

[54] **ADHESIVE APPLYING DEVICE**
[75] Inventor: **Anton Muhlbach**, Frankfurt/Main-Sossenheim, Germany
[73] Assignee: **USM Corporation**, Flemington, N.J.
[22] Filed: **April 28, 1971**
[21] Appl. No.: **138,158**

[30] **Foreign Application Priority Data**
May 6, 1970 Germany.....P 20 22 274.6
[52] U.S. Cl.....**118/410, 141/20.5**
[51] Int. Cl.....**B05c 11/10**
[58] Field of Search118/410, 411, 263; 141/348, 141/18, 20.5

[56] **References Cited**
UNITED STATES PATENTS
3,035,287 5/1962 Vlcek et al.....118/411 UX

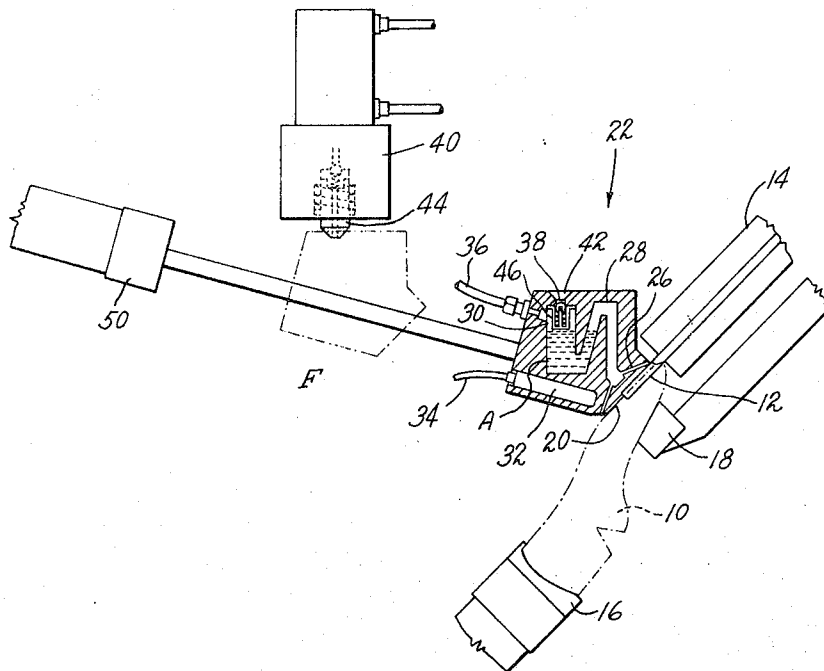
2,972,670 2/1961 Dorosz et al.....118/410 X
3,169,078 2/1965 Baker et al.....118/410 UX
R22,118 6/1942 Lohrey118/263 X
3,422,797 1/1969 Becker118/411

