an arcuate face upon the trailing side thereof which is concentric with said pivot, said block having passages between the duct and the arcuate face, and a series of flat fingers car-

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ried by the pivot having curved faces adjacent to their trailing ends extending downwardly past said arcuate face in sliding engagement therewith, said trailing ends terminating in work-engaging faces and having passages between said faces which are adapted to be alined with the passages in the block.

4. A nozzle comprising a series of fingers arranged side by side and pivotally mounted for displacement by a piece of work, means for maintaining said fingers in contact with the work, means for delivering coating material to the curved work-contacting faces of the fingers, said fingers having upturned tails the lower surfaces

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of which form extensions of said work-contacting faces to limit the downward displacement of the fingers by contact with portions of the work near the point of delivery.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
2,293,209	MacKenzie	Aug. 18, 1942
2,336,421	Prue	Dec. 7, 1943