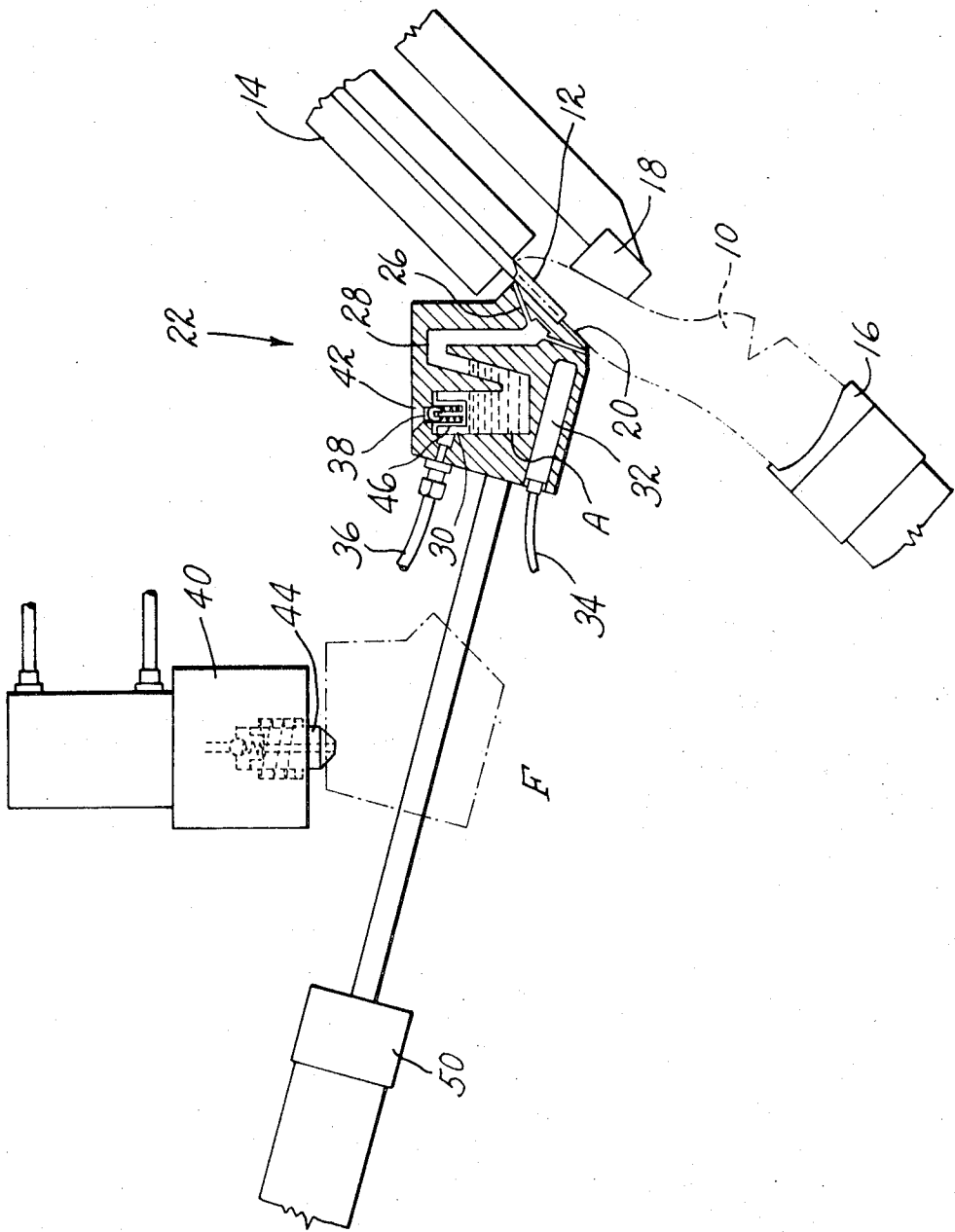
Primary Examiner—John P. McIntosh
Attorney—Richard A. Wise, Richard B. Megley and Howard R. Berkenstock, Jr.

[57] **ABSTRACT**

Apparatus for applying a thermoplastic adhesive to a shoe insole prior to lasting over the upper margin improved by an articulating applicator having nozzle plates for extruding the adhesive on the insole, a reservoir of a one-shot capacity, a compressed air ejection means, wherein the applicator articulates between an application position with the nozzle plate in contact with the insole and a retracted position where the one-shot reservoir is refilled for the subsequent application.

4 Claims, 1 Drawing Figure





Inventor
Anton Muhlbach
By his Attorney
Howard R. Beckenstah, Jr.

ADHESIVE APPLYING DEVICE

BACKGROUND OF THE INVENTION

The invention relates to a device for feeding adhesive to the insole of a shoe in a toe lasting machine. Usually on such machines an adhesive applying nozzle plate is used to direct the placement of cement upon the insole, the plate being moved onto and off of the shoe insole. Normally, the nozzle plate is arranged to advance and retract within a distance of one inch from the insole. A typical lasting machine having such a nozzle plate is disclosed in U. S. Pat. No. 3,422,797 to K. V. Becker, issued Jan. 21, 1969, the nozzle plate appearing therein at reference numeral 60. The adhesive nozzle plate can be brought up to the insole shortly before the lasting operation, where it extrudes adhesive fed to it via a flexible conduit. Immediately after the adhesive application, the nozzle plate is moved back into its rest position. The wiping over of the shoe upper margin then takes place by lasting wipers of the kind usually used on toe lasting machines. An example of such wipers is illustrated at reference numeral 360 in the above identified patent.

The proximity of the adhesive nozzle plate in relation to the insole when the adhesive applicator is in the rest position may be a hindrance if, before the extrusion of the adhesive and the lasting, it is desired to proceed with working operations which are directed toward the insole or the lasting margin. In this case, the adhesive nozzle plate may be in the way of the related processing tools. Among operations of this kind, by way of example, may be the roughing of the lasting margin. In principle, it is possible to impart a further movement to the adhesive nozzle plate, but this involves the complication that the adhesive feed to the nozzle plate must accommodate this movement, and this complication leads to more serious difficulties in adhesive handling. Adhesives are conventionally supplied to a nozzle plate via a flexible hose or tube (illustrated at 116 in FIG. 2 of the above identified patent). In the instance of the metallic hose 116 disclosed in the above reference, insulating means or heating means (304 in FIG. 2) must be provided to maintain the adhesive in a flowable state and at application temperature. Such means further restricts the amount of flexibility of the hose. Further, such flexible devices become easily fouled, inflexible, and subject to breakage upon solidification of the adhesive during a prolonged shutdown and subsequent reactivation of the machine. To increase the capability of movement of the nozzle plate usually necessitates increasing the length of the hose 116, which renders it more susceptible to breakage and more difficult to insulate or heat.

SUMMARY OF THE INVENTION

The basic objective of the invention is to overcome the above difficulties. In accordance with certain features of the invention, an articulated adhesive applying means having a reservoir and an extruder nozzle plate is movable from a retracted position, spaced from the shoe, to an adhesive applying position. The reservoir receives a quantity of adhesive when the applying means is in the retracted position. The applying means then moves to the application position, at which time the extruder nozzle is lying at the appropriate position on the insole. The reservoir then receives an air pres-

sure impulse for the extrusion of the adhesive onto the insole.

Thus, with the applicator according to the invention, adhesive feed through a flexible hose is avoided. By this invention it is possible for the adhesive nozzle plate to execute any required stroke so that in each embodiment there may be sufficient space available in the area of the insole for additional processing operations.

In a preferred embodiment the device for supplying adhesive to the reservoir is equipped with means for union with the reservoir including a nozzle with a check valve, openable solely in the direction of the adhesive feed, and the reservoir includes an elbow-shaped portion connecting it with the extrusion nozzles. The elbow bends off above the normally full level of the cement in the reservoir. By such means the adhesive fed to the reservoir can neither drool backward nor in the direction of the extruder nozzles. Until the compressed air impulse operates upon the adhesive reservoir, the adhesive will not be forced over the elbow and be supplied to the nozzle plate and thereby extruded onto the shoe insole by the nozzles.

DESCRIPTION OF THE DRAWINGS

The FIGURE is a schematic view, in side elevation and partially in section of an adhesive applying device embodying the features of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, reference numeral 10 generally indicates a shoe comprising an upper and an insole mounted on a last. As is common in shoe lasting machines, adhesive is applied to the margin of the insole prior to the shoe upper being wiped over in a conventional manner by wipers 12 mounted in wiper head 14. Shoe 10 may be clamped in the machine by a heel support 16 and held down at the toe area by means 18.

A conventional adhesive nozzle plate 20 such as that illustrated in the aforementioned patent is mounted on an articulated adhesive applying means 22. The adhesive applying portion of nozzle plate 20 is connected through passageways 24, 26 to an elbow-shaped passage 28 which, as may be seen, bends upwardly above the level of adhesive A and then downwardly to connect to the bottom portion of a reservoir 30 within the articulated adhesive applying means 22. The reservoir 30 has a capacity equal to or slightly larger than the quantity of cement necessary for a particular adhesive application. Applicator means 22 may be fitted with heating means 32 such as an electrical heater element connected through leads 34 to an electrical supply source (not shown). The applicator means 22 is also fitted with means for expelling the adhesive A from the reservoir 30 which in the preferred embodiment is via a release of compressed air supplied through a tube 36 connected to a compressed air source (not shown). The applicator means 22 is further provided with a passageway 38 for supplying liquid adhesive to the reservoir 30 from a central reservoir means 40. Passageway 38 is adapted in a preferred embodiment with a funnel-shaped opening 42 complementary in slope to the external contour of an adhesive supplying nozzle 44 of the central reservoir 40. Further, the passageway 38 may be fitted with a check valve 46 to

prevent any escape of compressed air from the reservoir 30 through passageway 38. Central reservoir 40 includes conventional means for receiving adhesive in a solid form either granular or rod-type cement of the type disclosed in U.S. Pat. No. 2,765,768 and means 5 for melting the solid adhesive.

Applicator means 22 is disposed on means for reciprocating it such as the end of a push rod 48, and may be articulated between the applying position illustrated in the FIGURE and the retracted or fill position F denoted by the dotted outline, by a fluid pressure-operated device 50 which may be actuated by known means. The adhesive supplying nozzle 44 may be spring-loaded against a check valve (not shown but known in the art), which may depress when engaged by the applicator means returning to the fill position F such that when the nozzle 44 is fully engaged within funnel 42, the check valve is opened and filling of the reservoir 30 with adhesive A is automatically accomplished.

In operation, the device 50 will be actuated to cycle push rod 48 and carry applicator means 22 from the fill position F to the applying position illustrated. When the applicator means 22 has placed nozzle plate 20 in the appropriate position against the insole of shoe 10, the compressed air supply may be actuated to supply a burst of compressed air through tube 36 to reservoir 30. The press of the air burst forces adhesive A down in the reservoir, up through elbow 28 and then through passageways 24 and 26 to the nozzle plate area 20. At this point the adhesive is extruded through the open area of the nozzle plate 20 and applied to the insole of shoe 10. Applicator means 22 is then cycled to return to the fill position F, depressing nozzle 44 as it approaches the fill position F and thereby filling reservoir 30 with a predetermined quantity of adhesive A sufficient for a subsequent adhesive application. During the retraction cycle of the push rod 48 by device 50, the lasting wiper 12 operates to wipe the shoe upper margin onto the insole of the shoe 10 such that it will adhere thereto by the adhesive just placed by applicator

means 22. Applicator means 22 remains in the fill position F until a subsequent shoe 10 is in position held by heel support 16 and toe support 18 and ready for application of adhesive to the insole of the shoe.

While one embodiment of my invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. In apparatus for lasting shoes, wherein adhesive is applied to the insole of the shoe by means such as a nozzle plate, prior to the wiping over of a shoe upper margin to secure said margin to said insole, the improvement comprising: a movable adhesive applicator means including a reservoir for containing a quantity of adhesive suitable for subsequent application to said insole, nozzle means on said applicator having extrusion channels therein, conduit means between said reservoir and said extrusion channels, means for articulating said applicator means between a retracted position and an extrusion position, means for ejecting said adhesive from said reservoir through said conduit means to said extrusion channels while said applicator means is in said extrusion position, means for refilling said reservoir with a quantity of adhesive while said applicator means is in said retracted position, and an elbow-shaped chamber disposed between said refilling means and said conduit means, the vertical extent of which extends above the level of adhesive in the reservoir-filled condition.

2. The improvement according to claim 1 including means for maintaining adhesive of thermoplastic type in a fluid condition.

3. The improvement according to claim 1 wherein said ejection means includes means for supplying a burst of a compressed gas.

4. The improvement according to claim 3 including check valves in at least one of said gas ejector means and said filling means whereby backflow of adhesive to said filling means is avoided.

* * * * *

45

50

55

60

65